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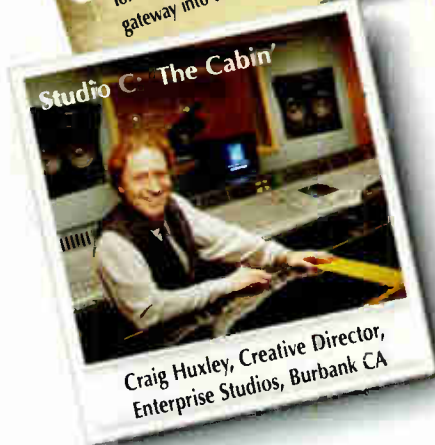
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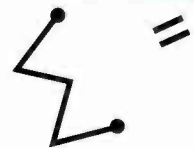


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MAY 1999, VOLUME 23, NUMBER 5

## AUDIO

- 20 **The Fast Lane:** Abusing the Art of Recording Guitar  
*by Stephen St. Croix*
- 24 **Insider Audio:** George Martin—Doing It on the Road  
*by Paul D. Lebrman*
- 76 **Recording Guitar:** Three Engineers Reveal Their  
Tips and Tricks *by Barry Cleveland*
- 88 **The Mix Interview:** Blondie *by Blair Jackson*
- 100 **International Update**
- UK Live Sound Companies in the U.S. Market  
*by Chris Michie*
  - Colin Fairley and Helioscentric Studios  
*by Barbara Schultz*
  - Facility Spotlight: Rockfield Studios  
*by Barbara Schultz*
- 116 **Mix Masters:** Kevin Killen *by Maureen Dronney*
- 132 **Top-of-the-Line Noise Gates:** An Open and  
Shut Case *by Chris Michie*
- 196 **Recording Notes**
- Dolly, Emmylou and Linda Make More Heavenly  
Music *by Robyn Flans*
  - The Barenaked Ladies' "Stunt" *by Paul Myers*
  - Classic Tracks: Genesis' "The Lamb Lies Down on  
Broadway" *by Tim Morse*
  - Cool Spins: The Mix Staff Picks Some Favorite CDs



PAGE 146



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PAGE 88

## STAR WARS SPECIAL

- 33 **Finishing the Phantom Menace—The Complete  
Post-Production for "Star Wars: Episode I"**  
*by Larry Blake*
- 58 **The Link Between Picture and Sound:** ILM,  
Digital Dailies and the Avid Edit *by Larry Blake*
- 66 **Music for the Menace:** John Williams and Shawn  
Murphy With the London Symphony Orchestra  
*by Larry the O*

## LIVE SOUND

- 176 **Marilyn Manson and Hole:** The Tour That Never Was  
*by Anne Eickelberg*
- 182 **Loudspeaker Trends:** The State of the Art in System  
Design and Manufacturing *by Mark Frink*
- 183 **Tour Profile:** Lauryn Hill *by Sarah Jones*
- 184 **All Access:** Tom Petty & The Heartbreakers  
*by Steve Jennings*
- 194 **New Sound Reinforcement Products**

## PRODUCTS

- 138 Preview/Hot Off the Shelf**
- 142 New Hardware/Software for Audio Production**
- 144 Technology Spotlight:** Mackie Pro Touring Speakers *by George Petersen*
- 146 Field Test:** Soundtracs DPC-II Large-Format Digital Mixing Console *by Larry the O*
- 154 Field Test:** Ashly Protea 24-bit Digital EQ *by Mark Frink*
- 158 Field Test:** DACS MicAmp *by Elliott James*
- 160 Field Test:** Sundholm Acoustics SL6.5w/s Studio Monitors With Stereo Subwoofer *by George Petersen*
- 166 Field Test:** CLM Dynamics DB500s Expounder Stereo Dynamic Equalizer *by Barry Rudolph*
- 170 Field Test:** dbx DDP Digital Dynamics Processor *by Michael Cooper*
- 174 Technology Spotlight:** TC Works Spark Digital Audio Mastering Editor *by George Petersen*



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PAGE 183



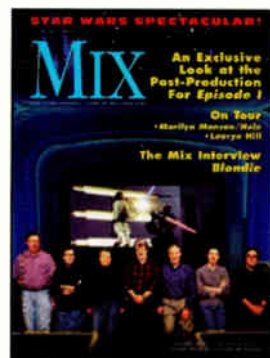
PAGE 76

- 256 Power Tools:** Audio Precision Portable One *by John Klett*

## DEPARTMENTS

- 8 From the Editor**
- 10 Feedback**
- 12 Current**
- 16 Industry Notes**
- 210 Coast to Coast** (Includes L.A. Grapevine, NY Metro Report, Nashville Skyline, and Session & Studio News)
- 218 Studio Showcase**
- 224 Ad Index/Product Info Card**
- 232 Marketplace**
- 237 Classifieds**

Cover: The core sound crew of *Star Wars: Episode I—The Phantom Menace*, pictured, L to R, in front of the Capricorn in Skywalker Sound's Mix A: Re-recording mixers Shawn Murphy and Gary Rydstrom, supervising sound editor Tom Belfort, director George Lucas, film editor/supervising sound editor Ben Burt, co-supervising sound editor Matt Wood and re-recording mixer Tom Johnson. Our coverage begins on page 33. Photo: Steve Jennings. Art Direction: Tim Gleason.



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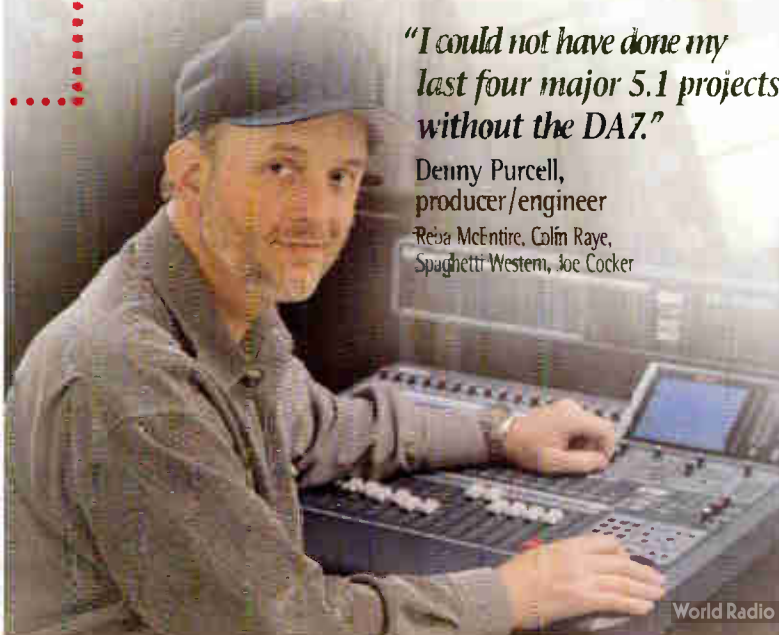
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# FROM THE EDITOR

## THANKS, GEORGE!


Sixteen years after *Return of the Jedi*, the magic is back. And as part of our exclusive reporting on *Star Wars: Episode I—The Phantom Menace*, we're breaking the tradition of our typical *Mix* cover to spotlight the audio team of Ben Burt, Gary Rydstrom, Tom Johnson, Shawn Murphy, Matt Wood, Tom Belfort and...George Lucas. Perhaps no one in the past quarter-century has advanced the cause of motion picture sound more than George Lucas. Realizing the importance of the picture/sound relationship since his early days, Lucas' projects have set new standards in aesthetics and technology. *American Graffiti* pioneered the use of source music playing as score, while *Star Wars* revived the majestic orchestral score in an era when electronic film music was the rage. And as Hollywood began outsourcing, Lucas began investing, creating cutting-edge facilities such as Industrial Light & Magic, LucasArts and Skywalker Sound, affectionately dubbed "The Ranch." Lucas was also quick to develop new technologies, including the refinement of motion control cameras and blue screen systems; the 1985 launch of SoundDroid (the first advanced digital audio workstation); long-distance transfers of AC-2 encoded audio sessions over T1 phone lines in 1991; and taking a leading role in computer-generated effects/characters, culminating in Jar Jar Binks, a main CG character in *Phantom Menace*. The prequel will also be the first major studio release to be exhibited using DLP Cinema™ (filmless digital projection) in five U.S. cities.

Lucas' decision to release *Star Wars* in Dolby Stereo in 1977 was a major factor in helping the then-fledgling format gain universal acceptance. The days of expensive, fragile mag-striped 35mm stereo prints were over, replaced by low-cost (and mono-compatible!) Dolby-matrixed LCRS optical soundtracks. Audiences—most of whom had never heard stereo film—were delighted with the experience, and the number of Dolby Stereo theaters skyrocketed. The Dolby Stereo encoding on feature films remained intact on video releases, giving rise to the home surround theater revolution.

Throughout it all, Lucas has voiced a concern for playback quality, exemplified by the founding of THX in 1983 to ensure that audio reproduction in theaters be maintained at the highest possible standards. The THX program began with designing and specifying high-performance loudspeakers and playback electronics. Later, THX offered performance certification for theaters, dubbing stages and home/pro products, while the Theater Alignment Program (TAP) provides quality assurance spotchecks at THX-certified venues. More recently, Dolby and Lucasfilm THX have teamed up to launch Dolby Digital Surround EX, a 6.1 release format (essentially 5.1, but with a matrixed center-rear surround track) that debuts with *Phantom Menace*.

This summer, millions of viewers worldwide will tingle with anticipation as the house lights fade, the curtains part and *Star Wars: Episode I—The Phantom Menace* hits the screen. Few moviegoers will be talking about TAP, 6.1, Foley, DAWs or Decca Trees as they leave the theater, but it's a safe bet that they will have been touched by the magic of George Lucas and his team.

Pass the popcorn!



George Petersen



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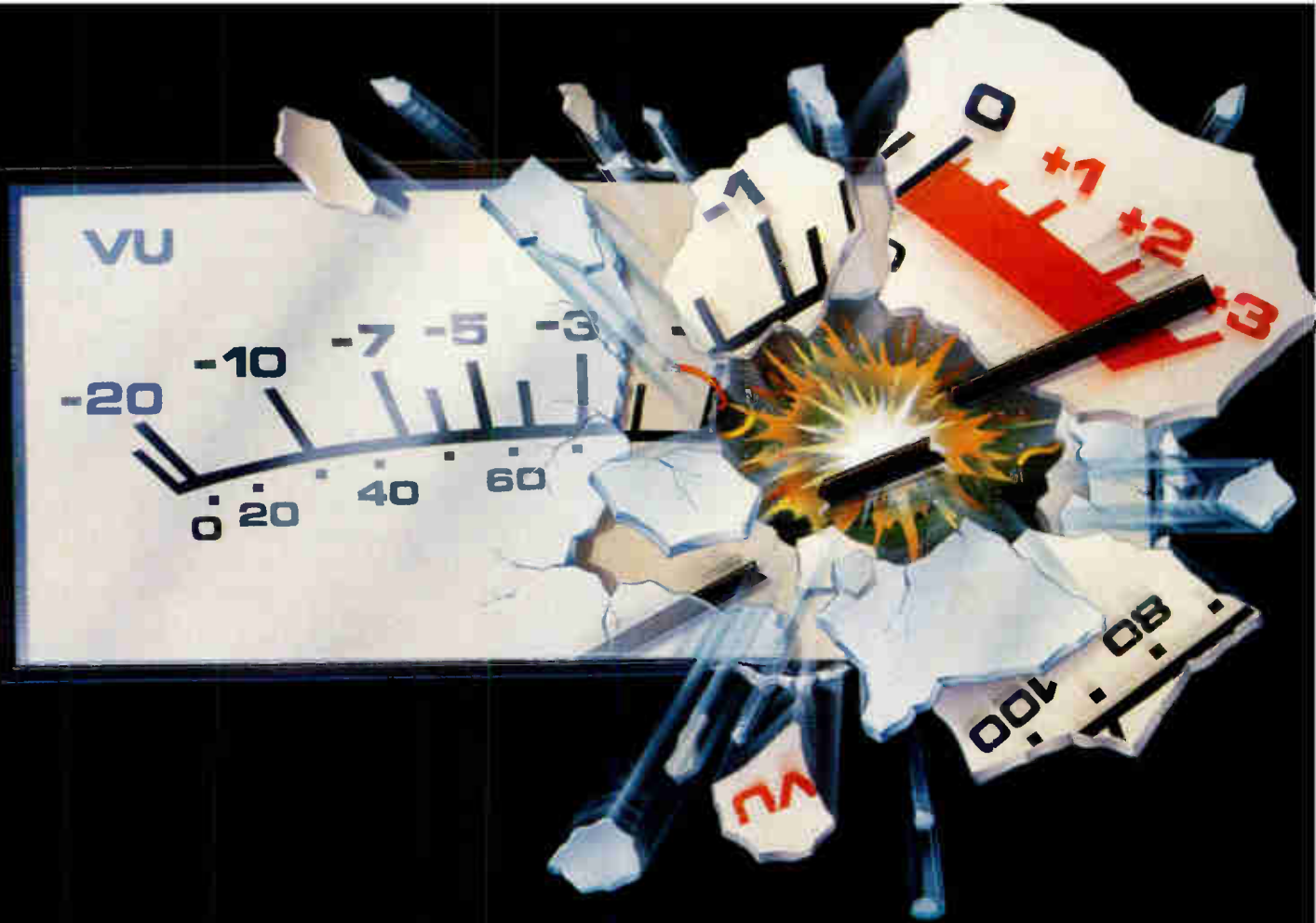
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# FEEDBACK

## THANKS FROM THE PROJECTS

I have been an electronic musician since 1983. I have been reading the trades for about as long, and when I read the Project Studio Design article in your February 1999 issue, I finally felt like I'd learned something. I was glad to read this article in *Mix*, a top-of-the-line and state-of-the-art magazine.

The article was very informative and very simply stated. I have a small room here in the San Francisco Bay Area, and I know the acoustics are terrible. The author [Bob Hodas] provided easy methods for improvement and cheap solutions that I know will work. I was surprised that some methods explained, though simple, made so much common sense that I feel confident in testing other studios that I go to with these methods. Thanks for doing a great job.

*Kanyon Marcell*

## AURATONES FOREVER!

As a longtime audio industry pro, I read with interest the November 1998 Insider Audio "My Favorite Vintages" (my November issue got filed before I read it, until today). I had to comment on your reference to your Auratone speaker set.

I worked at an 8-, then 16-, then 24-track studio through much of the '70s and '80s. The owner/engineer bought a pair of standard Auratones after hearing them as alternative "radio-mix" monitors in another studio. He set his pair on modified desk mic stands on the edges of his console so he could rotate them for optimum direction, mix after long sessions at lower volumes and perform "reality check" mixes, A/B-comparing them with his high-end JBL monitors. The midrange clarity on these little things always held up.

Clients got to be so impressed with the performance of the "mini-monitors" that the studio became a dealer just to sell to recording clients! This was before people started using "near-field" setups so widely, and these small, clear monitors were something of a novelty. When the studio became an Auratone dealer, I could buy them at a discount, and I ended up with one of just about every model they made. They not only made the standard wooden cubes and the

"road" packages that locked together as a travel case (these were 5RCs, actually), but there was also a 5S model in a little larger cabinet for extended bass response. I still have my "road cubes" and the 5S larger cabinet set. I sold my others to friends and family who continue to use them (I think one set was finally "weathered out" on my parents' Sportfisherman).

My final comments are in response to your assertion that "today, most television speakers...sound better than these (Auratones)." I think mine still possess uncanny reproduction qualities, frequency response issues notwithstanding, and I wish more consumer multimedia would concentrate on quality midrange reproduction instead of this high/low, tweeter/woofer/subwoofer exaggeration paradigm.

Anyway, that's my two cents' worth. Best regards and keep up the great publication work (I enjoy St.Croix a lot, too).

*Bob Watson*

*Telemedicine Technologies Company*

## SOME PEOPLE PREFER TO GO BOTH WAYS

In talking to a representative from Studer, I was informed that the company is going to discontinue production of the 827 multitracks in the near future. Although old machines would still be serviced, and 2-tracks would be produced for some time, that would be the end of Studer's analog multitracks. I realize that analog recording doesn't dominate the industry like it once did, nor should it, but I believe it would be a shame for it to die off completely. I am all for the newer technologies, but I feel as many people do that this medium has its place.

Digital is an excellent storage medium, but there are many instances where analog can add color and life to a sound, whether on a mix or on bed tracks. Many people feel now that analog is just for old people who can't handle the future, but I'm in my 30s. On a lot of occasions, I have done mixes for younger people from digital to analog, and they were quite astonished at what they heard (and this was just on a Tascam 32!). My fear is that most people's

exposure to analog now is their home cassette player, and they have no idea how it can really help their sound. Although it's not for every situation (classical music, etc.), in my opinion it certainly has value for many types of music recording.

I have the feeling that a great number of people are beginning to believe that something that comes in the form of 0's and 1's is automatically better, and if something is kept in that format from microphone to home speaker it will always be preferable. This might be the desired way for many instances, but it can be short-sighted. Music recording to me is about getting the sound that you desire, not following some type of purist philosophy or procedure. In the bombardment of new digital technologies, some good some bad, I am beginning to think this may be forgotten. I am sure others out there must feel as I do.

The old Studers were built like tanks, but someday someone is going to have to buy a new one. If there is enough of a demand, I'm sure someone should be able to build and sell these machines at a profit. I think the introduction of new technologies has made the old technologies sound and work much better; there's no reason why we can't have both. They complement each other if used creatively. It would be a shame not to have these extra colors to work with. Music is art, not science, and although analog might not be as accurate in its reproduction of the original source, it can add color and warmth, whether it be from tape, tubes or some other type of circuit.

*Danny Jefferies*

*Hamilton, Ontario*

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World Radio History



# CURRENT

## PRG BUYS A-1 AUDIO, ELECTROTEC

Production Resources Group has purchased A-1 Audio & Lighting Productions (Westlake Village, Calif.). This acquisition closely follows PRG's buy-out of sound company Electrotec in March, completing a hat trick of West Coast sound company acquisitions and continuing its roll-up of event production services. Though no major changes are planned, the structure, offices and personnel of the combined efforts of A-1, Electrotec and ProMix West (formerly known as Burns Audio) were still evolving at press time.

Says Lew Mead, president of the PRG Audio Group, "Our depth—in geography, personnel and areas of expertise—is now revolutionary. Our group consists of companies that are the leaders in audio for special events, corporate, theater, concert touring and on Broadway. We no longer do a lot of this and a little of that; we can truly handle events in any market with the very best in equipment, personnel and service."

A-1 was founded in 1969 by Albert V. Siniscal as an outgrowth of his work for early 1970s tours with the Righteous Brothers and the Doobie Brothers. With locations in Hollywood, Santa Monica, Las Vegas, Lake Tahoe, Branson, Mo., and New York City, the company has enjoyed enormous success. Siniscal was positive about the acquisition, saying, "We are proud to be part of the PRG Audio Group. We will now be able to provide service for the next 30 years as we have in the past 30 years."

A-1 Audio joins ProMix and Electrotec in PRG's Audio Group, while the company's lighting services will become part of PRG's Lighting Group. Tom Sorce, A-1 Audio CEO, was enthusiastic as well. "On Monday, April 6, PRG acquired A-1 Audio Inc., forming the largest performance audio company in the world," Sorce says. "The PRG Audio Group now has an unprecedented ability to provide service and technical support for clients."

A-1 Audio summer tours include Offspring, Aerosmith, Motley Crue and Chicago. Electrotec has been out with Bob Dylan, Rod Stewart, Lenny Kravitz, Tom Petty and Marilyn Manson, with

Elvis Costello scheduled for June. ProMix West projects include the Academy of Country Music Awards, along with studio tapings of *Jeopardy*, *Wheel of Fortune* and the *Cher Show*.

ProMix in New York was acquired by PRG in January 1998, and the company continues to provide sound for Broadway productions and special events. West Coast PRG lighting divisions are Production Lighting Systems, Light & Sound Design and Production Arts in L.A., and Cinema Services in Las Vegas. On the East Coast are Production Arts in New Jersey, Vanco in Orlando and Lighting Technologies in Atlanta.

—Mark Frink

## IVOR DRAWMER RECEIVES LIFETIME TECHNICAL ACHIEVEMENT AWARD

The UK's Association of Professional Recording Services (APRS) honored Ivor Drawmer with the coveted Award for Lifetime Technical Achievement to the Audio Industry. The award is in recognition of Drawmer's influential contribution to pro audio design over the past 20 years.

"Ivor's designs have not only played a significant role in the way that signal processing has evolved, but have also shaped the product ranges of our competitors," says Ken Giles of Drawmer.



Ken Giles (L) and Ivor Drawmer

"His past achievements with analog circuitry and his presence at the leading edge of 24-bit 96k digital processing illustrate his versatility and make him a unique technical figure in our industry."

## CCS SHUTS DOWN INTERNET PIRATE SITES

Copyright Control Systems, a UK company dedicated to reducing copyright abuse of software, with particular focus on the Internet, announced that in its first six months it worked with Internet service producers around the world to remove more than 1,000 Internet sites offering pirated, unlicensed or "cracked" versions of CCS members' audio software for download.

Managing director Dave Powell said,

—CONTINUED ON PAGE 16

## STUDIOPRO99 ANNOUNCES PANELISTS, SPONSORS

*Mix* will present StudioPro99, a two-day conference on the technology and business of recording, June 14-15 at the Universal City Hilton in Los Angeles.

Ten panels and forums will address the technologies, formats and new applications that will shape recording and sound production in the 21st century. The conference will focus on topics including "Audio Production for the Web," "DVD-Audio and Super Audio CD," "Sound Design for Interactive Entertainment" and "The Hybrid Workspace: Integrating Consoles and Workstations."

Participating moderators and panelists will include Al Schmitt, Shawn Murphy, George Augspurger, Vincent Van Haaff, Ed Cherney, David Reitzas, Jeff Rona, Don Gehman, Denzil Foster and many more experts in audio technology, disc mastering, acoustics and studio design, and audio production for new media.

The conference is sponsored by Dolby Labs, Quantegy, Alesis, Audio-Technica, Genelec and Mackie Designs. To receive a StudioPro99 brochure and registration materials, call Julie Shandrew at 510/653-3307, ext. 3242, or e-mail StudioPro@intertec.com. ■



*Lucas Digital's Skywalker Sound, Marin County, CA*

# The Force Is With Neumann

Skywalker Sound knows multichannel audio. And to get unreal sound for movies like *Star Wars: Episode I – The Phantom Menace*, *Titanic* and *Saving Private Ryan*, they have to start with VERY real sound. Their choice of microphones? Neumann, of course.



From the award-winning M 149 Tube (pictured) to the giant-killer KM 184, Neumann mics capture everything from the complexities of a film's score to its most intimate, critical dialog. When it's time for the real thing, be ready with Neumann.



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# EUPHONIX INTRODUCES THE NEXT INNOVATION...



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network and 24-bit 24/96k recorder

### Coming soon to a studio near you

#### Highest Sound Quality

24-bit, premium converters,  
40-bit DSP

#### Modular and Expandable

Open architecture supports future  
I/O options, sample rates,  
machine control, track expansion,  
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#### Reel Feel™

Familiar tape-style remote and  
transport feel

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No fear of erasing tracks,  
multiple takes per track, records  
hundreds of tracks, plays any  
combination of 24 tracks

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Rugged construction, premium  
components, fault tolerant design

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No head wear or media  
degradation during repeated use,  
long shelf-life media

#### Recording and Editing

24-track punch in/punch out, no  
need to transfer to an editor for  
basic edits

#### Random Access

No waiting for locates, ultra-fast  
looping

Web site: <http://www.euphonix.com>

CIRCLE #007 ON PRODUCT INFO CARD

# INDUSTRY NOTES

Scott Emmerman was promoted to VP of domestic sales and marketing at Emu-Ensoniq (Scotts Valley, CA). Emmerman joined E-mu Systems in 1993 as Western sales manager; before that he spent 13 years at Roland Corporation working as a guitar demonstrator and Southeastern sales representative... Ian Thacker was appointed general manager of Klark Teknik Group USA (Buchanan, MD). Thacker was formerly a regional sales manager for Community Light and Sound... Otari Corp. news: Chris Steinwand was named documentation marketing manager; he'll be responsible for coordination of Otari's tech support documentation and maintenance of the company's Web site. Jim Rogers, formerly with Starstruck Studios, was hired as senior service technician. Dana Hathaway was brought onboard as product specialist... Quantegy Inc. closed its Peachtree City, GA, offices and relocated all headquarters staff to the company's production facility. The new address is 2230 Marvyn Parkway, Opelika, AL 36801; mail can also be sent to P.O. Box 190, Opelika, AL 36803-0190... Renkus-Heinz Inc. (Irvine, CA) announced the appointment of Christian Doering as director of marketing. Doering previously worked for EAW... David Schwartz, who co-founded *Mix* in 1977 and was the editor-in-chief for 18 years, was appointed director of industry relations at Ex'pression Center for New Media (Emeryville, CA)... HHB Communications USA moved its offices into a 6,000-square-foot facility. The new address is 1410 Centinela Ave., Los Angeles, CA 90025-2501. The phone and fax numbers remain the same. HHB also announced two new dealer representatives: Plus Four Marketing (Concord, CA) and Murphy & Cota (Norcross, GA)... Alesis Corporation (Santa Monica, CA) announced that Arnd Kaiser was promoted to international marketing manager. Kaiser will continue to work from his office

in Wiesbaden, Germany... Joel Silverman resigned his position as Lexicon's VP of North American Sales to join Nashville, TN-based JamSync. Silverman will be responsible for sales and marketing communications... Sweetwater Sound (Ft. Wayne, IN) update: Greg Baitz was appointed technical training coordinator; Matthew Craig, Spiro Theofilatos and Bill Thompson were brought onboard as sales engineers. Additionally, Sweetwater was recently named 1998 regional Dealer of the Year by Neumann... Digigram Inc. (North American headquarters in Arlington, VA) announced that Paul McClellan and Joel Rasmussen were hired as business development managers. Both will concentrate on establishing new U.S. partnerships for the company beyond its focus on radio. Meanwhile, at corporate headquarters in Montbonnot, France, founders Philippe Girard-Buttoz and Marian Marinescu handed over day-to-day management duties to Gerard Santraille and Neil Glassman... TEC:ton Engineering (Los Angeles), a division of studio bauton, appointed Andy Wild general manager. John Hanes was promoted to project manager. Bernard Reeve was appointed engineering manager and Claris Sayadian was hired as marketing and public relations manager... Fairlight USA (Culver City, CA) announced that Matthew Weiner was appointed senior product manager for the Eastern region, to be based in the company's New York office... Lisa Hankins was promoted to sales administration manager at Minneapolis-based Telex Communications Inc... API Audio (Springfield, VA) joined forces with Transamerica Audio Group. Transamerica will be API's exclusive U.S. distributor, providing marketing, advertising and public relations... Fred Perez was appointed vice president of sales and technical marketing for Microtech Systems' (Belmont, CA) line of CD-R and DVD production systems. ■

—FROM PAGE 12, CURRENT

"To get an idea of the economic effects of our actions, imagine that we had left 250 Internet sites up and running which were posting 'cracked' software for six months. Let's say that each day, one piece of software valued at, for instance, \$300 was pirated from each of these 250 sites by someone who would otherwise have bought this software. Over six months, the value of software stolen this way would amount to around \$13.5 million. If you now consider these figures are conservative estimates, you can easily see how CCS's actions are preventing a significant amount of economic damage. We've proved that CCS is able to do in a remarkably short time what everyone said would be impossible.

Besides shutting down Internet pirate sites, CCS provides antipiracy information through the trade press and trade organizations.

For further information and updates visit [www.copyrightcontrol.com](http://www.copyrightcontrol.com).

## LIQUID AUDIO FOUNDER STEVEN HOLTZMAN, 1956-1999

Steven Holtzman died at his Woodside, Calif., home of cancer at age 43. Born in Great Neck, N.Y., Holtzman became an accomplished musician, and he received a doctorate in music and computer science from the University of Edinburgh in Scotland when he was 24 years old.

While at Edinburgh, he directed the first electronic music festival held in conjunction with the annual Edinburgh Festival. A frequent adviser to start-up companies, Holtzman founded Perspecta in San Francisco, Liquid Audio in Redwood City and Optimal Networks in Mountain View. He also held executive positions with Radius, Farallon and Wycse Technologies and was a member of the board of advisers to Motion Factory. Holtzman was a frequent writer and contributor for public radio and other news media on the subject of digital media.

## CORRECTIONS

"On the Cover" in our March issue featured New York City's Quad Recording, but we failed to mention that there are three identical Dynaudio/Munro M4+ four-way active monitor systems at Quad, used in the two SSL 9000J rooms and in the new SSL Axiom-MT room. In addition, in the Classic Tracks section of Recording Notes, we printed that Bernie Grundman mastered the Blondie album *AutoAmerican*. The mastering engineer on that project was actually Steve Hall. *Mix* regrets the errors. ■



# This will be the most imitated speaker on the market.

## Again.

Eighteen years ago, Meyer Sound rocked this industry by introducing the most sophisticated loudspeaker yet--The UPA-1 featuring the first trapezoidal cabinet (US patent # 271,967) and the first professional loudspeaker with dedicated control electronics\*. It was eventually imitated by almost every other loudspeaker manufacturer.

Today, the Self-Powered UPA-P radically improves upon its classic predecessor by perfecting every aspect of loudspeaker design: High SPL, low distortion, high efficiency, linear response, precise coverage, consistent performance, and unbeatable convenience.

*The new UPA-P is a revolution. Only the progressive thinking and uncompromised engineering of Meyer Sound could produce a system this powerful, this flat, this compact.*

Flat phase response +/- 35 degrees from 600Hz to 16 kHz. Great response for a studio monitor, unheard of in a high power PA product.. until now.

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A new constant directivity CQ™ horn, the culmination of years of research in our own anechoic chamber, guarantees the most accurately defined high-frequency coverage (Pat. pend.)

Only 77lbs total weight.

An Intelligent AC™ system that automatically adjusts to the operating AC line voltage from 80 to 265 VAC.

CE and UL Approval.

Do the math. The Self-Powered Ultra Series is surprisingly affordable and costs substantially less than conventionally amplified systems.



## UPA-1P

The Self-Powered Ultra Series

*You owe it to yourself  
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\*John Meyer holds numerous patents including a low distortion driver/horn combination which is utilized in the UM-1P, and one for the perfectly aligned phase response through crossover (zero-pole crossover) utilized in both the UPA-P and UM-P.

World Radio History



## MICHAEL DeLORENZO



Double threat **Michael DeLorenzo's** acting credits won him a role on "NY Undercover"... his musical gifts landed a recording deal. "The sound of this console is as good as any big analog console I've worked on," he says, adding "My producer **Peter Michael** and I were so surprised by the quality of the onboard dynamics and reverb that we plan to mix the whole album without outboard gear."

## WHY GO DIGITAL?

Virtually everybody in this ad has worked on a Big Automated Analog Console. Motorized faders... instant recall of channel, aux, EQ and effects settings... the ability to polish every facet of a mix... It doesn't take long to get used to the fantastic creative benefits of automation. Now, at a tiny fraction of the cost of those Mega-Consoles, a whole new breed of affordable digital consoles promises the same automation convenience. Our Digital 8-Bus not only delivers better-than-big-console automation, but it's intuitively easy to use, and it has a warm natural sound—while maintaining the pristine sonics of 24-bit digital. **CALL OR E-MAIL FOR A FREE VIDEO AND THE NAME OF YOUR NEAREST DEALER... AND FIND OUT WHY YOU SHOULD GO DIGITAL WITH MACKIE.**

## LEE ROY PARNELL



**Lee Roy Parnell's** upcoming Arista album may start a new trend in artist-producer-label communication. At every stage of each song's progress, mixes get modemed between Parnell's studio, producer **Ed Cherney** in Los Angeles, and Arista-Nashville president **Tim Dubois'** Nashville office on Music Row. (This won't make the airline industry too happy.)

## POKE



**Poke** (above) and co-creator **Tone's** credits include "Allure," Will Smith's "Big Willie Style" album, and NAS' "It Was Written." Their opinion of our new digital mixer? "Making records on the D8B is for real. Tight mixes and we love not having to give up the bread it used to cost to get great sound."

## MAD JEF



**Mad Jef's** platinum credits include engineering and programming for the likes of Michael Jackson, Janet, Jam & Lewis, and Grammy winners Sounds of Blackness. Jef didn't expect much from the D8B's processing. His opinion after several mixes? "The onboard effects are so good I'm getting rid of a bunch of outboard gear."

## NAUGHTY BY NATURE



**Naughty By Nature** cut and mixed the platinum "Next" on their analog 8-Bus, so buying a D8B to mix their new release "19 Naughty IX" was a no-brainer. NBN's KG says the band avoided other digital mixers because they "mess with your sound."

TOTAL CONTROL. TOTAL CREATIVITY. AND DID WE MENTION...

# SUPERB SOUND

MUSCLE SHOALS  
CITY LIMIT

"Sounds as good as an expensive analog console." We hear it over and over. From seasoned recording veterans. From new, emerging talent. Though musically diverse, the folks in this ad all have one thing in common: highly-tuned BS filters. If the Digital 8•Bus didn't deliver, they wouldn't be using it. Call or e-mail for a free video and the name of your nearest Mackie Digital Systems dealer. Get an in-depth D8B demo and prove it to yourself: Mackie's Digital 8•Bus simply sounds superb.

WALTER AFANASIEFF



JIMMY JOHNSON



You'd think with more than 100 million album sales to his credit, we could have treated pop producer **Walter Afanasieff** better. But even his dazzling production credits and deposit at a local retailer couldn't land him a D8B until recently. Was the 9-month wait worth it? As Walter's engineer **David Gleason** says (in his inimitable British accent): "Walter and I both really love this desk."

Few know the evolution of recording better than Muscle Shoals legend **Jimmy Johnson**. He engineered hits for Otis Redding on a big-knob mono console, did the Stones' "Brown Sugar" on the first 8-track, produced Lynyrd Skynyrd on 24-track, and is now one of the first to own a Mackie D8B. Johnson says, "The sound I'm getting out of this console is phenomenal. Why did I have to wait so long to get it?"

ARROWHEAD STUDIOS



Virgin/Nashville President/CEO **Scott Hendricks** has produced over forty #1 records. His newest commercial recording facility is built around a pair of Mackie D8Bs. With a 48-track Sony, 24-track RADAR, oodles of outboard gear, and Pro Tools 24 on hand, Arrowhead Studios' double-D8B 144-channel Mackie rig gets a serious digital workout.



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CIRCLE #008 ON PRODUCT INFO CARD



# ABUSING

## THE ART OF RECORDING ELECTRIC GUITARS, PART 1

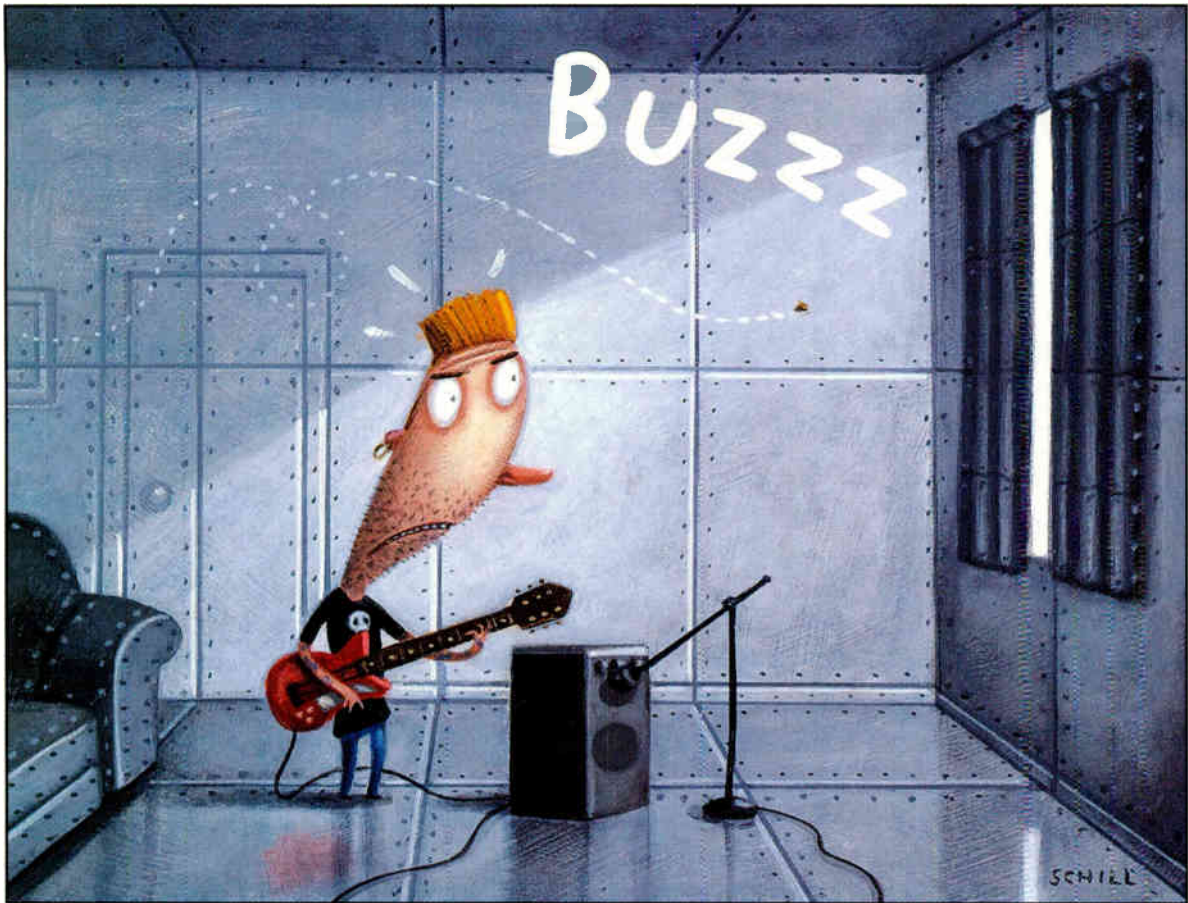


ILLUSTRATION: GEORGE SCHILL

I guess I'll get the basics out of the way immediately. You won't find any advice from me here on what mics to use, how loud to play, how to compress or how to EQ. Most of you already know this stuff, and new views exist elsewhere in this very issue. And I'm not going to give you *any* general tips on dealing with guitar amps—everybody else can (and will).

What you *will* find here is freaky information concerning extreme alternative approaches that I have used in studios around the world to get the results I wanted. Fringe stuff. Some of it will get you obvious changes, while others will produce very subtle but fascinating and unique additions to your current repertoire.

You will also find that this is a two-part deal. I always try to deliver a concept in one part for obvious reasons, but this time the message lies in the *details*, and every time I tried to condense those details, the message suffered. In fact, I feel the details to be so important that regular readers will notice that I have foregone my usual misdirecting introduction (which has often occupied up to 72% of the actual content of my column) to make room for more.

### FOR THE AUDIO PATH YOU ALWAYS USE

First, the obvious (well, the most expensive, at least): If you have too

much time and money, build a metal room. If you are doing okay, and it wouldn't be easy but you could survive it, build a metal room. If you only have a little money, borrow some...and then build a metal room.

I was lucky enough to find a huge roll of mu-metal—the ultimate bulletproof vest for electromagnetic interference—at an electronic junkyard awhile ago. Then I located a place that ran it through a machine that put little slices in it and pulled it apart so it looked like a very thin version of steel catwalk grating. I then totally lined a vocal booth with it—walls, ceiling, floor, door, even over the glass. All seams were soldered, and the entire cage was grounded.

BY STEPHEN ST. CROIX

—CONTINUED ON PAGE 225



# MASSIVE PASSIVE STEREO TUBE EQ



## A PICTURE IS WORTH A THOUSAND WORDS...

Perhaps, but would photographs of our Variable Mu or VOXBOX have created their successes alone?

You have to hear this gear. You have to use this gear. Put your hands on the knobs and crank 'em.

Engineers who have already gotten hold of the MASSIVE PASSIVE have told us: "Why does it make everything sound so much better?", "It's organic and orgasmic.", "It's a f%#king powerhouse.", "It's unlike any other EQ.", "This is IT. The sound I've always dreamt of but couldn't ever get until now."

**GOT THE PICTURE?**

Craig 'HUTCH' Hutchison designed these monsters...



The MASSIVE PASSIVE is a two channel, four band equalizer, with additional high pass and low pass filters. "Passive" refers to the tone shaping part of this clever new EQ design not using any active circuitry. Only metal film resistors, film capacitors and hand-wound inductors sculpt the sound, kinda like a Pultec EQ on hyper-steroids. Super-beefy, hugely-high-headroom Manley all-tube make-up gain amplifiers deliver your tunes into the next realm. You'll need to experience this.

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CIRCLE #117 ON PRODUCT INFO CARD





# DIGITAL CONTROL WITH THE HUMAN TOUCH

THE SPIRIT 328 REPRESENTS A **NEW WAY OF THINKING** IN DIGITAL CONSOLE DESIGN, BRINGING ALL THE FUNCTIONALITY AND SONIC EXCELLENCE OF DIGITAL MIXING TO ALL AUDIENCES. WITH ITS UNIQUE **CONSOLE-BASED INTERFACE**, THE DIGITAL 328 FINALLY BRIDGES THE GAP BETWEEN ANALOG AND DIGITAL MIXERS, RETAINING THE **SPONTANEITY AND EASE OF USE** OF AN ANALOG CONSOLE YET PROVIDING ALL THE ADVANTAGES OF DIGITAL, SUCH AS INSTANT TOTAL RECALL OF ALL DIGITAL PARAMETERS, MOVING FADER AUTOMATION AND ONBOARD LEXICON EFFECTS.

SIMPLY PUT, THE SPIRIT **DIGITAL 328** IS THE MOST ADVANCED ANALOG 8-BUS YOU HAVE EVER SEEN COMBINED WITH THE EASIEST DIGITAL CONSOLE YOU HAVE EVER USED.

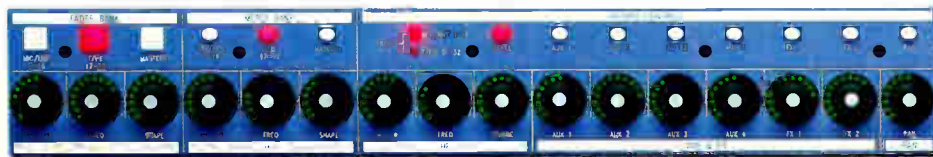
## 328'S E-STRIP MAY BE CONFIGURED AS...



...A HORIZONTAL INPUT CHANNEL WITH FULL EQ, AUX AND PAN FACILITIES..



...OR A ROW OF 16 AUXES OR FX SENDS FOR THE 16 FADERS BELOW THE E STRIP...



...OR A SET OF ROTARY LEVEL CONTROLS FOR THE TAPE RETURNS.

## 42 INPUT/8 BUS CONFIGURATION

For a mixer with such a small footprint, Digital 328 packs an extraordinary number of inputs. Sixteen full spec. analog mono mic/line channels - each with its own balanced XLR connector, dedicated insert point and access to phantom power - come as standard, along with five stereo inputs.

With the 16 digital tape returns on 328's TDIF™ and ADAT™ optical interfaces, there's a maximum of 42 inputs. Every input is fully routable to any of the 8 groups and has access to the full complement of 328's parametric EQ, signal processing, onboard effects and auxiliaries.

## AS EASY TO USE AS YOUR CURRENT ANALOG CONSOLE

Although most digital mixers offer an amazing array of functions, it can often be a nightmare to access them.

In contrast, we've designed Spirit 328 to operate like your old analog 8-bus console, and not like a computer with faders. You can practically take it out of its box and get started without even opening the manual! Unlike other digital mixers, there's instant access to any channel, group or master feature with one button press, and you can see that feature's status from the front panel without having to rely on an LCD display. Access is so immediate that you could even use 328 as a live console.

The key to it all is Spirit 328's unique "E-strip", the lighter-colored bank of encoders and switches that runs across the center of the console. Simply select a channel and the E-strip immediately becomes a "horizontal input channel" with instant access to all that channel's EQ, aux sends, channel pan and routing. Alternatively, press any button in the rotaries section above the E-strip and the encoders change to become a channel pan, auxiliary send or Lexicon effects send for each channel.

Select a fader bank to display mic/line input faders, tape returns faders or group and master faders and that's it; no delving through level after level of LCD menus to find the function you want, no delays in making alterations and no need to study complicated EQ curves. With 328, everything you need is immediately accessible from the front panel of the console - giving you the freedom to let your ears decide.

If you want the functionality of a digital console but the usability of your old analog 8-bus, then Spirit 328 is for you.

## ALL THE DIGITAL I/Os YOU NEED AS STANDARD

Most digital mixers don't include digital multitrack I/Os, which means that to get digital recording and mixdown you have to buy extra, expensive I/O options. In contrast, Digital 328 includes **two Tascam TDIF™ and two Alesis ADAT™ optical interfaces as standard**, allowing you to record 16 tracks entirely in the digital domain, straight out of the box. As you would expect, we've also included a pair of **AES/EBU and SP/DIF interfaces** assignable to a wide range of inputs and outputs, including group and auxiliary outs. In addition, a third optical output may be used as a digital FX Send or as eight Digital Group Outs. All in all, there are 28 Digital Outs on 328 plus 20 Digital Returns, providing enough flexibility for the most demanding applications.

## 2 ONBOARD LEXICON EFFECTS UNITS

Only 328 can offer the world's premier name in studio effects onboard - Lexicon. Two separate effects units are included, offering a full range of reverbs, choruses, delays and flanges, all with fully editable program and parameter settings.

## ONBOARD DYNAMICS

Digital 328 includes two mono or stereo signal processors which can be assigned to any input, output or groups of ins or outs. Each processor provides a choice of compression, limiting and gating, as well as combinations of these effects.

TDIF is a registered trademark of Tascam TEAC Corporation.  
ADAT is a registered trademark of Alesis Corporation.

**digital**

three two eight





### COMPREHENSIVE EQ

All of 328's mic/line, tape/return and stereo inputs have access to three bands of fully parametric EQ, designed by British EQ guru and co-founder of Soundcraft, Graham Blyth. A man with over five million channels of his EQ designs in the field, Graham has brought 25 years of Soundcraft analog EQ circuit experience to bear on Digital 328. If you want the warm, musical sound of real British analog EQ, with proper low, mid and high frequency bands (rather than the low resolution 20Hz - 20kHz bands found on some consoles), look no further.

### UNPARALLELED SONIC SPEC

Garbage in, gorbage out! It doesn't matter whether the console is digital or analog - if you have poor mic preamps, your sound will be compromised. That's why 328 includes Spirit's acclaimed UltraMic™ podless preamps, giving your input signals the cleanest, quietest start of any digital mixer on the market. With 66dB of gain range and a massive +28dBu of headroom, they offer an extremely low noise floor and are virtually transparent. Spirit 328 is 24-bit throughout, with 56-bit internal processing; your signal hits the digital domain through state-of-the-art 24-bit ADCs with 128 times oversampling, guaranteeing that it maintains its clarity, while 24-bit DACs on all main outputs equal this sonic integrity should you wish to return your signal to the analog world.

### MOVING FADER AUTOMATION

All of Digital 328's 100mm faders (including the master) are motorized to allow current channel, tape return, group and aux master levels to be viewed at a glance.

### ALL PARAMETERS INSTANTLY RECALLABLE

In addition to level automation, every other digital parameter of 328 is instantly recallable, allowing snapshots of the entire console's status to be taken. Up to 100 of these "scenes" may be stored internally and recalled either manually, against MIDI clock, or against MTC or SMPTE. Alternatively, every console function has been assigned its own MIDI message allowing dynamic automation via sequencer software.

### EASY TO EDIT - DIRECT FROM THE CONTROL SURFACE

The majority of 328's input and routing parameters may be edited from the control surface without resorting to the console's LCD. Settings and levels may be copied and pasted from one channel to another with just two button presses and, using 328's query mode, the routing or assignment status of every channel on the console may be viewed instantly simply by selecting the function (such as Group 1 or Phase Reverse) you want to question. In addition, with 328's Undo/Redo function located in the master section, editing is entirely non-destructive, allowing you to A/B test new settings with previous ones.

### GROWS WITH YOUR NEEDS

Two Digital 328s may be digitally cascaded, giving you up to 84 inputs at mixdown and 32-track digital recording capability.

### FULL METERING & MONITORING OPTIONS

All of the mic/line inputs, tape return inputs, group and master levels may be monitored per bank via Digital 328's 16 10-segment bargraph meters. Additionally, 328's onboard dynamics processors may be monitored using the console's master meters. Any input may be solo'd using AFL, PFL or Solo-in-Place.



### TIMECODE & MACHINE CONTROL

Digital 328 reads and writes MTC and reads all SMPTE frame rates, with a large display instantly indicating current song position. Store and locate points are accessible from the console's front panel, with 328's transport bar controlling a wide range of devices including Tascam and Alesis digital recorders.

### SOFTWARE UPGRADEABLE

328's open architecture means that any functional improvements and software upgrades can be made easily available off Spirit's website. 328 Mixer Mops for popular sequencing software packages are also available free of charge.

### ADD-ON MODULE OPTIONS

To meet the needs of a variety of users, there are three module options:

#### 8 Channel Analog I/O Interface

Connecting to the TDIF ports, 16 phono connectors provide eight analog group or direct outs and eight analog inputs for tape returns. 17-32. Two interfaces may be connected, allowing 16 track analog recording or access to 16 more sequenced keyboard or sampler inputs.

#### AES/EBU interface

Four pairs of AES/EBU connectors allow optional digital interfacing to hard disk production systems such as Pro Tools. A maximum of two interfaces may be connected.

#### Mic Pre-Amp Interface

Each interface provides eight XLR mic ins with UltraMic+ preamps. Connecting two interfaces turns 328 into a 32 mic input, 8-bus mixer for PA or theatre applications.



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# GEORGE MARTIN

## DOING IT ON THE ROAD



ILLUSTRATION JOSEPH FIEDLER PHOTO SOURCE JOHN STODDART

In 1971, I wrote a college paper on the use of electronic music studio techniques in popular music. The paper, one of the favorite things I did in college (having to do with a course, that is), talked in detail about how Pink Floyd, Frank Zappa and Jimi Hendrix used the tools—such as tape speed change, looping, echo, reversal, splicing, reverberation and so on—developed by the pioneering composers of the electronic medium. These techniques opened up huge new vocabularies of sound to pop musicians and created a new type of rock music that could never (well, until the advent of samplers, which was quite a ways in the future) be performed on the stage.

In my introduction to the paper,

I noted, “By far, the most important contributors to this new field were The Beatles, whose use of tape-manipulation techniques on such albums as *Sgt. Pepper’s Lonely Hearts Club Band* and *Magical Mystery Tour* set the example for all of those to follow.” My friend and fellow music fanatic Carl, when he read that paragraph, immediately opined, “That’s an understatement.” “Yes,” I acknowledged, “but I don’t know how to put it any more strongly.”

Maybe today I do. How about this: What the Beatles were doing between 1966 and 1969 was so brilliant, so revolutionary, so liberating, so mind-blowing, so fall-on-the-

floor-frothing-at-the-mouth amazing, that almost everything else, then or since, pales in comparison. And all of the toys and techniques that we use in the recording studio today, in fact, all of our careers, are a direct result of those projects.

Of course, when it came to the studio, the Fab Four were actually five, the fifth member being the classically trained George Martin, who redefined forever the role of the record producer. Known as Sir George Martin since 1996, he recently announced his retirement, sat for an in-depth interview by Larry the O for *Electronic Musician* (it’s in the February issue; shame on you if you missed it) and embarked on an eight-city public lecture tour, meeting fans and talking

BY PAUL D. LEHRMAN



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about his career, focusing especially on the creation of *Sgt. Pepper*.

The story of The Beatles and how they changed the recording industry has been told many times; they were perhaps the best-documented pop culture phenomenon in history. A wealth of material can be found in Martin's still-available 1979 book, *All You Need Is Ears*, and there are countless others, both by people who knew what they were talking about and those who didn't. But in such a complex and inspiring story, there are always more things to hear—insights, off-the-cuff remarks, little interpersonal exchanges—that can cast new light on the era and the people in it. Martin's current lecture tour (which I caught at the second stop, the sold-out Berklee Performance Center in Boston) goes over much old ground, but he also offers enough new material to keep even the most jaded of pop music journalists, as another icon of the era put it, starry-eyed and laughing.

Martin is not a charismatic public speaker; his presentational style is more suited to small-group conversation. But he had the crowd in his pocket from

the moment he appeared. In fact, he garnered a standing ovation before he even made it to the stage, and throughout his 75-minute lecture and ten-minute question-and-answer period, except for the laughter and applause, you could hear a pin drop. He initially had some trouble reading from his text and coordinating with the videos that

blages as The Goons and Beyond the Fringe, he had a Number One record pre-Beatles with a group called The Temperance Seven: "They were called that because there were nine of them and they drank like fish."

As to how the legendary collaboration came about in the first place, Martin said, "The Beatles were rejected by

**Originally, the "Sgt. Pepper Reprise" was supposed to come after "A Day in the Life," but we knew that nothing could follow that.**

accompanied his talk, but he got more comfortable as the lecture progressed, and it wasn't long before he had the whole crowd convinced they were in his living room.

"I was known as a comedian's producer," he said, "which stood me in good stead when I met The Beatles. I started doing comedy when I started with Parlophone, since nobody else was doing it. I thought if I fell flat on my face, no one would notice." Besides his success with such seminal assem-

every record company, including ours, and were regarded as something of a joke in the business. When Brian Epstein was told to come see me, he knew he'd hit rock bottom."

Quick jump to 1966, which, Martin reminded us, was not a good year for The Beatles. There had been death threats in Hamburg (which I had never heard about before), and an unfortunate, unwitting snub of the Philippines' most famous shoe fetishist, Imelda Marcos, resulted in the band being uncer-



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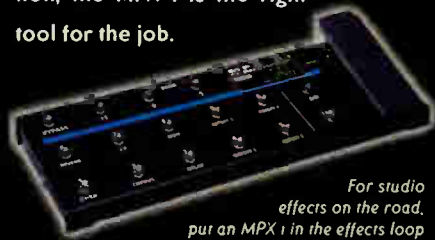
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moniously booted out of the country ("They made them carry their own bags at the airport and turned off the escalators when they got there"). And, of course, John's remarks about their audience being larger than Jesus' hit the teen press in the States and resulted in bannings, burnings and other enlightened responses. Meanwhile, their concerts were becoming circuses. On one of the many videotapes Martin played, Ringo says, "The screaming was like a thousand jet planes. If I tried to play a fill, it would just disappear. I'd be

watching the other guys' buns to see where the beat was."

So the decision was made that year to devote their time to making records, and the motivation was there to create music that couldn't be performed. The first experiment in that direction was "Strawberry Fields Forever," which got its name from a park Lennon loved as a child. McCartney, also appearing on video, explained that "Penny Lane" was his response to that: "It was a place John knew, because we'd go there when he came over to my place when we were kids."

Under pressure from EMI to get

something on the charts, the two songs were released together as a single, something Martin called "one of the biggest mistakes I ever made. It meant the airplay was split between the two songs, so it only made it to Number 2. People were wondering if The Beatles were finished." Meanwhile, because they wanted record buyers to get "value for their money," the two songs couldn't appear on the next album, and what was to be *Sgt. Pepper* had to be started from scratch.

The album, cobbled together from bits and pieces, was not a "concept" album at the beginning. "The opening audience ambience came from a Beyond the Fringe recording I had done in Cambridge," Martin told us. The whole idea of *Sgt. Pepper*, which came about halfway through the process of making the album, was something that came to Paul after a trip to the United States—now that the band was done touring, they were free to travel on their own. "He started talking about the album being songs that Sgt. Pepper's band would write, not that The Beatles would write." Even the brilliant transitions between songs didn't emerge until after they were all recorded and they were assembling the final master: "Originally, the 'Sgt. Pepper Reprise' was supposed to come after 'A Day in the Life,' but we knew that nothing could follow that. So we put it before, and there was John's acoustic guitar coming up from under the applause. Then we found the way the guitar count-in at the beginning of the reprise sounded linked beautifully with the chicken squawking at the end of 'Good Morning.'"

"A Little Help From My Friends" was written by Paul especially for Ringo, since he had a "limited range," using only five adjacent notes. "Except for the last note—and when he recorded that, all the others were out there in the studio with him, singing along, to give him confidence." On video, Ringo recalled, "The first line was originally, 'Would you stand up and throw tomatoes [pronounced to-mah-toes] at me?' Well, people were throwing all sorts of things at us, and I didn't want to give them any ideas, so I made them change it."

"Ringo was underemployed during the making of the record," recalled Martin, "because after he laid his tracks down, there wasn't much for him to do, except wait around in case we needed some extra percussion. He says his one memory of doing the album was that

—CONTINUED ON PAGE 226

## Digital Studio Essentials

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# THE GENTLE ART OF BIT-SPLITTING

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**A**N APOGEE CONVERTER does a great deal more than give your recordings an incredible sound. Multiple interface capability, format conversion and Apogee Bit-Splitting are just some of the features.

Apogee Bit-Splitting (ABS) provides your existing digital multitrack recorder with a wealth of additional possibilities. Make your existing 16-bit recorder handle 24-bit, for example, or even record at 96 kHz on a 48 kHz machine! Here's an overview of the capabilities of ABS.

ABS works by recording high-resolution (20 or 24-bit) signals on more than one 16-bit track of your tape machine. It'll work on any machine with bit-accurate recording across the tracks—and that means any digital tape machine or MDM, as well as many other systems.

Bob Clearmountain's rack of AD-8000 systems enables him to record full 24-bit audio on his 3348HR DASH recorder. But ABS on the AD-8000 allows everyone with a DASH multitrack to benefit from high resolution recording—without having to buy a whole new machine.



Apogee's AD-8000.



For example:

- 3348HR—48 tracks of 24-bit audio (no bit-splitting);
- 3348—36 tracks of 20-bit or 24 tracks of 24-bit;
- 3324—18 tracks of 20-bit or 12 tracks of 24-bit.

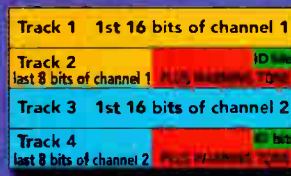
In addition, the AD-8000 can be used in conjunction with a 16-bit modular digital multitrack—such as an ADAT or Tascam machine—to record 20- or 24-bit signals:

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- Four channels of 24-bit on an 8-track 16-bit recorder. (see diagram).

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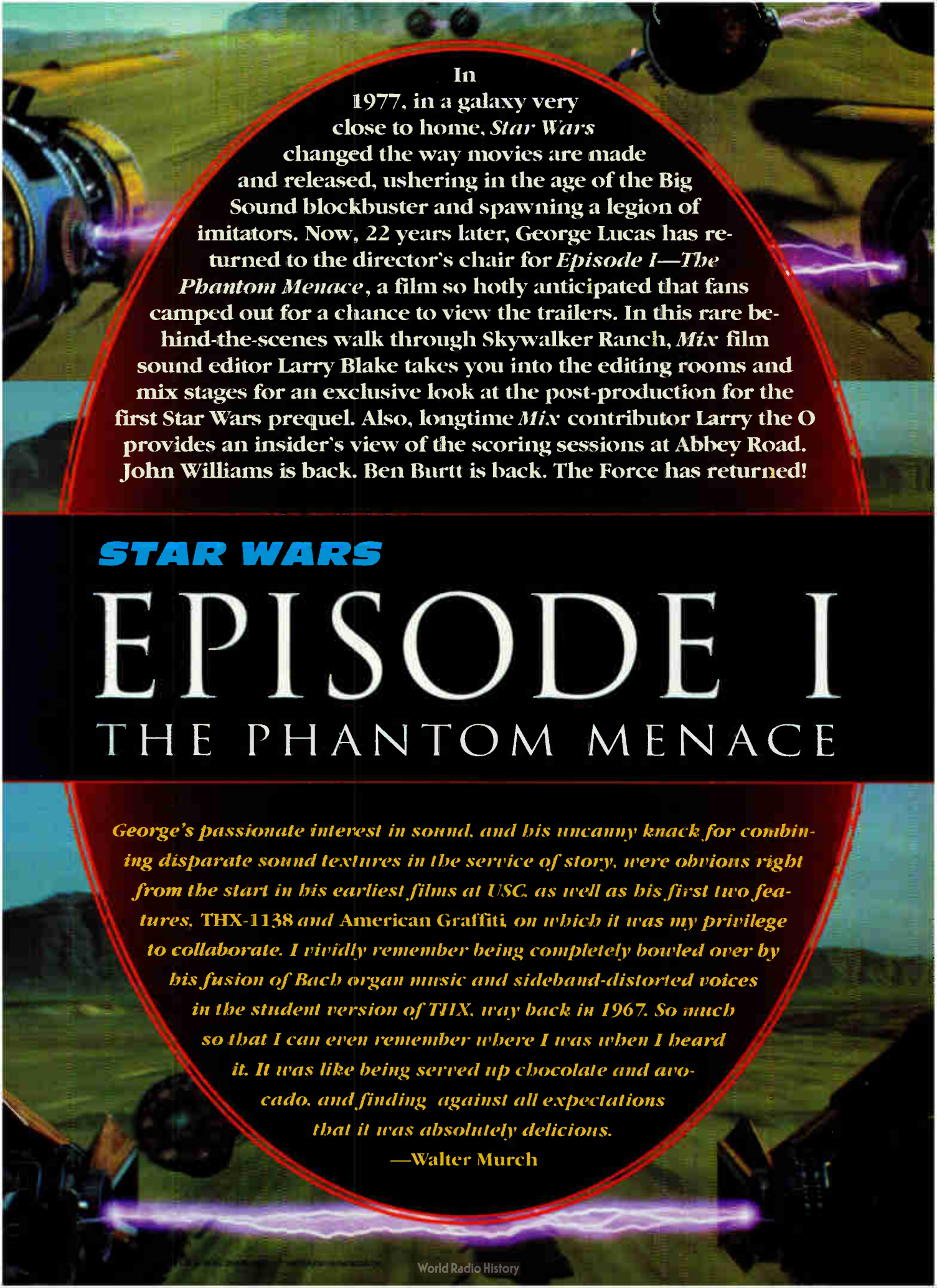
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In 1977, in a galaxy very close to home, *Star Wars* changed the way movies are made and released, ushering in the age of the Big Sound blockbuster and spawning a legion of imitators. Now, 22 years later, George Lucas has returned to the director's chair for *Episode I—The Phantom Menace*, a film so hotly anticipated that fans camped out for a chance to view the trailers. In this rare behind-the-scenes walk through Skywalker Ranch, *Mix* film sound editor Larry Blake takes you into the editing rooms and mix stages for an exclusive look at the post-production for the first *Star Wars* prequel. Also, longtime *Mix* contributor Larry the O provides an insider's view of the scoring sessions at Abbey Road. John Williams is back. Ben Burtt is back. The Force has returned!

**STAR WARS**

# EPISODE I

## THE PHANTOM MENACE

*George's passionate interest in sound, and his uncanny knack for combining disparate sound textures in the service of story, were obvious right from the start in his earliest films at USC, as well as his first two features, THX-1138 and American Graffiti, on which it was my privilege to collaborate. I vividly remember being completely bowled over by his fusion of Bach organ music and sideband-distorted voices in the student version of THX, way back in 1967. So much so that I can even remember where I was when I heard it. It was like being served up chocolate and avocado, and finding against all expectations that it was absolutely delicious.*

—Walter Murch




**THE  
COMPLETE  
STORY  
OF POST-  
PRODUCTION  
FOR  
'STAR WARS:  
EPISODE I'**

BY LARRY BLAKE

**I**T IS CONSIDERED AXIOMATIC in the movie industry that any improvement in technology will turn on its users like Frankenstein's monster. What might otherwise be thought of as benefits—nonlinear picture and sound editing, console automation—instead become procrastination tools for unprepared producers and directors. Sometimes the down side could be described as *planned procrastination*, as when a film is scheduled a year in advance to finish shooting less than two months before it will appear in thousands of theaters.

**FINISHING THE**

# PHANTOM



Whether as a result of poor planning or intentional insanity, anyone working in top-level feature filmmaking today assumes that there will be no time to do it right and just enough time to get it done, period.

The making of *Star Wars: Episode I—The Phantom Menace* was nothing like this.

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It may be against the grain of Hollywood, circa 1999, but no part of this endeavor is a new way of working for writer/director

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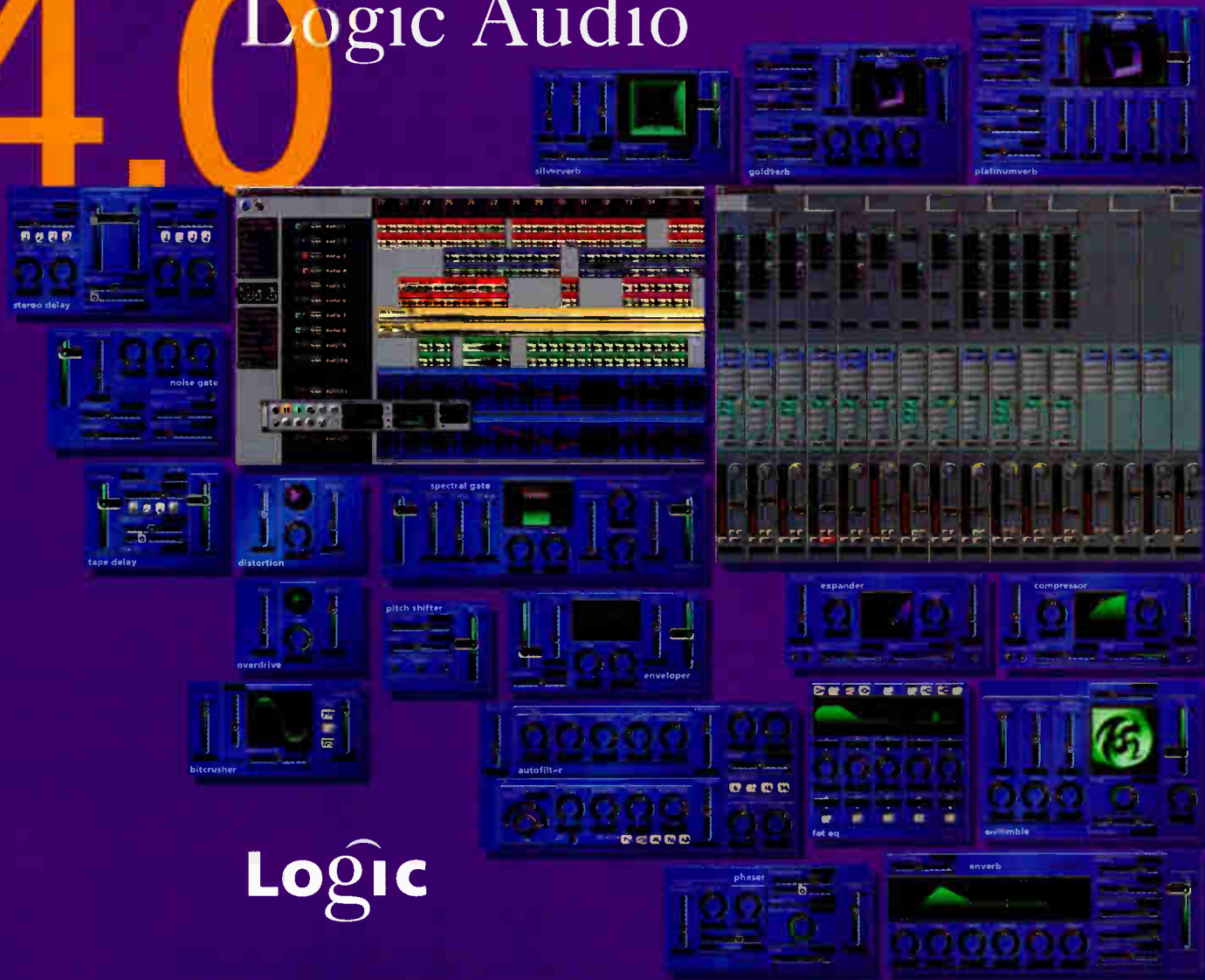
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CIRCLE #019 ON PRODUCT INFO CARD



George Lucas. Sound, for one, has never been an afterthought for him. Remember, this is the guy whose first film, *THX-1138*, was co-written by his close friend and post sound guru Walter Murch. The sense of space created by the mono soundtracks of *THX* and his second film, *American Graffiti* leave in the dust most of today's mixes—workstation-edited and blasting 6-track digital though they may be. Lucas didn't just show up at the mixes; he had his hands on the faders alongside Murch. He kept enough of his writer/director's hat on at the console

*Right: Something old, something new—Ben Burtt in his sound design suite with his Synclavier, 1/4-inch Otari deck, Mackie HUI control surface and Pro Tools.*

*Below: Supervising sound editor Tom Bellfort, who won an Oscar for Titanic*



to see the whimsical name hidden in Murch's intercom request for the machine room person to load up R2-D2, or reel two's second dialog unit.

In 1975 he hired a young sound editor named Ben Burtt two years before *Star Wars* would come out, giving him the time, tools and environment to create the soundscape of a galaxy long ago and far away. So familiar was the track on first listening that it's now almost insulting to think of the voices of R2 or Chewbacca as sound effects.

This article will take a comprehensive look at the sound for *Episode I*, coming May 19 to a theater near you. A companion piece (see page 58) delves into the seamless relationship between picture editing

and sound, the common link being Messrs. Lucas, Burtt and a lean, mean crew.

### PHILOSOPHICALLY SPEAKING

Lean would apply to the producer's title, too. All-too-commonplace in credits these days is a chorus line of producers, executive producers, co-producers, and line producers, some of whose only contact with the production might have been to suggest to someone that the film be made. On *Episode I*, you will see only one card with any variation of the word "produce" in it: Produced by Rick McCallum, who first worked with Lucas as producer of Lucasfilm's *Young Indiana Jones Chronicles*.

"We wanted to break the barrier down between production and post-production," McCallum says. "It was written into the actors' contracts that we would shoot, do another cut, look at it and step back, and then come back for more shooting. We rented the facility at Leavesden [in England, where most filming took place] for two years anticipating this."

Burtt sees that with smaller crews, "you don't have the normal kind of breakdown defined by the union or tradition. People multitask and do different things. Matthew Wood [co-supervising sound editor] was at one time credited as 'Architect' because you can't compare his job exactly to anything that has been done before. It's a composite, with new things

## STAR WARS CREW LIST

Post Production Sound Services  
Provided By Skywalker Sound,  
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### Re-Recording Mixers:

Gary Rydstrom, Tam Jahnson,  
Shawn Murphy

### Supervising Sound Editors:

Ben Burtt, Tam Bellfort

### Co-Supervising Sound Editor:

Matthew Waad

### Sound Effects Editors:

Teresa Ecklan, Chris Scarabasia

### Foley Mixer:

Frank "Pepe" Merel

### Foley Recordist:

Dennie Thorpe, Jana Vance

### Foley Artists:

Bruce Lacey, Marian Wilde

### Dialog/ADR Editors:

Sara Balder,  
Gwendalyn Yates Whittle

### ADR Recordist:

Matthew Waad

### ADR Recorded At:

Compass Point  
Studios, Nassau, Bahamas; Gallery  
Studios, London

### Assistant Sound Editors:

Kevin Sellers, Steve Slanec  
Assistant Dialog/ADR Editor:  
Jessica Bellfort

### Music Composed By:

Jahn Williams

### Score Recorded At:

Abbey Road Studios, London  
Scoring Engineer: Shawn Murphy

### Music Editor:

Ken Wannberg

### Assistant Music Editor:

Peter Myles

### Re-Recordist:

Ronald G. Raumas

### Mix Technicians:

Tony Sereno,  
Jurgen Scharpf, Kent Sparling

### Machine Room Operators:

Brandon Procter, Stephen  
Ramanka, Jennifer Barin

### Digital Audio Transfer Supervisor:

Janathan Greber

### Digital Audio Transfer:

Dee Selby,  
Christopher Barran

### Video Services:

Christian Von  
Burklea, Jahn Tarrijas

### Projectionist:

Scott Brewer

### Edited By:

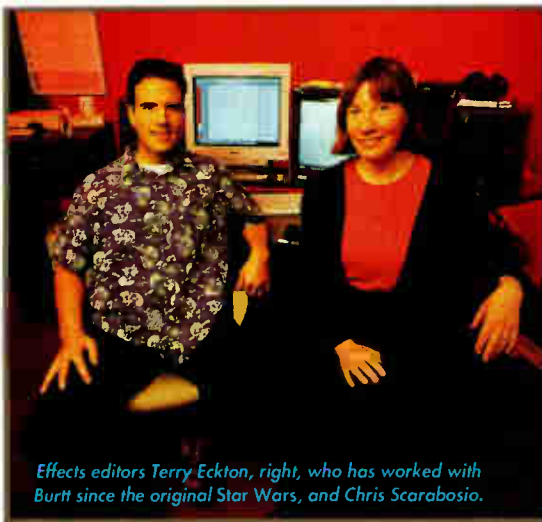
Paul Martin Smith,  
G.B.F.E., Ben Burtt

### First Assistant Editor:

MaryPat Plattner

### Post Production Supervisors:

Michael Blanchard, Jamie Farester



Effects editors Terry Eckton, right, who has worked with Burt since the original *Star Wars*, and Chris Scarabosio.



added—like me on the first *Star Wars*; gravitating between mixing and cutting and recording violated all the traditions at that time.”

### PRODUCTION SOUND

Production sound was handled by John Midgeley, who was assisted on boom by June Prinz. Recordings were made to an HHB PortaDAT PDR-1000, with the Sennheiser MKH-60 and Schoeps CMC-41 as his primary mics.

Picture editor Paul Martin Smith (who shares credit with Burt) says, “I thought that [Midgeley’s] production tracks sounded fantastic. One of his biggest problems was keeping up with everything on set, and he was very forward-thinking. George’s style of directing tends to be more ‘on the run’ than finely planned out, very similar to documentary filmmaking.”

Smith adds that “a lot of dialog these days sounds very sterile, even when you start adding everything to it. Using production always has an immediacy, and what the actors are doing sounds more ‘realistically emotive’ than if you put them in the studio later on. George was very keen on using as much of production as possible for that very same reason. John made that very possible.”

Among the elements that Midgeley was battling were ILM’s



The mentor and the protégé: Ben Burt with Matt Wood.

infamous VistaVision cameras. VistaVision was Paramount’s entry into the widescreen sweepstakes of the ‘50s, running standard 35mm film horizontally through the camera and using eight perforations per frame—just like standard 35mm SLRs—instead of the usual four. The format was resurrected by the nascent ILM in 1975 as a way to shoot “plates” for optical effects; the larger image size helped to hide the generation loss when reduced back to standard four-perf film. The down side to the sound world is that it runs at twice the speed of standard cameras (for a given frame rate), and being unblimped, the

cameras are very noisy.

The soundstages at Leavesden were not dead-quiet, either, since it was designed as a factory to make Rolls-Royce aircraft engines and not as a film studio. This was further hindered by sets being built next to ones where shooting was taking place. “It’s a tin shack, and I would scream and shout a lot,” remembers Midgeley. Smith notes that “you can’t put somebody in worse atmosphere than that.”

A possible contender would be Tunisia (standing in, as before, for Tatooine), where the schedule put the crew right in the middle of the annual “suicide fortnight,” when temperatures reached 127 to 132 degrees Fahrenheit.

## THX

Perhaps the most visible part of George Lucas’ empire, outside of the films themselves, is the THX Division, which is responsible for licensing professional and home theater systems, and for overseeing home video mastering and duplication. One noteworthy contribution to *Episode I* is the fact that at every step of the production and post, whenever there was a monitoring situation, it was in a THX-certified environment or using THX-certified products. This included the picture editing rooms, sound design suites, screening rooms, mixing stages—even a home system for dailies. During the production, THX’s pm3 (professional

multichannel mixing and monitoring) small-room program was being developed; by the end of production, it was ready for the rest of the world.

Another part of THX is TAP, or Theater Alignment Program, which is hired by distributors to keep an eye on every aspect of presentation, from print quality to the alignment of theaters. As expected, prior to the May 19 opening of *Episode I*, TAP will be out in force on behalf of The Force. Every tenth reel produced by each lab (domestically and internationally) will be QC’d, and the 200 TAP-approved theater service technicians in the U.S. will start checking in on multiplexes starting in early May.

—Larry Blake



## SHIFTING TO SOUND DESIGN

After he did the sound design and re-recording for Steven Spielberg's *Always* in 1989, Burt took a seven-year sabbatical from feature film sound. In addition to picture editing and directing with Lucas and McCallum on episodes of *Young Indy*, he worked on many IMAX films, including *The Dream Is Alive* and *Special Effects*, which he directed in 1996. That year he also spent many months working on the restoration of *Star Wars*, *The Empire Strikes Back*, and *Return of the Jedi* for the Special Edition re-release.

When he shifted over to sound design for *Episode I* in July 1997, he hadn't "officially" done any sound work for years and hadn't been trained on any digital editing system. Because I wasn't employed as a sound designer for seven or eight years," he says, "I didn't keep up with the technology."

Matthew Wood, who had worked at Lucasfilm since his teens as a tester in the games group, and who later worked on *Young Indy*, was given the task of setting up what Burt terms a "modest, but totally up-to-date sound design workstation. Matt wanted everything to be digital, because in this era, emotionally and psychologically, it had to be. He set up the patching so that we can go from any audio source, and they all meet at a digital intersection." The first creative task for Burt was to continue with his work (begun for the Special Edition)

On a typical *Star Wars* or *Indiana Jones* film, Burt will create about 800 to 1,000 named sound effects files, including vehicles, weapons and ambiences for each new film. "For this film, generally speaking, it's all new, with just a few old," he says. "We use the same sounds for light sabers, although we have a few new kinds of light sabers based on the same original principles as the old sounds. I went back to the original elements and recombined them with different pitch and character so it still reads as 'light saber.'"

"Because of the signature nature of the stormtrooper laser in the first film, which everybody identifies, we've used it to some degree in this film," he adds. "There's a recognition association factor with *Star Wars* that's important to acknowledge. I've definitely keyed off of that, and the sounds are familiar when they are justifiable."

Burt's favorite sound design tool since the early '80s has been the Synclavier, which is also the primary axe for his colleagues at the Ranch and many sound designers in New York. "I still use the Synclavier for multitracking because it's a tool that I know, something that I love and am familiar with," he says. "It's a performance instrument, unlike Pro Tools. You can put sounds on the keys and just play it. You create directly from your imagination to the speakers in a feedback loop." The end results are recorded in Pro Tools, which now func-



Re-recording mixers Tom Johnson (second from left) and Gary Rydstrom (center) with mix technicians Tony Sereno (left), Kent Sparling and Jurgen Scharpf (far right) at the Capricorn in Mix A.

in restoring the original *Star Wars* sound library.

Starting in the mid-'80s, Lucasfilm started to archive its ¼-inch sound effects library onto what it believed was then the most stable digital medium, ¼-inch DASH. But when Burt started work in 1996 on the Special Edition, he went back to the original ¼-inch, or sometimes even 35mm rolls, whatever was ground zero for a given effect. His sound design *modus operandi* in the old days was to record on ¼-inch tape, put it on multitrack (either 8- or 24-track tape), mix that down to a ¼-inch worktape, which would then would go into the library. This would be transferred to 35mm mag, and the editor would cut it in. Burt notes that he was "born in an era where generation loss meant something. And although those [DASH] tapes sound fine, a lot of that stuff by the time it has gotten to me has really gone through any number of translations. Maybe one multitrack generation, two generations of ¼-inch, then DASH, then CD, then maybe sample rate conversion.

"So when I needed an original *Star Wars* effect like the light saber, I went to my original ¼-inch and did the transfer myself and had the confidence that I was working with the best that I could hear," he continues. "Also, I could go to original unmixed elements that weren't in the library. Some of it was even on ¼-inch 4-track tape! I was able to go through and update those elements and put them in my system digitally."

tions as Burt's multitrack machine. He will then either bounce effects down to a composite stereo pair, or he keeps the original separate elements for the editors. He monitors on an M&K 5.1 system.

His sound design work outside of the Synclavier includes speed manipulation with ¼-inch tape, along with the Kyma workstation. "There are marvelous processing programs in it for pitch and speed changes," he says.

The crew had thousands of effects, both old and new, online and catalogued with cross-referencing and a database that any editor could go to. After creating a sound, Burt identifies it and puts it in a library database so the other editors can come and get it. "The big difference, essential for me, between then and now, is that we have a library of sound so accessible so quickly that I can find and audition things that I've recorded, manufacture something and do a mix and pass it on to the editors...all from one desktop workstation! This has made the process very efficient."

Wood adds: "We've used [Gallery Software's] Sample Search to manage getting Ben's effects sessions to the editors and how we interface with our database for renaming," says Wood. "Kevin Sellers, an assistant editor here, created a program called Panorama Database, which ties Ben's whole library to-

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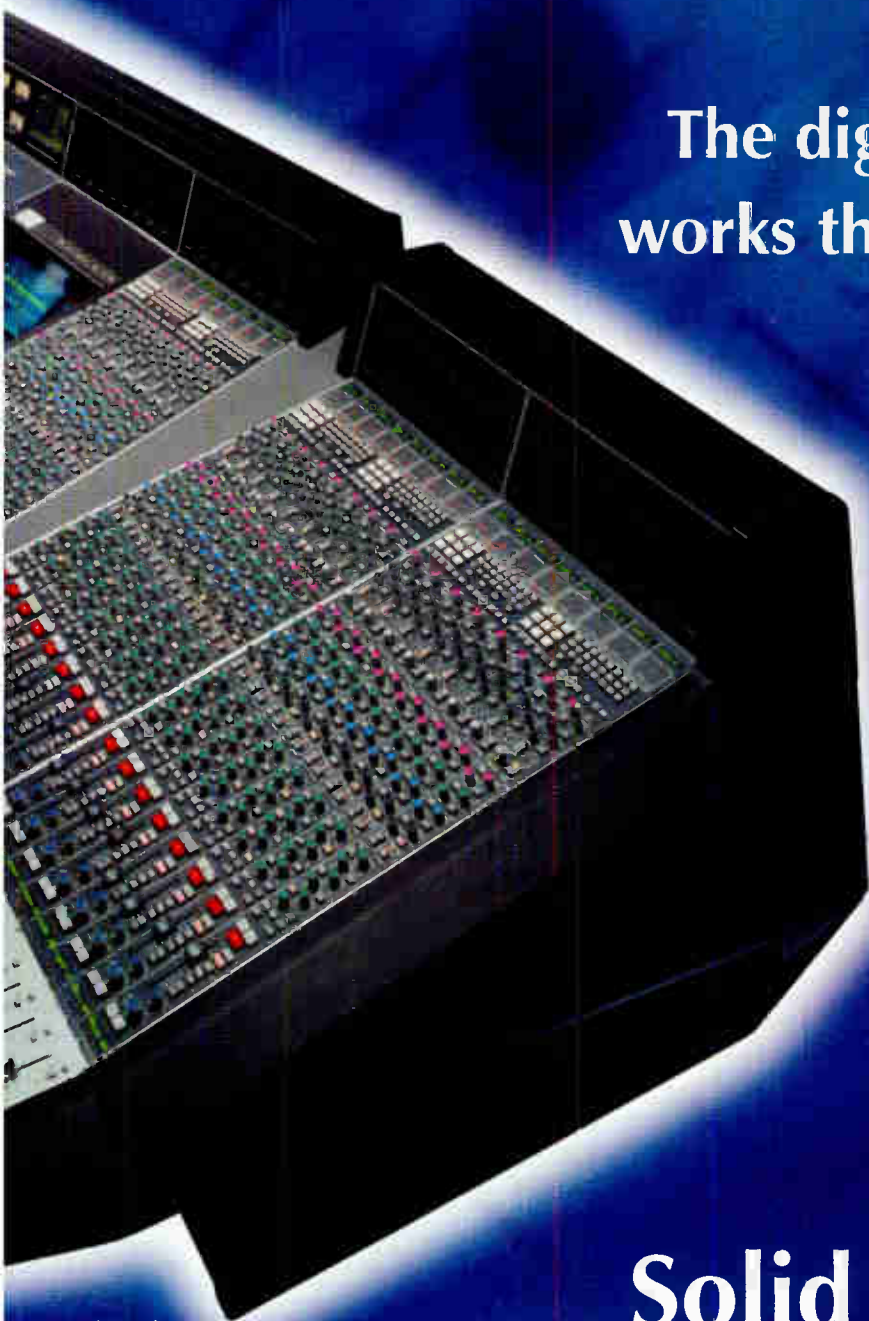
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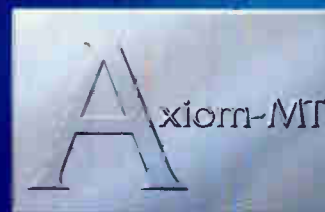
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gether. We also use [Gallery's] Gearbox to do the ratio change and sample rate conversion to send our mix to [the picture department] in the Main House. "

## TEMP DUBS

Temp dubs for *Episode I* were handled primarily by Burt himself, working in conjunction with Wood and supervising sound editor Tom Belfort. This was not a film that was going to spend hundreds of thousands of dollars on weeks of mixing and sound editors. Outside of their value in giving everyone a sense of where the film is going, Burt views temps as "a great chance to try and fail, or try and accidentally succeed.

"I worked as a picture editor for the first two years of this project, so I got pretty familiar with the movie and knew the footage," he explains. "I tried to include, in my editing, visual structures which would give me interesting sound things to do later—leaving a pause visually because I knew there would be a sound, or if the ship came by I let it go offscreen so we could have a pass-by in the surrounds. Of course, George cut that all out. [Laughs.] Well, not all of it.

"I took the existing cut of the movie early on and made an extensive temp," he continues. "I put in key sound effects and backgrounds where they were absent. I developed temporary voices for alien characters. For a sound designer, it was great to have enough voices and memory that I could do a very dense and rather complete version of a reel.

"The ADR [see sidebar] had been done months ago, and we had an A track that was far superior than you would normally have. I cut temp music from our usual sources of other movies and classical music, something I've always done here."

By the third or fourth cut, some sequences were enough in shape that they needed more sophisticated sound, which was made easier by Burt's ability to automate mixes within his Pro Tools system, courtesy of the Mackie HUI control surface. "Fortunately, with the HUI and the automation of the HUI, I can do the most sophisticated one-man mixes that I've ever done. I can walk out of here with an Lt-Rt or even a discrete 6-track that would be satisfying to most audiences. I've mostly been doing Lt-Rt's because we mostly need to lay back to videotape.

"The pod race [a drag race between aliens in reels 3AB and 4AB] is almost a film unto itself, and I've pushed it forward each time we've had a screening," he continues. "We've probably had seven screenings of the film with temp dubs, and each time I've remixed and recut, but I've kept the same original tracks. I've added to them, deleted what I don't want, but everything has volume graphs and pan graphs. I haven't done any premixing—everything is still on its original tracks. In the past, we would do a big temp mix and basically it was all thrown away and we started fresh: new transfers, ordering up lists of things. None of that has happened on this film. Every time we've recut the picture, we've recut the Pro Tools sessions to conform. [Burt used assistant editor Kevin Sellers' panorama "EZ Conform" process, an automatic script for applying Avid picture change notes to a Pro Tools session.] It's kept the automation that I started with in July, and I haven't had to backtrack that much.

"My temp mix evolves into the final mix, and I just pass these sessions onto the two effects editors [Chris Scarabosio



**Top:** Foley editors Bruce Lacey and Marian Wilde. **Left:** Foley recorder Frank "Pope" Morrel, left, and Foley mixer Tony Eckert at the SSL 5000. **Above:** Foley artists Dennie Thorpe, left, and Jana Vance in the Skywalker Foley stage, wearing the boots and holding the props that turned their actions into the sounds of droids.

and Terry Eckton]. We looked at my tracks and looked at what I've done. I've said, 'Here's where I've done it right,' or, 'I don't have enough detail here,' or, 'I have a new idea here,' and they started with my tracks and will modify it as needed. It's wonderful to see editors build upon my foundation and polish things I may have done sloppily, but that gave them the right impression."

## CREATURES

One of Burt's great skills is the life that he can breathe into aliens, both those who make noises (such as Chewbacca, who is not seen in *Episode I*) and those who speak a discernible language, such as Jabba the Hutt.

Burt says that in *Episode I*, "A few key characters, the Gun-gans, speak a form of pidgin English with strange phrases. George wrote it that way in the script, and worked it out with the actor on the set. It's not so much an alien language as 'alien phraseology.' We have another set of characters called Neimoidians who speak English because they're human-like (in spite of being reptiles) and carry a lot of exposition in the film. We wanted to give them an accent and a manner of speaking that is completely intelligible, yet also alien."

Tom Belfort says that they were first looped in Thailand, using Taiwanese actors to give a slightly different quality. Then, using the Taiwanese as reference, the dialog was re-



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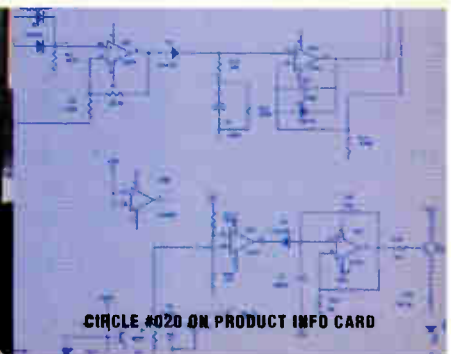
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looped by actors in England. The faster they speak English, the less intelligible they get. "You have to be careful not to make it any way comical or ethnically recognizable—all of these issues have to be sorted out," Belfort says.

Jabba the Hutt makes a reappearance in *Episode I*, along with a whole cast of characters on the Planet Tattoine. They speak Huttese, which Burt had already developed for *Return of the Jedi*. Last, but most definitely not least, there's R2-D2. He was cut for the temps reusing the same dozen or so phrases, and in January Burt loaded in his library of a thousand phrases in preparation for editing by himself and Terry Eckton, who was an editor with Burt on *The Empire Strikes Back* and *Return of the Jedi*. She spent her first week on the film (last October) cutting motors for all of the droids, "for old time's sake."

## TWO SOUND EFFECTS EDITORS? A STAR WARS MOVIE?

The huge sound editorial crews of many recent Hollywood films have become the stuff of legend. Given only a few weeks to do all the sound editing and mixing, you can find at least a half-dozen films with more than two dozen credited editors, plus half as many assistants, needed to bring all the dialog, sound effects, Foley and ADR to multiple re-recording stages.



From left, assistant dialog/ADR editor Jessica Belfort, and dialog/ADR editors Sara Bolder and Gwendolyn Yates Whittle.

"This was never going to happen on this film," McCallum says.

Starting last fall, Burt and Belfort brought on a small crew of trusted colleagues, beginning with Terry Eckton and Chris Scarabosio on sound effects. They divvied up the show into odd and even reels, with Eckton taking the odds and Scarabosio the evens. The effects for each reel were on a single 4- or 9-gig hard drive.

One of the more deceptively amazing aspects of the sound editorial on *Episode I* was the Pro Tools effects sessions: With the exception of the big battle in reel 6AB, all sound effects, including backgrounds, for each reel were in a single session, totaling approximately 80 to 128 tracks. Because their Pro Tools systems had only 32 voices, in order to listen to everything at once, Eckton and Scarabosio would make bounces of different premixes within the session. Similarly, Scarabosio received from music editor Ken Wannberg a stereo bounce of the music for the big battle in reel 6AB.

The one scene that Burt did cut by himself was the pod race, save for crowds.

## FOLEY

Foley recording for *Episode I* took place at the Ranch over four weeks in February and March. The Skywalker crew consists of

## FIELD ADR RECORDING

It all began with Matthew Wood's Idea.

"It came to me when I saw the new Macintosh G3 PowerBook line that can handle a lot of stuff that a desktop machine could," Wood says. "I got the idea, 'Why not bring a Pro Tools-type situation to the field for ADR recording?' I knew that I could pretty much duplicate everything you have in an ADR studio with a few roadcases of equipment. We have everything: picture, guide track, beeps and streamers [to visually guide actors to the line beginning]. I presented the idea to Rick [McCallum], and he was very excited about it. He hates doing anything traditional, and he loved the idea of us going to the actors."

The idea became reality, and soon Wood's system was in London recording ADR at MagMasters. Eventually, their travels would also take them to Mexico and to Compass Point Studios in the Bahamas, then back to London for final looping at Gallery Studios and Abbey Road Studios. The video of the whole movie is digitized to the PowerBook's internal IDE hard drive. On an expansion bay there is a 4-gig drive where the guide tracks are stored. The other expansion bay contains a chassis expander, which contains the Miro DC-30+

card and the AudioMedia III card for the digital I/O. As backup, Wood not only records on a standard DAT, but also burns CDs containing the finished Pro Tools sessions and audio files. "The sessions go a lot faster because it's nonlinear, instant access," he says. "You can keep recording takes, and it auto-names and saves everything. If the schedule requires it, I can send this back to The Ranch over the Internet, or FedEx it back to the editors. There's no waiting for transfers."



Matthew Wood

The microphone complement in Woods' system are the production faves Sennheiser MKH-60, and the Neumann KMR-81, plus a Neumann TLM-103. They feed into a Focusrite Green One dual-channel mic pre-amp that goes into an Apogee AD-1000 A/D converter, which creates a digital feed for the DAT and the AudioMedia card. The loops are cued in Skywalker assistant editor Steve Slanec's program ADR Manager, and that data is imported into Gallery Software's ADR Studio program, which runs on top of Pro Tools.

Supervising sound editor Tom Belfort thinks "the applications are far greater than we've explored on this film. ADR stages always sound antiseptic and 'loopy.' With this system you can go anywhere. All told, *Episode I* had 1,400 looped lines; by way of comparison, *Titanic* had 4,000 lines.

—Larry Blake



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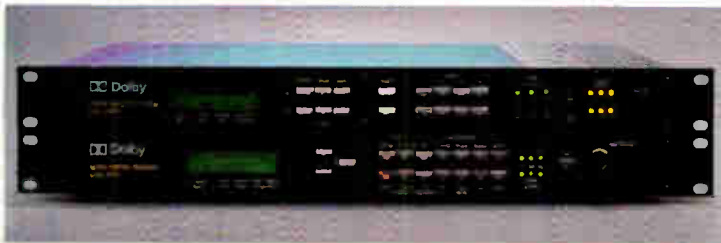
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Foley artists Dennie Thorpe (who did *Return of the Jedi*) and Jana Vance, mixer Tony Eckert and recordist Frank "Pepe" Merel.

After the show had been spotted, Foley editors Bruce Lacey and Marian Wilde created sessions with separated regions indicating where the cues would be recorded. This gave Eckert and Merel not only an easy blueprint of how to lay out the tracks, but also a head start in the naming of the files, as the

Foley was shot directly to Pro Tools. All reels fit in under 24 tracks.

An essential ingredient in all Foley stages is the amount of creative junk they have to choose from. Thorpe and Vance went on a "shopping spree" for funky things, in keeping with Lucas and Burt's original concept of a lived-in, organic world. Special attention was paid to finding and making special shoes for robots and battle droids.

## THE RETURN OF WORLDIZING

Anyone who has seen *American Graffiti* remembers the great "you-are-there" feeling derived from the sound of music coming from the car radios. This was the virtual invention of what we now think of as "source," or music that alternates between source and score.

To achieve this, Lucas and sound designer Walter Murch created a complete radio show with Wolfman Jack and mixed it down to 1/4-inch mono with a sync pulse. They re-recorded the whole show in an alley, with Lucas on one side holding a small powered Nagra speaker, slowly turning back and forth, and Murch on the other, likewise turning. The effect was a random sequence of off- and on-axis sound, but all having the natural slap. (Murch's Nagra was fed a sync pulse from the playback deck to ensure constant sync lock.)

At the final mix, Lucas and Murch were able to choose from any possible combination of three tracks: the original direct dry recording, the first "worldized" track in sync with the track, and another print of it, this one slipped in sync to give a slight slap. Very clever, very simple and very effective.

At Lucas' behest, the tradition continued on *Episode 1*. "George has always asked for this," Burt says. "I still have 1/2-inch tapes from *Star Wars*, by reel, from worldizing that I did for individual characters. 'Chewbacca, Reel 4.'" In dialog there's no question it can work really well. The difficulty is always finding the environment, free of noise and crickets!

For *Empire* and *Jedi*, Burt re-recorded the light saber sounds through speakers, matching the movement like Foley with a shotgun mic. In order to keep up with Darth and Luke, the film was projected (and worldized track recorded) at half-speed.

—Larry Blake

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## DOLBY DIGITAL SURROUND EX

Having mixed over a dozen films with stereo surrounds, in 1997 Gary Rydstrom was looking for a way to spatially enhance his mixes and approached Lucasfilm's THX division, which in turn approached the three digital sound format companies (Dolby, DTS and SDDS).

Dolby and THX played around with various ideas, and in what they both say was a classic example of parallel invention, they simultaneously thought of matrix-encoding a third surround track onto the previously existing stereo surrounds. This required only matrix-encoding prior to print mastering, and decoding in so-equipped theaters, but no fundamental changes to the print recording format.

During the mix of *Episode I*, Rydstrom is recording the center-rear surround channel on its own track on pre-mixes and stems, but monitoring the surrounds through the matrix. An insert point takes the three channels into two via a Dolby Digital Surround EX encoder card and then back to three using a standard Dolby Cat. No. 150-F decoder. The encoder differs from the one used in standard



Dolby Stereo applications by the way it helps ensure that essentially monophonic surround information (i.e., the same on left and right surround) will not collapse back into the rear wall.

David W. Gray, the director of Dolby Laboratories' Hollywood Film Division, says, "We thought about a 'voice of God' channel in center-roof of the auditorium. But because it would only be used once or twice in a movie, and no theater already has speakers mounted there, it's not a practical idea."

Rydstrom says, "It's great to have three articulated sources of ambience back there. The planet of Naboo has some weird, junglish ambiances. To be able to put specific creatures in the three surround channels is really fun. It gives you more of an encircling feel with the ambiances, that

something is behind you as opposed to next to you.

"There are a lot of shots where 50 ships might pass by directly overhead, and you can have three discrete experiences between the left, center and right fronts and surrounds," he continues. "Anything that helps articulate sound is a good thing.

—CONTINUED ON PAGE 54







The current Foley studio at The Ranch was built in 1996, when it was decided to convert the original studio in the Tech Building into Mix A, pictured on this month's cover. (The only part that remains from its days as a Foley room is the inscribed signature that the late Japanese director Akira Kurosawa wrote in the foundation when he visited The Ranch during construction.)

*Standing amid the racks of Tascam MMR-8s in the Central Machine Room are, 1 to r, machine room operators Brandon Proctor and Stephen Romanko, Chris Barron from transfer, re-recording supervisor Ron Roumas, digital audio transfer supervisor Jonathan Greber, Dee Selby from transfer and machine room operator Jennifer Barin. The white drive bays to the left of Barin tie in to the Technical Building's SGI Origin 200 servers for daily backup.*

with the crew rehearsing each premix until it was right and then recording a 1,000-foot reel in a single pass with no automation in sight. The first *Star Wars* film, coming at the end of that era, mixed for 12 weeks, *Close Encounters of the Third Kind* for 16.

Flash forward over 20 years. This decade has seen an alarming trend in Hollywood post-production to have multiple re-recording stages working day and night to meet a release date. The result is mixes (stage time only) that cost over \$1 million, money that is everywhere but on the screen.

Rick McCallum says that they "wanted to avoid the mythology of the [re-recording] mixer in Hollywood, where they might make exorbitant money for a week [because of overtime]. You might have the sound editors working on it for five or six months, and then someone works on it for five or six weeks and gets all the credit. Whenever I was in doubt about anything, I would speak with Skywalker's general manager.

Gloria Borders. She is so knowledgeable and helpful and understands the way we like to work."

The re-recording crew for *Episode I* was Gary Rydstrom on sound effects, Tom Johnson on dialog and Shawn Murphy on the music that he recorded at Abbey Road. As a team, with

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some variations, they've worked on such "small" films as *Jurassic Park*, *The Lost World* and *Titanic*. Burt had been re-recording mixer on all of the films he had supervised between 1983 and his "retirement" in 1989, and had to decide whether he would return behind the board. "When Rick and I planned things out two years ago, I thought since I was picture editing that I couldn't decide how my time was going to be divided up," he explains. "I hadn't mixed for a long time and didn't know how to use the new console. The first thing that occurred to me was that I'd like to have that objectivity, to walk out of the pre-

mix room for hours at a time and see it fresh, hear it fresh.

"Also, I can run upstairs and rework something offline," he continues. "I know we're going to have new special effects shots in the last moment while George will be making changes. And to be honest, I was worried about how much energy it would take to bear the whole load. We have mixers here who are excellent, and it seemed sensible to utilize all the talent that we can. As I've discovered passing things along to the other editors, it's good to have that partnership. It's your ego which says, 'Technically, I can do it all myself,' and then

reality says, 'What's best for the movie?'"

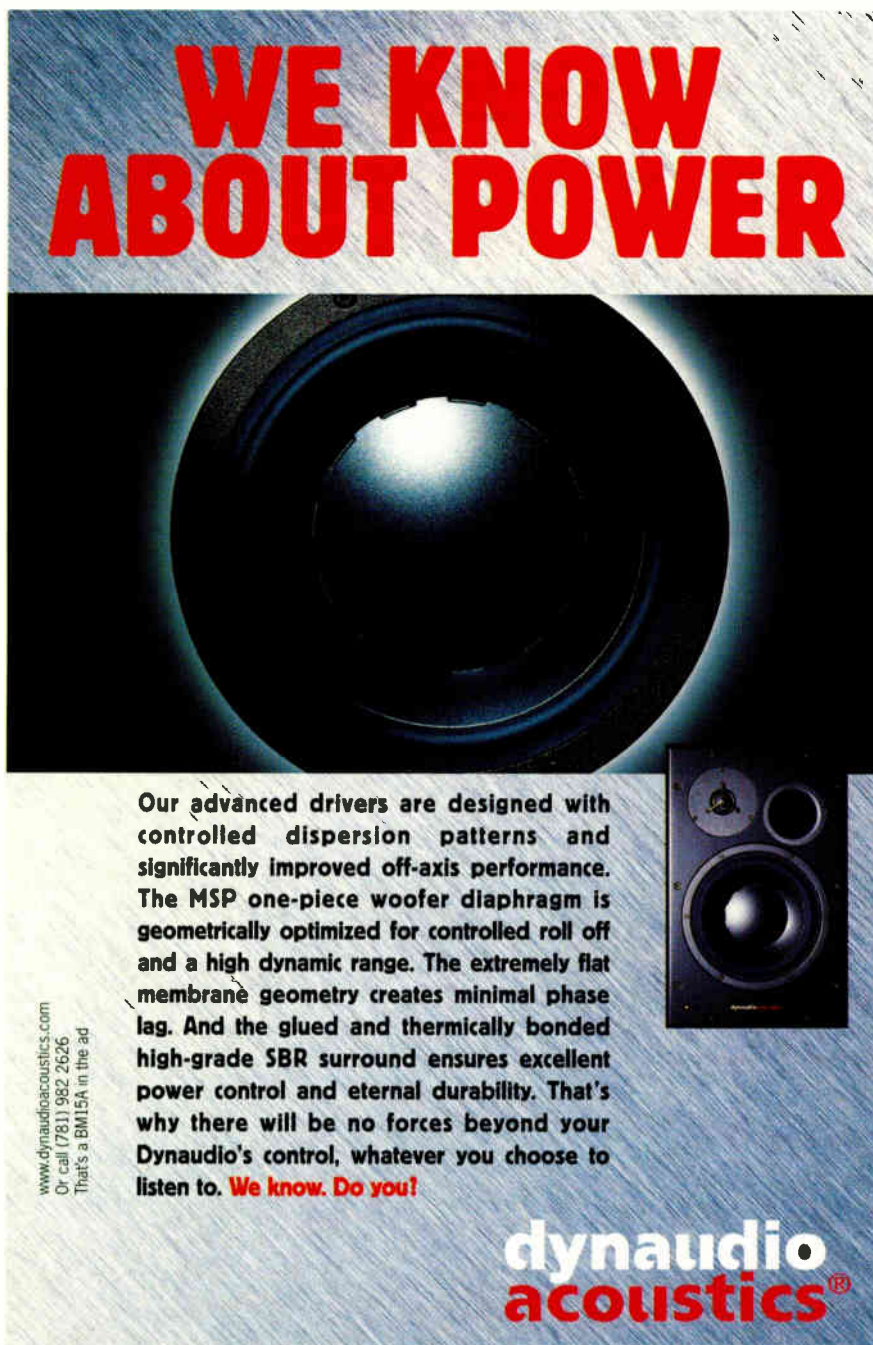
The mixing schedule had Rydstrom and Johnson starting four weeks of pre-mixing the second week of February, followed by five weeks of final mixing, including three weeks of fixes and changes. By any standards, this is a comfortable schedule, and as a result there was virtually no overtime or weekend work. Rydstrom was based in Mix A, which features a 176-input Neve Capricorn, while Johnson pre-mixed dialog and Foley in the smaller Mix B, recently refitted with an AMS/Neve DFC. All re-recording—pre-mixing, final mixing and print mastering—was done to Tascam MMR-8 digital dubbers, recording 24-bit Pro Tools files. (All work for the film was at the 44.1kHz sampling rate, with all of the source dialog and effects elements at 16-bit resolution.)

Burt designed the effects premixes into eight groups, A-H, with Rydstrom having seven tracks (left/center/right/left-surround/back-surround/right-surround/boom in the Dolby Surround EX format; see sidebar) on an MMR-8 dedicated to each. A and B were usually checkerboarded backgrounds, while C-H would contain spaceship-bys, afterburners, explosions, etc., kept separate when possible. There was, of course, variance for reels such as the pod race in 3AB and 4AB, where the steadys and pass-bys of different pods would have their own premixes.

During effects pre-mixing, Rydstrom would have five MMR-8 recorders online, and Eckton or Scarabosio would sequentially solo into the 24 outputs whatever pre-mix Rydstrom wanted to see. (He was always mixing in context, i.e., with other premixes playing back in the monitor.)

Rydstrom says, "Ben is so organized. He makes a lot of choices in the sound design stage, even before editorial. You don't have duplication or choices or a lot of weeding to do because it's well thought out, and George has listened to what Ben has been doing all along. On this film they have tried to do the ideal that we always talk about: sound being done along with the rest of post-production. It's a long evolving process, and you don't have to scramble to make all of these decisions.

"I think the more decisions you make in the editing and pre-mix stages, the final mix becomes a place for global decisions. You don't want to be making too many detail decisions in the final mix because that's when you have people sitting around waiting. It's the most expensive part of the process."



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Rydstrom says the Capricorn is a "great console, but we're constantly running into limitations in terms of memory and size of the automation itself. I like the interface and the board, but it was really designed for music, and when you expand it out into a full-fledged final film mix board, you run into some problems that you wouldn't have anticipated. To get around this, we break the automation for the second half of reels."

Two items recently were added by the Skywalker Sound engineering staff to the Capricorn to bring it up to spec with film mixing boards. First was three (one each for dialog, music and effects mixers) sets of outboard input/repro and record keys, designed by Paul Key. These units allow not only control of an individual multitrack group (say an 8-track stem) on one set of keys, but also the ability to explode that group out for control of individual tracks.

The second modification was a Nexus digital router by Cantus/Stage Tec of Germany, which routes the console's buses to the recorders and to the input side of the keys, and the recorder playback returns to the repro side of the keys, in addition to monitor summing. Previously you had to use up faders on the console to assign them to the monitor buses, which was not only inefficient but potentially dangerous.

The picture in Mix A was supplied by an Electrohome VistaGRAPHX Model 7000 Roadie DLP projector, costing somewhere north of \$100,000. When Martin Smith first went into Mix A and saw the quality of the image, he exclaimed, "Wait! What happened to all of the streaking images!?" The direct serial feed was from a Doremi VIB digital disk recorder, which recorded the picture from the online DigiBeta master. The VIB has a variable compression rate from 2:1 to 4:1, resulting in approximately 6 gigabytes for each large AB reel. "Having the digital picture is an amazing timesaver to be able to jump throughout a reel to do a fix," says Rydstrom.

The mixers at Skywalker Sound have had a long and fruitful relationship with 35mm mag, being especially fond of their

Sondor recorders. Rydstrom believes that the MMR-8's sound quality is more consistent than mag, and, combined with the fact that the console is digital, made the decision to record digitally a no-brainer.

The existence of all sound elements—both cut units and premixes recorded on the MMR-8s—on the Pro Tools platform made conforming the sessions to picture changes a snap. (However, because the premixes were 24-bit, the conforming could not be done together in the same session.)

An unexpected problem arose when Rydstrom and Johnson wanted to go back and fix premixes after they had been conformed. Everyone at Skywalker soon discovered that you can't do this until you "tape convert" the edited files back into reel-length contiguous files. Tape converting is a sister of the MMR-8 "tape mode" that is used during re-recording, resulting in single files that can be punched in and out of *ad infinitum*, just like a multitrack tape recorder. The down side comes from the fact that you need to dedicate space on the disk for a whole track, regardless of how much you actually need.

Because Skywalker chose to standardize on 4-gig drives, devoting a drive to a single 8-track reel, one or two generations of tape converts could be stored on the original drive. (The longest reel in *Episode I* is over 1,800 feet, which means that it lasts about 20 minutes, and at 8.2 Mb track minute, each version takes up 1.4 GB.)

An average of 128 premixed tracks would appear at the console during the final mix, including 56 tracks of effects, 16 of Foley, 16 of dialog and ADR, eight of creatures, and 32 of 24-bit music recordings and mixdowns. (For quick historical perspective, Episodes 4-6 were all mixed on consoles with fewer than 33 inputs.) In addition, there were console inputs dedicated to four Foley sweeteners, eight effects sweeteners, and four dialog sweeteners, each fed from tracks at the top of the original premix Pro Tools sessions. Effects, music, Foley and creatures each had full Dolby Surround EX 7-track stems,

—FROM PAGE 50, DOLBY SURROUND EX

"We also do something to help pull sound off the screen: If a spaceship is going left-to-right, at the peak of the pass-by in the center, I pull it back to the [center rear] EX channel, over the audience and back to the right. We do a similar trick with the seeker balls that hover over you. Putting a little bit in the center-rear really helps the illusion, a cheap 3D trick." Rydstrom says that he got "lucky" with the automated joystick panners on the Capricorn in Mix A: "It turned out that the panners had the IMAX top-center speaker output in exactly the position we wanted for Surround EX.

Ben Burt says that he left all of the decisions regarding exactly how cut material would translate to the three-surround format to the mix stage. "Doing proper split-surrounds in a small room, and making wise decisions about it, is not efficient. Despite the fact that we have voiced my work room, I still have difficulty making the translation from a small space to a big space. Technically it all measures out the same, but...

"This is where I depend on Gary Rydstrom heavily because he has so much experience and creativity doing complicated surrounds. I think it's something that he can do better."

The cost and trouble for theaters depends, of course,

on their current setup. Kurt Schwenk, Director of the Professional Division of THX, says that a number of THX theaters are set up so that only the installation of the Dolby Digital Surround EX unit is necessary. Such a theater would have direct runs of speaker cabling from individual surrounds back to their amps in the booth, and stereo surrounds configured in an L-shaped array from the sides into the rear wall, where an even number of speakers are located.

As of press time, it's anticipated that over 2,500 of the 4,000 screens showing *Episode I* on May 19 will play the film in Dolby Digital Surround EX. The number of screens showing the film with three surround channels will be higher, though, since companies such as DTS and Smart are making similar units. Gray says that Dolby has six encoders built and ready for use by re-recording stages.

Even before the film opens, the vernacular has termed Surround EX to be a 6.1-channel system, which it really isn't since it uses matrix encoding and decoding to derive one of the speaker channels. Gray says that he doesn't like the 6.1 nomenclature because he "spent a lot of time convincing people that 5.1 was discrete, where 6.1 is not. I try to be extremely careful in not referring to it as 6.1 because it's a misnomer." Nonetheless, he admits that it's probably a lost cause.

—Larry Blake



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while the dialog stem was six tracks, and no boom.

## THE CLONE WARS

The basement of the Technical Building at Skywalker Ranch contains three SGI Origin 200 UNIX servers, each storing over a terabyte of data. One is used to back up data the sound editors are allocated for each show, plus shared digital video files, and mix materials from the MMR-8s. Although the server can stream a given video "reel" to eight edit rooms simultaneously, editors usually load the reels they want to a local hard drive. A second server is dedicated to the sound effects library, which currently holds effects dating back to Burt's original recordings in the mid-70s for the original *Star Wars*. The third is reserved for immediate backup of the other two.

At the end of each mix day, all drives that have been recorded or updated are placed in a drive stack in the machine room, and backed up to its server utilizing Legato's Networker. The server itself is backed up by a DLT7000 robot changer. In the few instances that MMR-8 drives have gone down, they are restored in less than ten minutes from the server's drives.

When a film is finished at Skywalker Ranch, it is customary do a UNIX-style dump to DLT tape of all files associated with that project. According to K.C. Green, Skywalker's manager of information systems, "As long as some form of UNIX exists, which is a certain bet, they'll be able to restore these tapes. We can't say that in ten years Pro Tools 4.3 will be viable." He says that most films [prior to the use of the MMR-8s as mix recorders, it should be noted] fit onto a single 35GB DLT 7000 tape. "It's usually pretty underwhelming," he notes.

It's a fair bet that 99.9% of moviegoers will know nothing of the level of care and detail that went into the preparation of *Episode I*, nor should they. As I visited the Ranch in early January, and again in late March during the final mix, there was a prevailing calm throughout the Technical Building. A palpable buzz, yes, but prevailing calm. The goal of feature filmmaking is to create a seamless experience, and *Episode I* promises to be all that and more—*overwhelming*, in fact. The magic is on the screen, and the Force is alive and well at the Ranch. ■

*Larry Blake is a sound editor/re-recording mixer who lives in New Orleans. His latest film is The Limey, starring Terence Stamp, who plays Chancellor Valorum in Episode 1.*



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MaryPat Plothner, first assistant editor, and Martin Smith, G.B.F.E., who shared editing duties with Ben Burt.

## ILM, DIGITAL DAILIES AND THE AVID EDIT

**R**arely will you view the end credits of a film and see the same name pop up for film editing and sound editing or mixing. Walter Murch, a close friend and collaborator of George Lucas, has done it most of his career, culminating in a double Oscar for *The English Patient*. Now it was Ben Burt's turn.

On *Episode I*, Burt managed to beat his record of continuous employment on a film (set, of course, on *Episode IV*, aka *Star Wars*) by a good nine months. His involvement began in August 1996 in the early stages of pre-production, helping Lucas previsualize his early script.

"David Dozoretz, previsualization effects supervisor for *Episode I* had made animatics from the storyboards of many of these sequences, and I started by cutting them together," Burt says. "When you do that, you immediately see what works and what doesn't. This was an important process for George because ultimately he was going to have to pay a tremendous amount of money for each second of film, and you darn well better know as a director going in what you need to shoot. The fights and chases, the battles, going through an enchanted underwater city—he wanted to have a cut version of them in some form before he started shooting.

"I did this for ten sequences in the film that needed that kind of treatment," Burt continues. "If I can go in one day and cut ten shots out of a sequence and it will

still work, if each of those shots cost \$100,000, it certainly more than paid for my salary on this film from a producer's standpoint."

Producer Rick McCallum notes that in most cases "ILM [Industrial Light & Magic, Lucas' visual effects house] has to come up with concepts, and they are the strongest force. That takes time. Prior to this, most effects-driven films have had 500 or so shots. We have 2,000."

Higher math shows that of the more than 2,200 shots in the final film, only about 200 of them were complete as photographed during production, without any need for digital enhancement. Nevertheless, these were also digitized at ILM and then output back to film, for two reasons. First was consistency of look and, thinking of the future, consistency of film stocks that make up the cut camera negative. When Lucasfilm, with McCallum, went back to restore Episodes IV-VI for the 1997 re-release, one of the problems was that the production stocks had aged differently than the lab stocks, with shifts in color and grain. The second reason was to take advantage of the more precise color control afforded by the processing at ILM, as opposed to film laboratories, which now, as always, adjust only the three primary colors. The video realm affords control over secondary colors, black level, etc.

### DAILIES

*Episode I* was photographed in the 35mm anamorphic widescreen format. (Anamorphic lenses on the camera

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"squeeze" a wide image onto normal film, with lenses on the film projector unsqueezing the image to the original wide aspect ratio.) During telecine, the image was partially unsqueezed and transferred to 16x9 anamorphic video (whose squeeze ratio is less than film's 2:1). When the material was played in the edit room on the Sony 16x9 "director's monitor," the monitor would unsqueeze the remaining amount and editors would see the correct 2.40:1 anamorphic ratio with small bands on the top and bottom of the 1.78:1 ratio tube. If the image was viewed on a standard 4:3 television, as was the case for most of the sound editors, the image would look compressed. When sound editors really needed to see hard left and right, such as for critical sync with Foley, they were provided with a 16x9 monitor. The decision to use the 16x9 format was partly to use as much of the scanning area as possible, and it had the side benefit of conserving space on the hard drives.

At Midnight Transfer in London, Neil Harris was in charge of transferring the 35mm negative to tape. His relationship with Lucasfilm and McCallum dates back to *The Young Indiana Jones*

*Chronicles* in 1991 and continued on the feature *Radioland Murders* a few years later. "He's not just a colorist or a transfer operator; he's a true artist," McCallum says.

Dailies ("rushes" in the UK) were recorded both to Digital Betacam and to removable hard drive using the Avid MediaStation. The DigiBeta tape was "clean" and did not contain any of the visual burn-ins on the Avid drives such as videotape timecode, production ("Nagra") timecode or key numbers referencing the camera negative. (The fourth possible window, inked Acmade edgocodes referencing the positive workprint, was not available on *Episode I* because of the negative-to-tape procedure.) All of the "data" was encoded into the vertical interval of the DigiBeta tape, so that it could be used to redigitize into the Avid or create dubs with burn-ins. Key numbers and videotape timecode were on one pair of VITC lines, and production timecode on another.

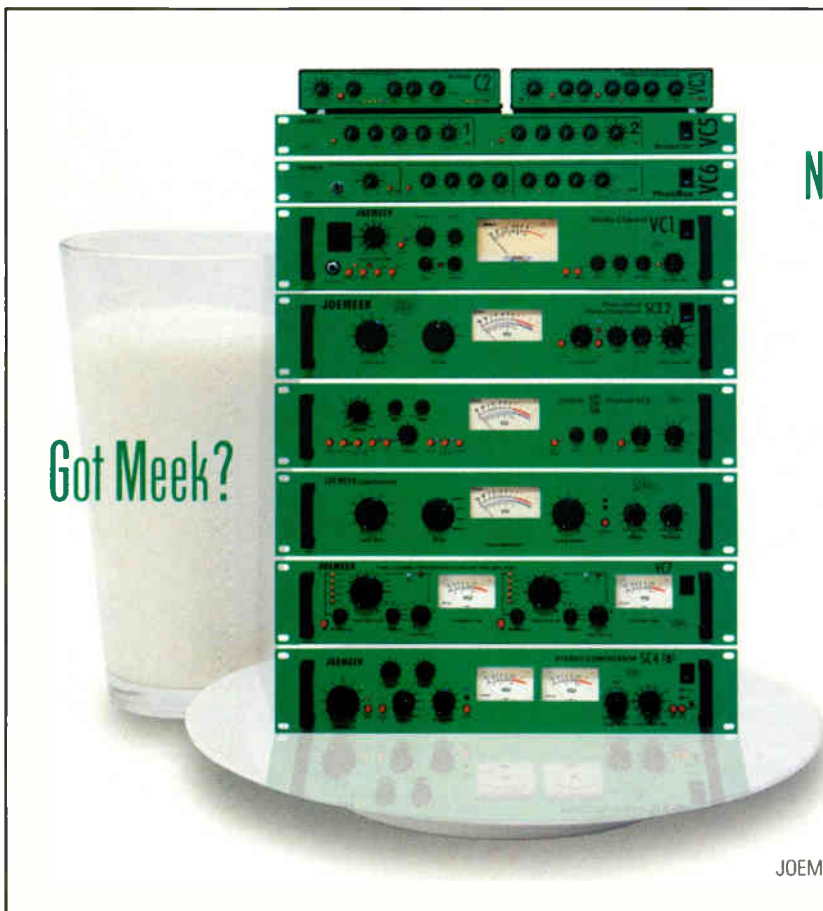
Because the timecode on production sound mixer John Midgeley's DAT tapes matched the machine-readable timecode on the edge of the processed negative film, synching was virtually automatic at telecine. There was no off-

set other than an overall setting to delay the sound to account for video processing such as noise reduction and color correction. Harris notes that on a few occasions there was drift between DAT and film, but these were rare.

Dailies were viewed by Lucas on a Digital Projection DLP projector being fed by the DigiBeta master. All told, more than 1.3 million feet of film was shot, totaling 240 hours of material. "The computers were loaded down and Avid kept telling us that you can't put on that much material," says Martin Smith. "Jaime Estrada and other Avid field guys in London broke all the rules to make everything work for us."

#### EDITING AT THE RANCH

Once principal photography wrapped up in September 1997, the picture department headed back to the Main House at Skywalker Ranch, their home for the 20 months of post-production. Even compared to medium-budget Hollywood films, the picture editorial crew was small—seven people, including first assistant editor MaryPat Plotner. Smith says that "she greased the wheel during the whole process to the point that it became totally unnoticeable how much



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world radio history

work was actually being done, and therefore allowed the creative juices to flow without interruption. Every day MaryPat and the rest of her crew saved my life."

Burt and Smith had worked on *Young Indy* together, and Smith notes that "it became apparent with the volume of material and the amount of [visual] effects that we were doing that we needed to have George switch between two cutting rooms. He'd cut with me for a week or so, and then he'd move over and do some sequences with Ben, which would give me the chance to work through effects and pass them off

to ILM. That worked out superbly well."

Burt recalls that "George and I decided that there wasn't time to do even a good temp mix for the first screening. We had our first screening with nothing but the dialog on the set! It was the first time that we had done that, because it exposes the movie in all of its raw visual nakedness. We know the role that music and sound effects are going to play, but it was a complicated story that could have easily been three hours long based on the footage shot. It was hard to take, but it did allow you to say, 'Does the story make sense? Do we know where we are? Do we like the

characters?'"

Smith says that near the top of his wish list is for Avid and Pro Tools to talk with each other more, especially considering the fact that Avid owns Digidesign. "Pro Tools has to redigitize a digitized picture? Come on!" he exclaims.

"The integration of sound and picture is so overlapped right now, although it's not yet quite precise enough," he continues. "Information about what my Avid is doing needs to get down to the sound department in a better way than sending a piece of paper or picking up the phone. I want them to be able to see my timeline, so that I can locate specific shots for them and they can flag it back to me saying that they've taken care of it. Any change that I do to the timeline should have a red flag come up indicating what has changed. I want Ben to be able to look up shots over there [in the Tech Building] to see where it's changed at any stage."

After first or second cut, all material was consolidated, meaning that the Avid made new files of exactly the material used, plus handles to allow for some flexibility. By eliminating the heads and tails of those shots, and everything from those not in the cut, hundreds of megabytes were freed up in the Avid to make way for the avalanche of opticals in various forms that would be coming in from ILM.

Mix B, the AMS Neve DFC room at Skywalker Sound, had a feed from Smith's Avid in the Main House, to allow Lucas to keep up to date with the edit and with late-breaking opticals. "If ILM has a shot that's come in, and they're desperate to film it out, I want to be able to get on the phone with George so he can take a look at it," Smith explains. At other times during the final, Mix B provided a *Truman Show*-style look at whatever Smith or his assistants were doing at any moment.

As more and more shots were output to film, a workprint was being created. In order to give the sound department the highest-quality output at a given moment, both the conformed workprint and the current Avid output were transferred to DigiBeta, then combined in an online edit session. Burt says that in some ways it's worse than an Avid output by itself, because "you intercut a beautiful shot with a horrible, purple, pixellated shot. But we're used to it, I don't even see that stuff any more. I've accepted it as a film style."



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# MUSIC FOR

John Williams' first three *Star Wars* scores are instantly recognizable throughout the world, a part of the common musical lexicon. Listeners need less than a dozen notes to recognize the opening of a *Star Wars* movie, the entrance of Darth Vader or the heroics of Luke Skywalker. For *Episode I*, Williams joined with scoring engineer Shawn Murphy and music editor Ken Wannberg, both longtime associates, in Studio 1 at Abbey Road and crafted what is sure to become another classic.

## John Williams and Shawn Murphy With the London Symphony Orchestra

Wannberg first worked with Williams on 1968's *Valley of the Dolls*, and has worked on all of his big films since, including all three *Star Wars*, the three *Indiana Jones* movies, *Jurassic Park*, *Schindler's List* and so forth. Only Williams knows exactly what he wants, but, of the rest of us, it's fair to say that Wannberg has the best guess.

Williams and Wannberg began by spotting the film, such as it was, with George Lucas at Skywalker Ranch. *Phantom Menace* has some 2,000 computer-generated/enhanced shots, so a great deal of the picture was missing from the early print. Still, says Wannberg, the print was more complete than the print used when they spotted the original *Star Wars*. By the time all was done, there would be over two hours of music composed for the film.

Back in Williams' offices at Steven Spielberg's Amblin Entertainment in Los Angeles, after the spotting session, Wannberg noted start and end times and duration for each cue. Each cue was broken down into seconds, noting all cuts, dialog and action. That is what Williams writes to. It was important to note what video was used for each given cue, because updates regularly came in as picture continued to be edited.

"He has to write a minute-and-a-half of music a day to make the schedule," says



George Lucas and John Williams  
at Abbey Road

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and noted the changes. Up to this point, Wannberg's job was mostly administrative, but now he had to evaluate which cues could be reconformed with editing in post-production and which required revision by Williams. As a consequence, Williams and the London Symphony Orchestra would record music that did not always fit the picture at the time of the session.

First-call scoring mixer Shawn Murphy began discussions with Williams and Wannberg in late September, bringing ten years' history of collaboration (*Jurassic Park* and *Schindler's List* are but two examples). Sessions were booked at Abbey Road Studio 1 in London, a room Murphy has worked in often. Consequently, his preproduction was brief but comprehensive.

"My contacts are typically with the sound crew at Skywalker," Murphy explains. "I spoke with Gary Rydstrom and some of the



Shawn Murphy

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# THE MENACE

BY LARRY THE O



*John Williams conducts the London Symphony Orchestra*

engineering crew about what format we'd be working with once we got to the final dub. I've worked at Abbey Road so much that I don't have to be very detailed because the assistants there know what my standard orchestral setup would be. And it was going to be the London Symphony Orchestra, nothing in the way of peculiar instrumentation. It was pretty straightforward."

Murphy and Williams both knew that the score would have to be recorded in a way that would translate into impact and immediacy. "We were looking for a natural acoustic," explains Murphy. "It's a summer picture, primarily action-oriented, there's a lot of brass and percussion, so our approach acoustically needs to be versatile enough to retain some control while still [making] an orchestral picture 'stick to the screen' adequately. It has to have some flexibility, where we could make it a little more lush, through processing, for the CD, and keep it a little less lush for the picture because it has to be able to hold its own against some pretty large-scale effects material."

That flexibility was gained through classic sound engineering, according to Murphy: the right mics, positioned correctly, with proper seating and a great

composer/conductor for the right balances. "On our main mics we might be a little closer, we might not let it be as far back in perspective as we would [for other projects]. Studio 1 is fairly bright, which means overall EQ isn't going to be needed in the top end because of the room's characteristic. For the seating, I try to maintain a wide

Murphy, Lucas, Rick McCallum, the LSO and a 92-voice choir filed into the cavernous Studio 1, whose history spans Sir Edward Elgar's opening of the facility in 1931, through The Beatles (who used Studio 1 for their orchestral work), and on to the past two *Star Wars* scores. The room has hardly changed since the Beatles years, mostly because Abbey Road's classical clientele, like Murphy, become uneasy whenever the subject of reworking the room comes up.

**DECCA TREE, SURROUNDS**

Murphy's orchestral miking scheme is built around a modified Decca Tree arrangement, with the main room pickup of three Neumann M50s on the tree, plus a pair of string boosters on the wide left and right sides—in this case AKG C12s. The "surround mics" are usually "tipped-up" omnis (omnis with a rising frequency response for distant-field pickup): Sennheiser MKH20s with the top end tipped up, B&Ks tipped up with the bright grid on them, or a



*Above: Shawn Murphy kicks back while producer Rick McCallum chats with George Lucas in Studio 1's control room. Right, music editor Ken Wannberg.*

PHOTO: © STEVE JENNINGS

perspective but limit the depth, because if you can control the depth from the main mics to the woodwinds and percussion, you won't need to use spot mics as much, and it helps pull it more toward the screen in a beneficial way."

On February 5, Williams, Wannberg,

Schoeps MK3.

"The variables you have with the main trio of mics are depth into the orchestra, spacing of the mics, height of the tree and angulation," Murphy says. "At Abbey Road the tree height generally resides between 10 or 11 feet. It's quite critical—you can actually jiggle your way in between 10 and 11 feet and hear dramatic differences. In this case, the tree ran at about 10 feet, 6 inches. Usually for film, I try to line up the back arm of the tree, the M50s, at about the split of the first stands of violin and cello, so they're in a little bit farther than where it would be for a classical recording. The spacing on the rear M50s was 42 inches, front was 36 inches from the back bar, and then 12 feet out on either side were the C12s, six inches lower than the tree and angled a little more into the orchestra, as opposed to flat over the strings, so they were picking up a combination of horns and strings on the left, brass on the right.

"I used a wide cardioid pattern [on the C12s]," he continues. "Big capsule omni is obviously not the best thing in the world because you have anomalies. The pattern is not even and your off-axis response tends not to be attractive, but wide cardioid tends to be much

**SPOT MIKING**

Woodwinds were miked with a combination of Schoeps cardioids and hypercardioids, which went directly from the mic preamps to tape. Horns were covered by an AKG C24 stereo mic, bused to mono, as it was being used for angular pickup, as opposed to stereo. Brass had a U47 for overall coverage, with a pair of U67s on the trombones (bused to tape), a TLM170 on tuba (straight to tape), and a Coles 4038 on trumpet, also going straight from the preamp to tape.

Percussion was covered with KM84s, except for bass drum, where a KM83 or a Schoeps omni is used. Murphy buses the percussion according to its position in the room: "I tend to do that with percussion: I'll select left, center and right, or multiple left, center and right busing, so that, wherever it's bused, when I remix it automatically appears in the right position in the room, so I don't have to remember where things were." Timpani are miked with a U67 going straight to tape.

String spot mics included a U47 on the first chair bass, B&K 4011s on violins and violas, a U47 on the cellos, and a KM54 tube on the harp. For keyboards, a pair of Schoeps cardioids were on the piano and a TLM170 was on celeste.

—Larry the O





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## MUSIC FOR THE MENACE

more even on a large-capsule mic. On the C12s, you have gradients on the pattern selector: cardioid, omni far left, figure-eight far right—you can basically step your way toward omni. We find that we go one step less than omni on those wide mics."

Murphy usually places the surround mics in the audience perspective, about 30 feet from where the podium would be, but at Abbey Road he couldn't go back quite that far. "I try to get them up as high as I can," he says, "20 to 25 feet if possible, spaced about 30 feet apart, pointed straight out into the room. Basically, they're looking at the distant pickup ambience of the room."

### PREAMPS, PROCESSING, RECORDERS

The main mics were plugged into Millennia Media preamps, which were then fed directly to two Studer 820 2-inch analog 24-tracks, run at 15 ips with Dolby SR. Ampex 456 tape was used, calibrated to 320 nWh/m, Abbey Road's standard calibration, but somewhat hotter than Murphy's usual level.

The preamp outputs were nomaled through the patchbay to the console so that Murphy could flip the bus/tape switch on Studio 1's 64-input Neve VR and go back and forth between monitoring the machine output or listening directly to the preamp.

Spot mics were fed through Grace, Boulder and a few GML preamps. "I like the Grace preamps for spot mics in that they have a slightly softer characteristic and they're particularly good with ribbon microphones," says Murphy, "and the Boulders are kind of an old standby for me for brass and horns. I like the characteristic of a tube mic going through a Boulder transformer preamp and then straight to tape."

No dynamics or console EQ was used, but Avalon 2055s were used on the mix buses for overall EQ: "A little bit, maybe 2 dB, of top-end boost, as high as it will go, which on the Avalon is over 20k, I think, a little bit of low-end boost, like 2 dB at 15 Hz, and a dB out at 600 Hz, just for clarity."

All of this was printed to the 24-tracks, with a separate 8-channel, 24-bit mix printed to two Genex MO recorders (a master and a safety) through Prism converters. The same

mix was piped via AES/EBU to a Yamaha 02R, where a stereo submix was created for the CD and printed to a 24-bit Nagra-D recorder, as well as a 24-bit DAADR-5000 sent over by Sony (the score will be issued on Sony). Several DATs with Genesis converters received another 2-channel mix. The DATs were fed analog because there wasn't a convenient method at hand of dithering the 24-bit mix down to 16 bits. The Nagra-D mix was also used for conductor and music editor headphones. Murphy relied on experience and careful phase-checking of microphones and the signal path to ensure 4:2:4 (Dolby Surround) compatibility. Everything was recorded at 44.1 kHz to be compatible with Skywalker Sound.

According to Murphy, the live 8-track Genex mix ended up being used for 95% of both the film and the CD. The eight tracks were: left, center and right orchestra; left, center and right synthesizer/choir/solo instruments mix; and stereo surround channels. "The surrounds consisted of the two mics I described, plus an addition of the reverb returns from the discrete left-center-right reverbs that were added to the close mics of the orchestra," Murphy

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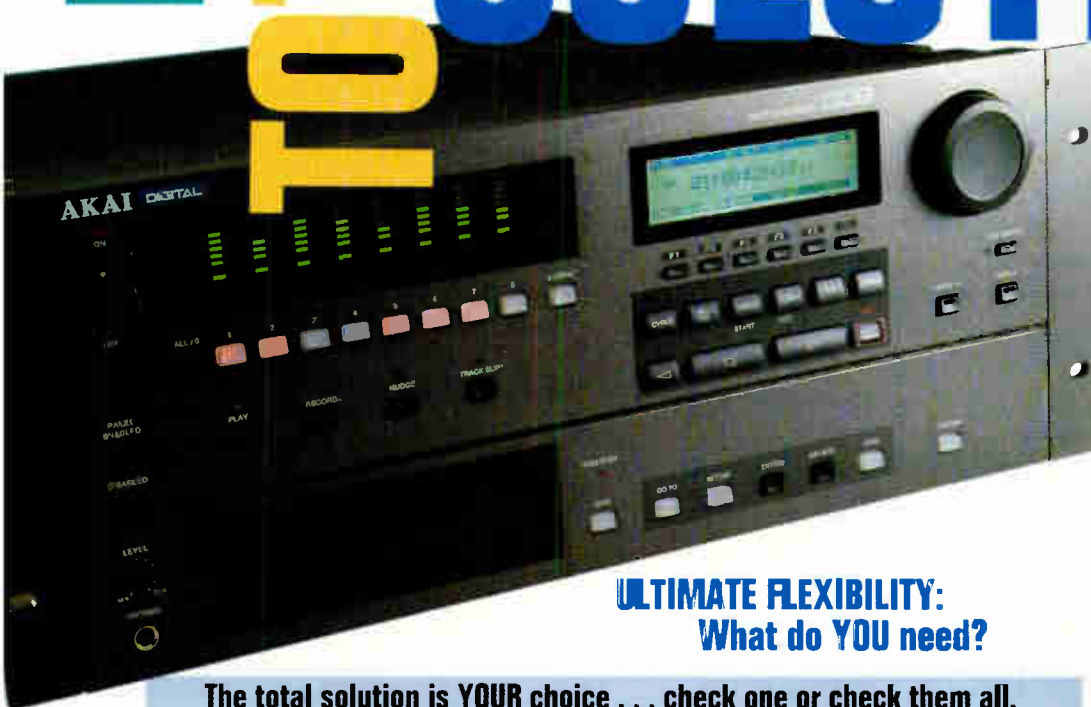
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## MUSIC FOR THE MENACE

explains. "Lexicon 480s were used for that, the synthesizer used a [Lexicon] 224XL, and for the solo instruments—flutes, pennywhistles, that sort of thing—we used a Lexicon 300. In those cases, after returning the reverb to the console, I assign a couple of aux buses that feed the surrounds directly, so that I can basically just tweak the reverb return to surround selectively."

### THE MURPHY METHOD

Williams' working method calls for printing mixes right away. "John likes to rehearse the cue once or twice, then make a take and listen to a playback, and I think it's very effective," Murphy says. "Everyone will make the appropriate notes to their parts, and then they'll go out and make a couple more complete takes, maybe even three or four, depending on the feel."

Spots that were not satisfactory in the complete takes were recorded as pickups, where Williams relies on his internal sense of timing and a sweep-hand clock. "John puts landmarks on his score by clock time and sets the tempos in his head," Murphy explains. "He's looking at the picture, and there's streamers on the picture to mark where important points are to be met, but the timing is internal and is based on clock time, so his most important synchro-

nization point is the sweep-hand clock in front of him."

As Williams works through the rehearsals, Murphy gets his levels and mix going. While the first take is printing, Murphy is running an initial pass with the VR's automation. Each take or pickup thereafter, he refines the automation, printing final mixes *and* automation on-the-fly.

"When you're trying for a live mix, you're privy to conversations taking place between directors and composers and editors at the time of the scoring session and you react to that in your mix," he says. "The director says, 'It would be great if I could hear more of that flute,' or 'That drum wasn't so loud,' and you make a mix that responds to all those things live. If you go back without automation and try to remix any of that, you're really not privy to those conversations anymore. I think that's a disaster. Why not try for the best live mix you can get and then finalize it from the point at which you stopped? If I feel, 'I misjudged the woodwinds for this phrase,' I can trim it up and fix it in a jiffy."

The few cues that needed to be mixed after the fact were done at Skywalker Sound and the scoring stage at Todd-AO in Studio City, both of which have Neve VR Series consoles. Murphy transported the automation files from Abbey Road and simply picked up where he left off.

## FIRST, THE CD VERSION

After completing mixing at Todd-AO in early March, the music team turned their attention to the CD release. Sony wanted to put the soundtrack CD out three weeks before the film release. The album was slated to hit the streets by May, so a master needed to be done *very* fast.

"To expedite that, we had the classical editors at Abbey Road take our edit notes and actually put together complete takes of each piece of music on their Sonic Solutions system in London, printing both to Nagra-D and Exabyte," Shawn Murphy explains. "Then John did a plan as to what pieces he wanted on the CD, which usually is a montage of some sort. We brought those to A&M, where we usually do our assemblies. Pat Sullivan, who is our engineer, unraveled the Exabytes, and we put all of that up in her computer and did the montage there. We mastered on her Sonic System, doing additional editorial work, montage work, a little overall EQ—using a 96k/24-bit Weiss EQ, which is the best digital EQ I've heard—and adding a little bit of ambient material because it was intentionally made a little bit close for the screen. When you listen to the whole thing put together, you tend to go into more detail on the CD because it's something you're going to hear over and over. With the film, because of the sound effects and the dialog, you might not hear a room noise or a slight blemish that's going to be covered."

—Larry the O



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## MUSIC FOR THE MENACE

The days at Abbey Road consisted of two three-hour sessions, with only one day seeing a triple session. On February 21, after 11 working days, the sessions were complete and 128 minutes of music had been recorded. Wannberg and Williams then sat down to suss out the best parts. "We have a session afterwards where we listen to all the takes and he'll do a roadmap [that marks the score to show which bars come from which takes], so there's a lot of editing to do before we even put it to picture," Wannberg explains.

At Skywalker Sound, Murphy remixed three takes from the first day to make them consistent with the rest of the recordings (which were slightly different based on feedback from the first day). Two other pieces also required remixing. The first was a choral piece where the choir was recorded separately from the orchestra, allowing the two elements to be used independently in the film. A mix of this was done at Todd-AO for Lucas' review, and a CD mix was also done at Todd-



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The other was a large parade piece, which involved substantial overdubbing of synthesizer, percussion, a children's choir and effects, eventually totaling 44 tracks. In late March, deep into the final dub, this was mixed for film at Skywalker and CD at Todd-AO.

### BACK AT THE RANCH

By mid-March, Murphy was back at Skywalker to handle re-recording in the final dub. Two weeks later, when I spoke with Murphy and Wannberg, the mix was rolling along, with five of the reels completed. But we all know that this film is not the last of the story, and Murphy is already planning what he'll do differently next time. "We talked about the possibility of the next one being recorded in a larger venue that's more of a symphonic acoustic—per-

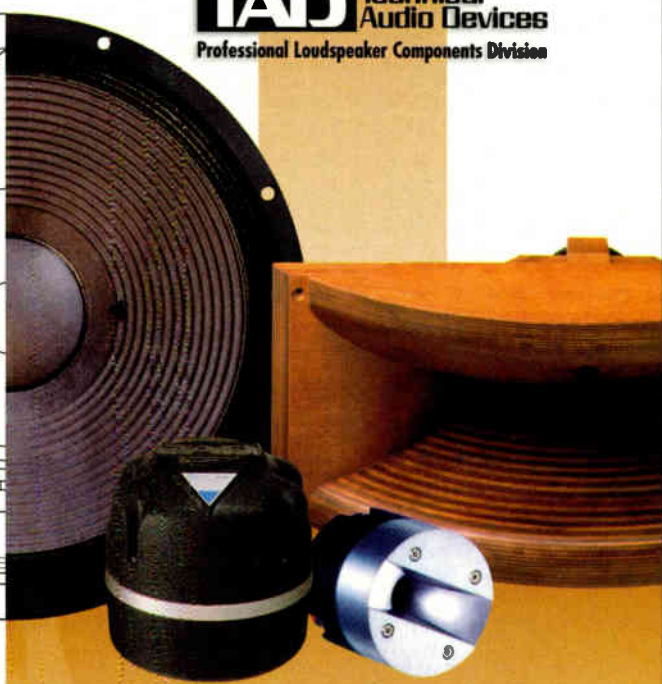
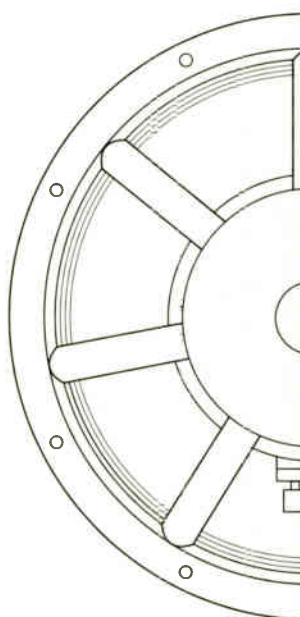
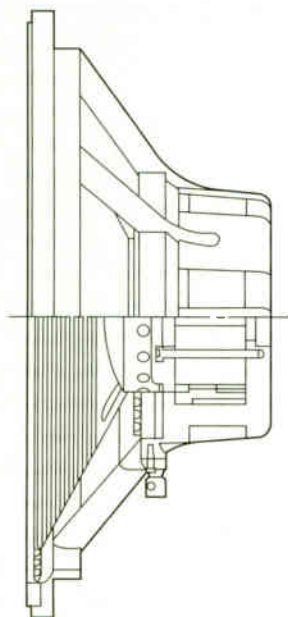
haps Watford Town Hall or something that is more of a concert hall acoustic—not much to change the perspective but to change the ambient character that surrounds the orchestra."

Oddly, however, this team faces the unique challenge of hurtling headlong into the future only to arrive precisely where they started decades before. "How's the thread going to stay put?" Murphy muses. "Musically, that's of very great interest: How do you start off with 95 percent new music in this *Star Wars* movie and wind up at *Episode IV*, the first one we all saw, making sense musically?"

Murphy disappears back into Mix A to start reel 6, but his question hangs in the air like a lingering whiff of a tantalizing aroma. This musical conundrum, which starts to unfold only a few short weeks from now, fits seamlessly with the movie's story; just one more subplot in the saga. ■

*Larry the O would like to thank Shawn Murphy and Ken Wannberg for taking time out of an intensely busy schedule to offer their insights. And thanks to Ellen Pasternack of Lucas Digital for arranging it all.*

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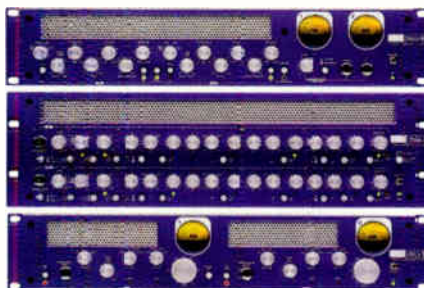


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# RECORDING ELECTRIC GUITAR

**BY BARRY  
CLEVELAND**

It is difficult to imagine what popular music in the latter half of the 20th century would have sounded like if the electric guitar had never been invented. There would have been no Les

Paul or Jimi Hendrix, no Nashville cats or British Invasion, and Bob Dylan would never have been able to "go electric." In fact, the electric guitar might be seen as the principal totem of popular culture, with millions of enthusiastic fans playing "air guitar" worldwide. Given the omnipresence of the instrument, it naturally follows that recording engineers and producers get lots of opportunities to record and mix the "six-string." We checked in with three engineers—Joe Ferla, David Singleton and Kevin Shirley—to see how they do it.

## **JOE FERLA**

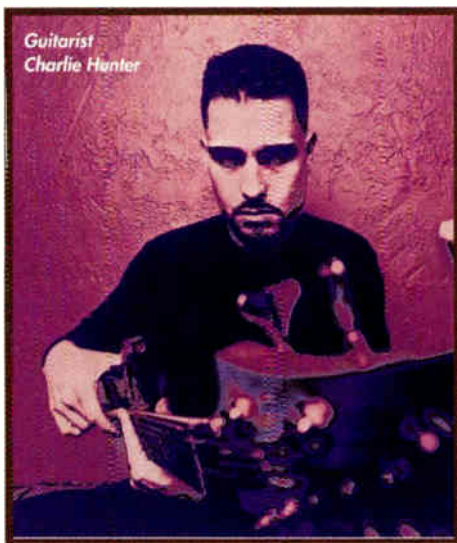
Joe Ferla, a 1995 TEC Award nominee, has engineered or produced hundreds of albums, including nearly a dozen that have reached the Top 10 on *Billboard's* jazz and pop charts. He's also engineered numerous soundtracks, and live radio broadcasts from Electric Lady Studios. His work spans all music genres, but his specialty is recording jazz artists, among them guitarists Bill Frisell,

## **Three Engineers Reveal Their Tips and Tricks**

**PHOTO ILLUSTRATION BY RON BROWN**







John Scofield, James Blood Ulmer, Bobby Previte, Charlie Hunter and Pat Metheny.

*What is your general philosophy of recording electric guitar?*

Let's assume for the purposes of this discussion that we're starting with a good guitarist, with a good instrument and a good sound at the amplifier. Otherwise, there's nothing I can do in the control room to get a good sound. I can improve upon it, but I can't get a really great guitar sound. The first thing that I do, whether it's with a guitar or another instrument, is go out and listen to the source. You don't want to hear something for the first time after it has passed through a microphone, a mic cable, a fader and a pair of speakers. If there's a really killer sound coming out of the amplifier, I'll do whatever I have to do to capture that sound.

I have maybe six different ways to record electric guitar. It changes based on who is playing, what kind of music it is, and what mood I'm in that day. Sometimes I use a Beyer M88 mic through a Telefunken V76 mic preamp, to a compressor or a limiter—an LA2A, an 1176 or a Fairchild. I recently used this combination on a rock band with big, distorted, loud guitars, and I was able to capture that sound. An alternative combination is a U67 through the Telefunken and a Fairchild limiter. That's a real retro sound—all tubes—from the '60s. Another technique, which I've used on most of the Bill Frisell records I've recorded, is Neumann KM84s through old Neve mic preamps, and LA2As.

*Speaking of Bill Frisell, last year you recorded him playing with Pat Metheny on Marc Johnson's The Sound of*

*Summer Running CD. Did you record the two guitarists differently?*

Absolutely. Pat Metheny and Bill Frisell are very different, not only in terms of their styles but sonically. Pat's got a very midrange sound, produced using four speaker cabinets arranged in an arc. Rather than miking each cabinet individually, we placed two mics a few feet away in an X/Y stereo pattern. I believe that Bill only used one amplifier on that session, though sometimes he uses two for stereo. He uses one or two effects processors connected directly to the amp and gets a beautiful and pristine sound, which I capture using the KM84s. The KM84 is one of

together in mono or stereo, depending on the circumstances, rather than on discrete tracks. I'll commit to a sound that I get because when I'm recording I'm always thinking about mixing, and I've always got a monitor mix that I think is representative of what the record is ultimately going to sound like. I like to tweak my reverbs and get a good balance. When I'm getting sounds on an instrument, I tailor them to where I think they should sit in the mix, which makes it easier to commit to combinations of mics.

*Do you print the monitor mix effects to tape?*

I never print reverb or other effects that I have added in the control room. If the guitarist is using an effect, or a spring reverb, I print that to tape. I always try

**WHEN I'M GETTING SOUNDS ON AN INSTRUMENT, I TAILOR THEM TO WHERE I THINK THEY SHOULD SIT IN THE MIX, WHICH MAKES IT EASIER TO COMMIT TO COMBINATIONS OF MICS.**

**—JOE FERLA**

the flatter condenser mics that Neumann has made, without the peak of a U87 and with a better bottom end. It's very smooth and warm-sounding.

*What other techniques do you use?*

Another technique is to combine two mics, like an SM57 and an M88. The SM57 has that midrange brightness to it, and the M88 has a fatter sound. I just make sure they're in phase and mix and match instead of using EQ. Yet another technique is putting a mic close to an amplifier, right on the cone, and another two or three feet away.

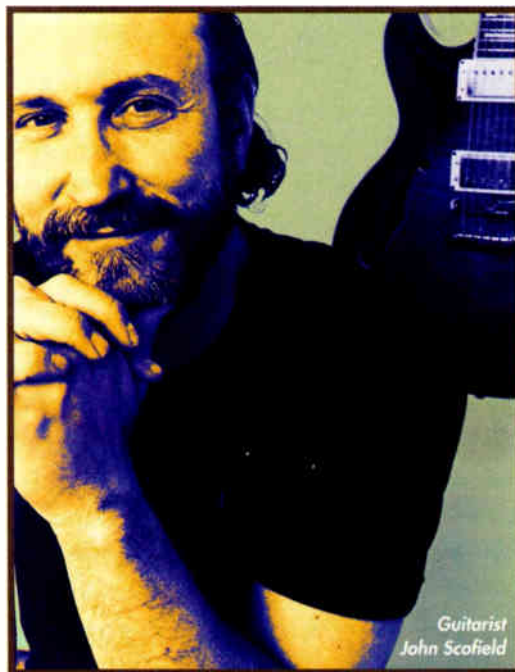
*Do you ever use room mics?*

Usually I don't record guitars with room mics because it isn't appropriate for many of the kinds of music I do.

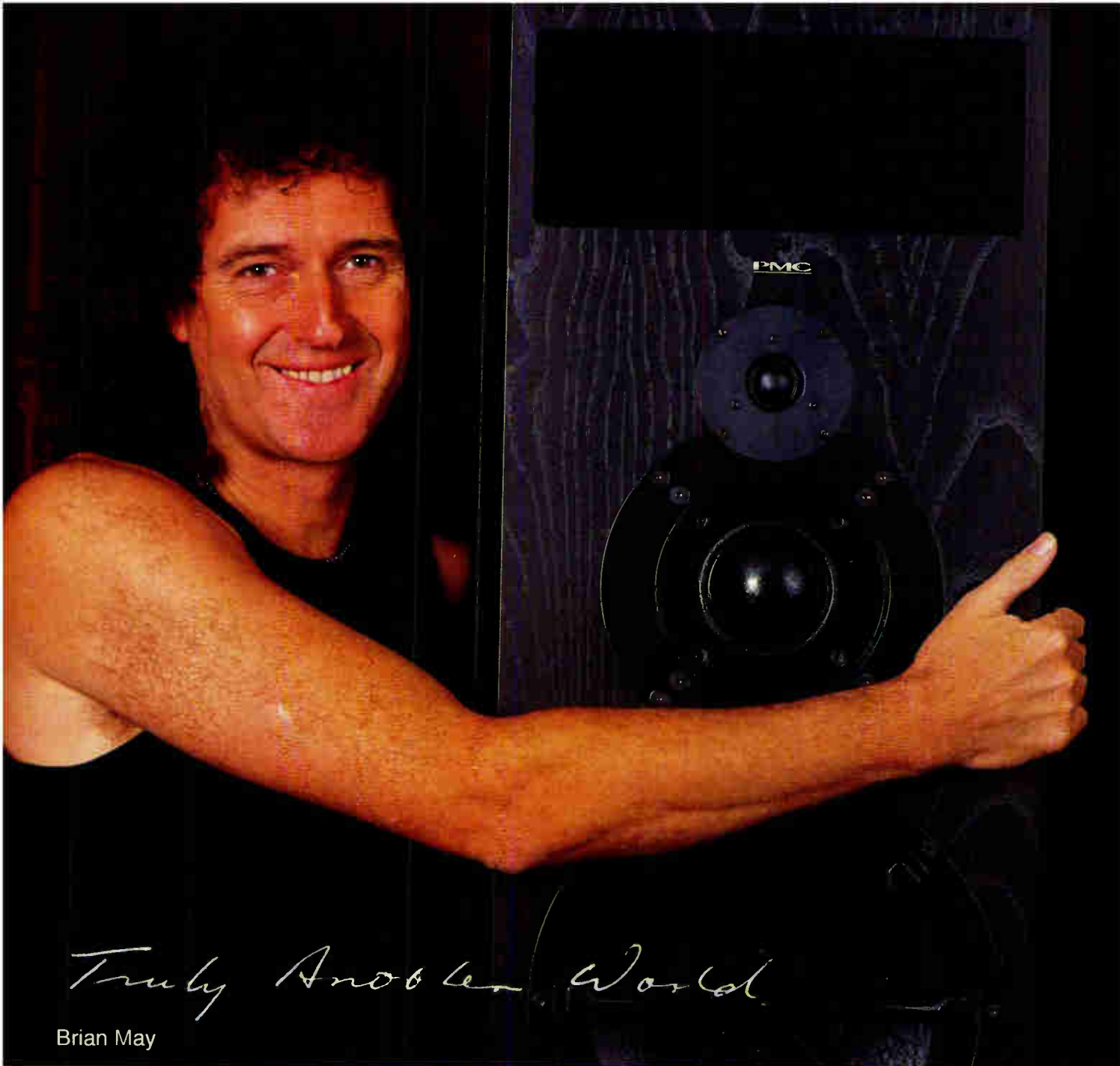
*Do you record the different mics onto discrete tracks, or blend them going to tape?*

I mix the mic combinations

to get the desired sound using microphones rather than EQ or control room effects. I'll change a microphone before I'll pop an equalizer in. I do a lot of







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running between the studio and the control room. The bottom line is that after changing mics a few times, if I can't get the sound without processing I'll put it in; but I want to make sure that I've done the best job that I can do with the microphones and the placement. The placement of a mic can really change things.

*So you just switch mics until you get the right sound?*

I think a lot about the session ahead of time, and I have a feeling about it before I begin. If I'm in a Beyer M88 mood that day, I'll set it up, but if it's not working out I'll change it quickly. I

try to do at least one new thing on each session, but if it doesn't work I'll go back to what I know will work. I like to experiment a little bit and push the envelope just as far as I can rather than do the same things every day. Trying things that I've never tried before helps to keep me on top of things.

*Can you give me a couple of examples?*

I used a Coles ribbon mic while recording John Scofield. It's not a likely choice for electric guitar, but it's a pretty fat-sounding mic, and it worked quite well on that occasion. Another example, also used on a Scofield recording, was setting up a Twin Reverb in the

mix room and using its spring reverb as an outboard processor.

*Are there any particular processors you like to use while mixing?*

I try to get what I need on tape, but sometimes I add compression or peak limiting to let the guitar speak, and to hear everything that the guitarist is doing. I'll also add a touch of EQ if a guitar needs to be brightened up a bit to cut through an arrangement, or the opposite if it needs to be fattened up, and some additional reverb. But no real tricks for me in that sense. I'm pretty much a purist.

*Do you prefer recording to analog or digital?*

Analog! There's no comparison. It's smoother, and you get tape compression. I think I hear overtones and harmonics more on analog than on digital. I think there are frequencies that we can't hear, that affect the sound of the frequencies that we can hear. Digital, which cuts off at 20 kHz, doesn't get it. Analog may roll off and not be as flat, but there is something above 20 kHz happening. Analog has more texture and nuance and is more realistic. You can almost reach out and touch the instrument when it's being played off an analog tape. Also, these new tape formulas are pretty good. I really like the new BASF 900 at +9 dB, running at 30 ips. Most of what I do is done that way.

*Anything more to add?*

I've also used 414s on electric guitars, and that's a nice sound, too.

#### DAVID SINGLETON

David Singleton has been Robert Fripp's engineer since 1989, during which time he has recorded and mixed Fripp in a variety of contexts, including the current "double trio" version of King Crimson. Singleton has also recorded ProjeKct Four, the California Guitar Trio, the Europa String Choir and Tony Geballe, as well as remixed and mastered several historic live Crimson recordings. We caught up with him at the UK offices of Discipline Mobile Global.

*What is your general philosophy of recording electric guitar?*

Recently, I have been recording totally DI. In fact, a lot of Robert Fripp's new sounds are produced using a Roland VG-8 routed to one or more rack effects processors, so they don't originate from an amplifier. Back in 1989, Robert adopted DI recording in principle, but at that time his main processor was a Zoom, which was not adequate. It's only

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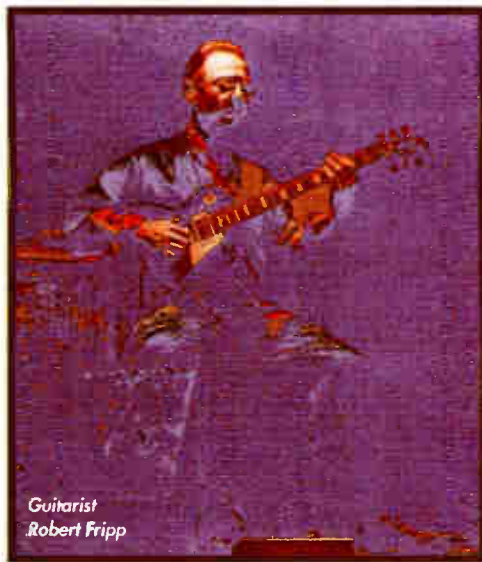
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recently that the technology has caught up and the processors sound good enough to justify using them without an amp. Robert was using a Roland GP100 preamp, along with an Eventide H3000 and some other processors, but more recently he's been using the TC Electronic G-Force and a new TC unit. We used a TC preamp/processor while recording

better over the last few years. Even as recently as two years ago, digital effects processors were less successful and tended to need help, so we then either EQ'd them or added more processing to make them more successful. For us, panning is probably more critical during mixing than effects processing. Robert gives very careful consideration

miked up and the sounds were merged. We did it mostly to create air. Somehow a sound that moved air just felt better.

*Did you place the mics close to the cabinets or try to capture some of the room sound?*

We didn't record the sound of the room with an ambient mic, but the mics were a few feet away from the speakers. At Real World [where *Thrak* was recorded] we used Neumanns, though I usually use Shure SM57s.

*Do you use much processing in the mixing stage?*

No, not a great deal, particularly on more recent recordings. That's mostly because the processors have been getting

**A STEREO EFFECT CAN BE CREATED BY  
MIKING BOTH THE FRONT AND  
THE BACK OF THE SPEAKER CABINET, WITH  
THE PHASE REVERSED ON THE REAR MIC.**

**—DAVID SINGLETON**

Project Four, and the DI sounds were totally convincing.

Robert has a great interest in stereo placement, so even back when we were recording a single amp we attempted to create a stereo sound. A stereo effect can be created by miking both the front and the back of the speaker cabinet, with the phase reversed on the rear mic. The one in front naturally gives you a sense of where the guitar is, so if it's on the left and the other is on the right, the guitar will sound as if it's toward the left. It gives you a much more present and genuine sound. In fact, the phase confusion is actually helpful. Later, when King Crimson did *Thrak*, Robert's sounds were generated from his rack and DI'd, but then the stereo sound was sent to a pair of Vox AC30s, which were

to how the guitars are panned, and to a certain extent the panning comes first, before moving on to EQ and level. In the '80s King Crimson, Robert and Adrian Belew's interlocking guitars both had stereo signals, and they were typically panned one of two ways. Usually one would be panned hard left and about half-right [3 o'clock], and the other panned hard right and about half-left [9 o'clock]. They met in the stereo field, with each going beyond the center. Other times they were panned almost, but not entirely, hard left and right

*What about cabinet emulators?*

Robert uses the onboard emulators in the processors. In fact, when going back to some older tracks that were not printed all that well to tape, we used



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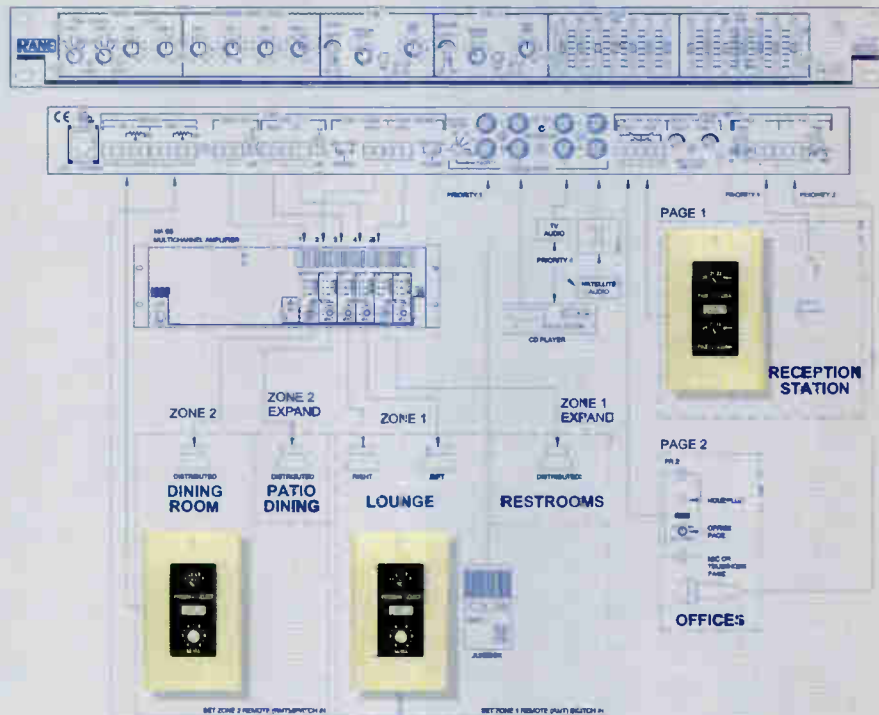
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just the cabinet emulations in the GP100 to improve the sound. A lot of the time what they're doing is really an EQ function, but we used them quite successfully when we were processing live recordings of King Crimson shows circa 1984, when both guitars were recorded fairly poorly.

*In the studio, do you record to analog or digital or both?*

Both. For King Crimson we usually record to 2-inch with Dolby SR; that's our favorite. I think that analog tape helps when you are using a lot of these digital guitar sounds.

*By overdriving it a little to get tape compression?*

That's right. The digital guitar sound recorded to an ADAT is much less satisfactory.

*Anything else?*

Things have actually become a bit boring for me using the DI approach, but these things tend to go in phases. For example, Adrian Belew is currently going in the opposite direction and using digital amps that allow you to preset lots of different sounds within the amp. So, there's sure to be more fun around the corner.

## KEVIN SHIRLEY

Kevin "Caveman" Shirley's many production and engineering credits include Aerosmith (*Nine Lives*), Journey (*Trial by Fire*), Dream Theatre (*Falling Into Infinity*), *Once in a Lifetime*, Silverchair (*Frogstomp*) and the Black Crowes (*By*

*Do you have a general philosophy for recording electric guitar?*

The source is the most important element in the guitar sound, so there has to be a good sound coming out of the amplifier. After that, the recording procedure for me is simply capturing that sound. Microphones these days are designed to capture sonics as accurately as possible, so all you need to do is put a mic up in front of the amp and the rest of it should be a piece of cake.

*Do you ever record guitar directly without an amplifier?*

No, I don't do any direct recording. Actually, it's not true that I haven't done any direct recording; when I did Journey's *Trial by Fire*, Neal [Schon] recorded all of his parts direct using a Marshall tube preamp. But Neal's got a different sound, a more processed sound.

*How about room mics?*

I like the sound coming directly out of the amplifier, and I like it to be as up-front as possible. Too much room sound can make a guitar sound sort of cloudy and less well-defined.

*Do you have any favorite mics?*

I always use a Shure SM57 and a Beyer M201 in a 90-degree position. The Beyer has more bottom end, and the 57 has a nice, crisp top. I just balance them up, making sure that the phase is perfect, then I give them a little compression, usually with an 1176. If I need to tweak the EQ at all I'll use a Drawmer 1961 tube equalizer.

*Do you print effects?*

**I LIKE THE SOUND COMING DIRECTLY OUT OF THE AMPLIFIER, AND I LIKE IT TO BE AS UP-FRONT AS POSSIBLE. TOO MUCH ROOM SOUND CAN MAKE A GUITAR SOUND SORT OF CLOUDY AND LESS WELL-DEFINED.**

**—KEVIN SHIRLEY**

*Your Side*). Shirley describes himself as "definitely old-school rock" when it comes to recording, preferring to have everyone play live at the same time. We reached him at Avatar Studios in New York, where he spends much of his time.

I think that if a guitarist is going to use effects they should go through the amp and be recorded as part of the sound. I don't print any additional effects that don't originate at the amplifier.

*Do you employ track doubling or any*



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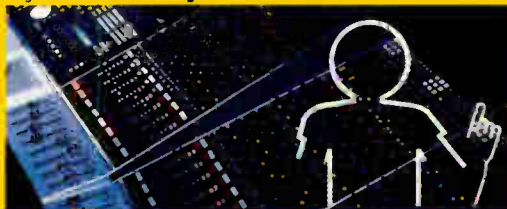
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other special tracking or mixing techniques?

It depends on the band. I really like that AC/DC style of tracking, where you have two distinctly different guitars on each side; I really love that. I'm mixing a Little Steven album and he pretty much doubled up everything exactly, which gives kind of a big, broad mono sound, which is very powerful. I really don't use a lot of tricks when I'm mixing.

*Are the guitar sounds on Dream Theatre's Falling Into Infinity mostly just coming from the amp?*

Well, John [Petrucci] is an incredible guitar player, and very few people can do what he does. I just mixed a Liquid Tension Experiment album, and John's playing is amazing. On *Falling Into Infinity* we used different techniques to get different sounds, but there were no studio effects really; all of the sounds originated at the amp. We'd just try to get different sounds at the source. You should have seen it when he was in there: We had about ten Mesa/Boogie amplifiers in combination, a whole wall of Boogies, and we just tried different amps all the time. We tried small ones, big ones; it was really a lot of fun.

*Do you prefer to track to analog or digital?*

Oh no, I can't stand digital, although I must say that some of the new 24-bit digital converters are sounding really good. I like to track to analog and get some of the tape compression. I find that it tightens up the bottom end and I like that.

*Do you print pretty hot?*

Pretty hot, yeah. When you stand in front of a Marshall amp when it's cranking you get that low end that makes your gut want to drop out the bottom of your pants. The only way to really capture that is to tighten up the bass, and I find that tape saturation does that really well.

*Is there anything else that you'd like to add?*

No. I think that engineering is one of the most overrated professions of all time. I mean, given the fact that microphones are developed so incredibly to capture nuances in sound, all you need to do is stick them up and record. I know that's not very technical. ■

*Barry Cleveland is the editor of the Mix Master Directory and the Recording Industry Sourcebook, in addition to engineering, producing and playing guitar in the improvisational quintet Cloud Chamber.*

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# BLONDIE: STILL DREAMING

**DEBORAH HARRY, CHRIS STEIN AND PRODUCER/ENGINEER CRAIG LEON TALK ABOUT THAT RARE REUNION THAT WORKED**

Seventeen years between albums is an eternity in the pop music world, yet half a minute into the first track on Blondie's greatly anticipated reunion album, *No Exit*, it feels as if the group never left. The hard ska beat, the aggressive guitar, the wheedling, semi-cheesy keyboard and the distinctively smooth vocal of Deborah Harry announce that the band are intent on picking up where they left off. The famously eclectic group still refuses to be pigeonholed: *No Exit* contains invigorating slices of driving pop ("Maria," "Nothing Is Real but the Girl," "Under the Gun"); the Bach-meets-metal hip hop-inspired title track (featuring rapper Coolio); a slick but still trashy girl-group cover (the Shangri-Las' "Out in the Streets"); dreamy ballads ("Double Take," "Night Wind Sent"); a cajun-style waltz, complete with sawing fiddle ("The Dream's Lost on Me"); a smoky hep-cat jazz tune ("Boom



L to R: Jimmy Destri, Deborah Harry, Chris Stein and Clem Burke

PHOTO: ©RETNAMICK/HUTSON



Craig Leon at Abbey Road Studios, London Penthouse, November 1998

Boom in the Zoom Zoom Room"); and, to end the album, a mesmerizing bit of aural voodoo that sounds like it might have been written by

Dr. John ("Dig Up the Conjo"). All in all, it's quite a pastiche of styles, but still unmistakably Blondie.

"Blondie is the epitome of what a pop group is supposed to be," comments Craig Leon, who recorded and produced *No Exit* some 20 years after he helped produce their debut, which remains one of the great works of the early new wave period. "They do what they want, and it still sounds like them. They never stood still long enough to be boxed into one style."

The Blondie reunion includes four members from the old days—Harry, guitarist Chris Stein,

keyboardist Jimmy Destri and the incomparable drummer Clem Burke. A host of other musicians—most notably bassist Leigh Fox and guitarist Paul Carbonara—fill out the sound on the album. The songwriting duties were shared by the group members and a few outsiders, such as Romy Ashby and former Go Go Kathy Valentine. So far, the album and promotional tour have been received warmly, especially in England, where Blondie has always had a huge and rabid following. In fact, the first single there, "Maria," entered the UK charts at Number One. Three live cuts recorded on their fall '98 UK tour appear as powerhouse bonus tracks on *No Exit*: "Dreaming," "Call Me" and "Rapture." The album was cut at Stein's home studio, at Electric Lady and at Chung King, all in Manhattan, with Leon engineering. Leon mixed eight tracks at Abbey

BY BLAIR JACKSON



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Road in London (where he has lived since 1986); the remaining six were mixed at Encore Studios in L.A. by Mike Shipley. The live tracks were recorded by James Birtwistle in the BBC Live Music Mobile and mixed by Randy Nicklaus.

In early March, I talked to Debbie Harry, Chris Stein and Craig Leon about the making of *No Exit*, about Blondie's earlier work with Platinum producer Mike Chapman, and about what the future may hold for this still-creative and endearing band.

*How did you book up with Craig Leon again? Twenty-two years has to be one of the longest gaps between records for a band and producer.*

Debbie Harry: When we were tossing around ideas and his name came up, it just seemed natural. Here was a guy who worked well with us in the past, and since then he's done a lot of interesting, chancy stuff. So we figured, if we're having a reunion, we might as well have a *real* reunion.

Chris Stein: He's really diverse, and that's part of what we liked about him.

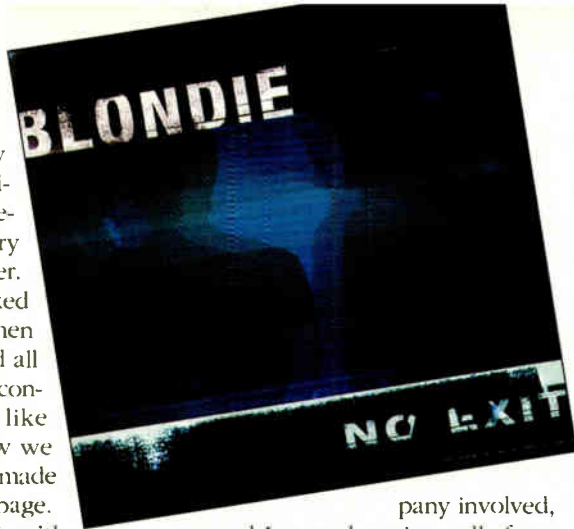
He's done classical and rock and folk and Prodigy and all this other stuff. He's very open-minded and into experimentation, like we are. He's really a very far-out guy, very futuristic and a modern thinker.

Jimmy and Clem had worked with him in the interim, and then when I talked to him, he said all the right stuff. We had a long conversation, and it seemed like everything he said about how we should approach the project made sense; we were on the same page.

Craig Leon: I'd worked with Clem on a couple of projects in England, including some successful pop records—with Mark Owens and a solo album by Steve Hogarth from Marillion. But I've stayed in touch a bit with all of them through the years, and every once in a while various members of the band would say, "You know, one of these days we're going to go back in and do it like it was in the old days, when Chris had a loft in the Bowery and we'd work up a few songs and go in and cut 'em." This has been going on for years—I'd hear it maybe once or twice a year. But this time there was a management com-

pany involved, and I started getting calls from everyone saying it was happening.

Originally there was a different vision for it. I believe it was going to be a greatest hits package plus a few new tracks. Mike Chapman was going to do a track or two, and I'd do a track or two and even somebody else might do a track or two, covering the spectrum of the different sounds of the band, and something radically different. Then that kind of fell by the wayside so we figured we'd start working on something to see what we could get, to see if we could come up with any tracks at all. And it just evolved over time into sort-



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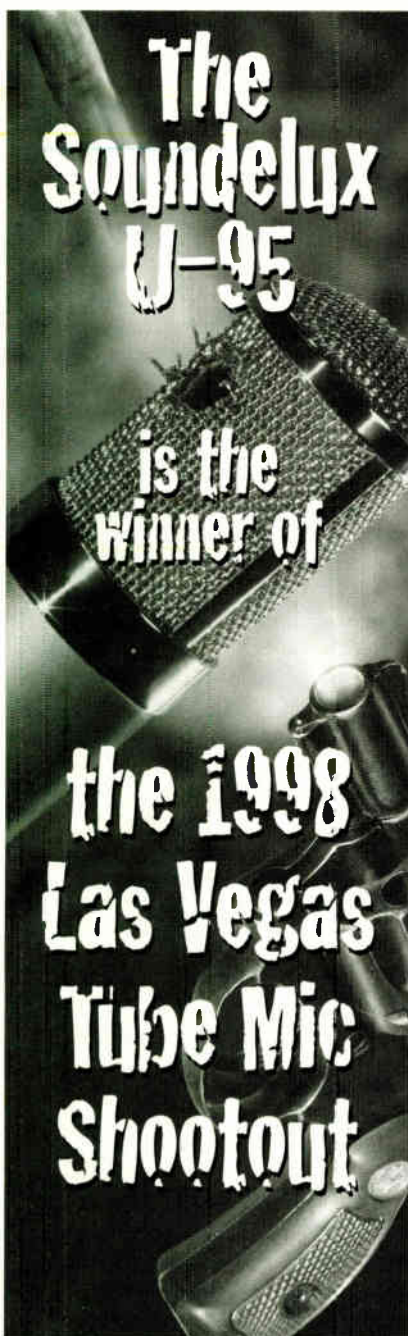
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ing through a lot of tracks and turning it into an album.

*Did you have a vision of the production going into the record? It's more stripped-down than a lot of the later Blondie records.*

Harry: That's definitely a big difference. We worked it up bit by bit and made decisions as we went, but I, for one, had done three solo records that weren't as thick, and I think it was a natural way for us to go.

Stein: Another thing Craig brought to the record that I really liked was a certain minimalism. The old stuff is very dense, wall-of-sound with layered guitars and lots of doubling and all that, and by comparison this is a very minimal record; the most like our first album in terms of the technique. I guess there are a couple of doubled vocals, but not much, and I don't think there are any doubled guitars at all this time.

*What is Red Night Recording, where some of the album was cut?*

Stein: That's my basement studio. I have an old MCI console, and we brought in an 02R and the Otari RADAR and some older outboard mic pre's, nothing too extensive. We demo'd the whole record with drums here, with just a few microphones, and did basic tracks. We'd do these basics where we'd have the song finished in a day or two. We also did overdubs and everything here in the house on a demo version.

Harry: With the RADAR we got to demo the whole album and get a sense of the flow of the record. We got to listen to basically a scratch version of the whole thing, and then we redid it.

Stein: We went to Electric Lady and redid the basic tracks with bass, guitar, drums in their rooms, which have such a nice sound. In some cases, we redid the other instruments, in some cases not. Then we came back here to my studio and did a lot of overdubbing and refining. Then, toward the very end we went over to Chung King and did some work there.

Leon: Basically, I showed up with my own equipment that I've been using here in Britain. Blondie is the ultimate band that works in sound bites and very short loops. Even when they were doing things analog back in the old days, they were doing things in loops, but live. So now we have a really good piece of digital equipment that I use a lot, the Otari RADAR, which became my master recorder on it. And that enables you to do sequences of human

live base material, so I thought it would be ideal for them.

Harry: I think we did it smartly. Chris' studio is not the most comfortable place, but we certainly had a more relaxed atmosphere and the clock wasn't running, so to speak. It was a place we were used to; we've all done things there over the years. And with someone like Craig doing it all digitally, it was a really good way for us to work everything up quickly and to know which way were going with it, and, frankly, to save some money. This was the first record we'd done digitally.

*What were the original demos like?*

Harry: Most of them were just music. To me, demos are usually just musical ideas; brief outlines, sketches. I know that these days record labels like to hear a close-to-finished piece before they even consider using a song, but we've never worked that way. We're sort of old-fashioned in that we really like to go in and develop things as a group, taking our time. Someone like Chris might come in with a really firm idea on a melody line or chord changes and a feel and bass lines and so on. But then when we actually get to doing them, they evolve with the input of everyone. Or sometimes they don't evolve; it depends.

Leon: The way Blondie works is the lyrics and vocal lines come last, so everything is done pretty much in terms of tracks first. When I came to New York in February of last year, some of the songs were in really great shape and some of them weren't. Some of them evolved from being little sketches into being something else. They weren't demo'd in any organized fashion. I'd heard various tapes of all different kinds of ideas, but I think there was only one song, "Under the Gun," which is one they'd tried with Mike Chapman years ago—that was pretty together. But even that mutated into something totally different. They had an incredible amount of musical ideas, particularly Chris and Jimmy.

What would happen is they'd start with keyboards and a guide click. We actually rehearsed the band in Chris' basement, and I recorded that live to the RADAR and we found all the tempos and all the arrangements. We worked up the songs live, and I chopped them around a lot in the RADAR to get the structures right. You might have a 22-minute jam, and then we'd turn the best bits of that into something. Rather than doing it with analog takes in the studio and cutting it



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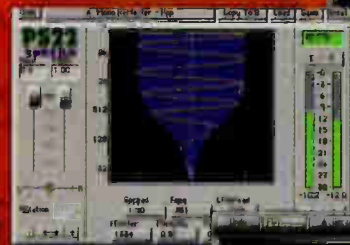
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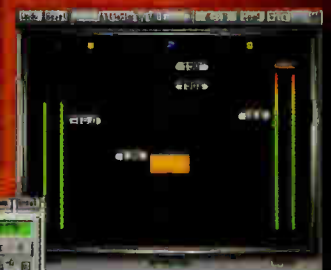
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together, we arranged it all first and then went down to Electric Lady and cut the final arrangements to the click tracks we'd done at Chris' studio.

So at Electric Lady we did the bass and drums to the guide keyboard and click, loaded all that back into the RADAR, chose the best takes from Electric Lady, and then I'd put together what could loosely be called Take One and Take Two from about 20 takes. And then Take One or Two would be what we put in the RADAR as *the* version. We'd get the basic track we really

liked edited all together in the digital domain, and then to get the sound of tape compression, which you can't get any other way, I'd send it over to a Studer [multitrack]. Then we transferred it back to the RADAR later to work on overdubs.

Stein: The RADAR is capable of putting very inspired performances down because if something is a little out time-wise, you can fix it. Plus you can do all the cut-and-paste, so if you get a really great guitar part, you don't have to play it a hundred times; you can move it around and have the same part for every verse if that's what you want.

*Is there a sense when you're working up material that a certain kind of song or sound is "Blondie"?*

Harry: When you get us together in a room, we sort of become Blondie, if you know what I mean. So that wasn't really an issue. But we wanted it to be eclectic and a little strange. We tried to have a lot of variety.

Stein: I just always hear Debbie in my head, and then I hear Clem's style; that's pretty much how that works. Jimmy would probably tell you the same thing.

*I always thought Clem was the great underrated drummer of the new wave era.*

Stein: He's a spectacular performer. He has a tendency to get emotional about his playing and will speed up at the high point of the song, which sometimes drives the bass player crazy, but it doesn't bother me much.

Leon: Clem Burke is one of the best drummers ever. They're all better players now, of course. And actually the one who's grown the most is Debbie. She's had the experience of working with the Jazz Passengers and various other outside projects, and she's seriously pro. She was always there giving her opinions. But her specialty is taking a vibey track and then coming up with an incredible vocal line on top of it. Sometimes she'd iron that out with Chris, sometimes with Jimmy. It depends on who wrote the basic core of the song.

*Did you mike Clem's drums any differently than you had 20 years ago?*

Leon: It's almost identical. Clem likes to go for the classic British sound.

*Well, he was the new wave's answer to Keith Moon.*

Leon: He was! So we miked him the way we would usually do here at Abbey Road. And we used the standard Electric Lady big drum sound, which I guess goes back to Eddie Kramer. And that is basically a lot of room: two 87s at about floor level; a 47 on the kick, believe it or not—that's an old British technique—and then a Beyer 88 on the snare and a 451 on the bottom; and 421s around the toms and a C24 overhead.

*The first couple of Blondie records had this sort of live punk aesthetic, and then Mike Chapman came in...*

Stein: Right. The first two records were made the way most people make records, which is you go in and you play like a band and you do a few overdubs and that's it. Then, when we got to Chapman, it was like school's out; we really spent a lot of time on the records we made with him.

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*How did that relationship come about?*

Stein: He came around to see us at the Whisky [in L.A.], and he liked us a lot and he seemed to "get" what we were doing. Phil Spector came to see us and wanted to produce us. That was in one of his manic periods. We went to his house one night, and he was waving a .45 around. Anyway, that relationship never went anywhere.

*I remember when I was writing for BAM in the late '70s we had Chapman on the cover dressed as General Patton, at his insistence.*

Harry: Exactly! He knew himself. He had a good sense of humor about himself.

Stein: Yep, that was him all right. He was amazing, though. At one point he had something like three different Number One hits three weeks in a row, with us and "Hot Child in the City" [Nick Gilder] and something else. He had something like 40 Number One records; it's insane!

*So his autocratic style didn't bother you?*

Stein: No, because he never tried to write for us. He just tried to pull the best performances out of us. For me, he was a total influence in production and just general musicianship and learning about being patient and the value of repetition. Because in any artform, you have to repeat yourself, and it's always a challenge to do something a hundred times and to make the hundredth time as fresh as the first.

Harry: He was pretty much of a dictator, but he had all this credibility as the popmeister—the tunemeister—and we learned a lot from him working on those records. Even though they were considered very "pop" by some people, they were still pretty adventurous.

*Obviously it was a good enough relationship that you kept it going for several records.*

Harry: Oh yeah, he's a really charming guy. Even though he worked us pretty hard, we still had a lot of fun. He was always cracking jokes, and every once in a while he'd whip out a bottle of tequila or something for us. He knew

how to make records, and he liked working with bands. He's the kind of producer who worked well with bands.

*You guys did a one-off with Giorgio Moroder for "Call Me."*

Stein: Moroder was like the exact opposite of Chapman. He didn't want to do hard work at all. A lot of what's on that record are parts that he replaced. They're parts that we played and then he just replaced them with his guys rather than having us bother refining them.

Harry: He had done a lot of nice things. The soundtrack for *Midnight Ex-*

dance clubs. It sounded like us, and it had a more aggressive feeling and more guitar action in it. Looking back, it seems silly that anyone was shocked by it, but they were.

Stein: Those dance songs were so much more difficult to make than regular rock 'n' roll! If you did a song like "Heart of Glass" today, with MIDI, if you could come up with the parts, you could put that together in a few hours. But at the time we made it, it took us something like two weeks. It was all manual, all played around one little synthesizer pulse track and a rhythm machine part. The bass drum took like three hours—Chapman insisted that every single beat had to be exactly right. The guitar part was done with tape delay and it took hours and hours, making sure the pulse of that was perfect.

Harry: You can't imagine how hard it was to do that mechanical feel and be so precise, manually. It really was a labor-intensive record. That's the way Mike worked; actually it's the way most people worked in those days. He was a real precise person, and he liked every-

thing to sound very clean. We worked really hard for him, and I think it paid off.

Leon: He brought them into the realm of competitive commercial disco, and things like that, and that wasn't my forte at the time, to say the least. I've since grown to really like dance music and have done a lot of things in it, from Jesus Jones to hardcore techno stuff like Super 2.

*When you work with a producer, be it Chapman or Leon, do you tend to be very vocal about your own ideas?*

Stein: I'm not afraid to speak my mind. But I'm also open to other people's ideas. You have to be to be in a band. That's what a band is if it's working right. Craig and I were very close on this project [*No Exit*].

Harry: It depends on the project; it depends on the song. On some things I know exactly what it should be, and on other things I listen to other people's ideas and judgments more. With the earlier Blondie records, I really didn't



PHOTO: NINJA VADUKUL

L to R: Chris Stein, Clem Burke, Deborah Harry and Jimmy Destri

press, and I loved the Donna Summer track he did; that was beautiful. He was a totally different kind of producer than Mike Chapman. He was really in control of what came out on the final record. We would go in and each of us would play parts that we liked, and then he would have them completely redone, incorporating some of those ideas. It was more like the producer-as-creator, which is not the way we were used to working. He's not really a "band" producer.

*Blondie was one of the first new wave bands to cross over into dance music, and I recall it being quite controversial at the time because there was a real breach between the two camps.*

Harry: That's right. We took some shit for it. A lot of our contemporaries were very put off by that and shocked and so on, but I didn't really see the difference in a way. It was *our* take on that thing, and it certainly didn't sound like everything else that was coming out in the



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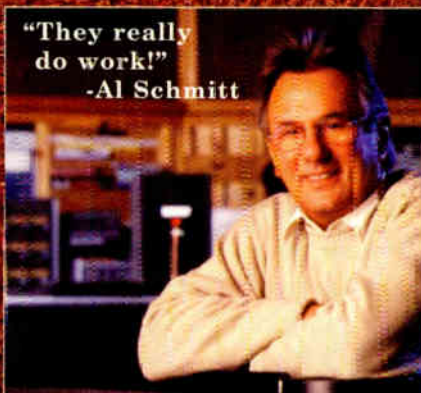


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want to be involved in production decisions. At this point, with the more minimal approach, I find it more to my own sensibilities and I tend to have clearer ideas about what I'm after.

*You worked with Nile Rodgers and Bernard Edwards on Koo-Koo, Debbie's first solo album. What can you say about their production style?*

Stein: They weren't as rigid as Chapman. They tried to be, but they didn't quite get there. Later, I tried to remix one of those tracks, and I was amazed at how much Tony Thompson's rate of speed changed even though I thought it was so solid at the time. I couldn't sync it up with anything.

Harry: Oh God, that was hysterical! They were very funny. It was a good collaboration. It came out about six months before "Ebony and Ivory," and at that time I don't think Chrystalis really wanted me to break off from Blondie; they really wanted Blondie to continue, so they really didn't push it very much, and they didn't make much of the fact that it was a collaboration between black artists and white artists, which at that time wasn't done very much. The fact that it was Chic and Blondie I think was kind of brilliant. I'm very proud of that record.

*On the new album, is a song like "Dig Up the Conjo" pretty much the way it was conceived, or did it evolve as it was recorded?*

Stein: That evolved. Jimmy had something he did on the Kurzweil as the basic track, and then we threw the guitars on it. You know what it is? It's like the groove for that Beatles song, "Tomorrow Never Knows" [off *Revolver*]. That's what we were thinking of. Then the vocal melody changed it a bit, gave it that Eastern feeling.

*I really like the layered vocals. Were those parts preconceived or did they appear as the song developed?*

Harry: It started with just the lead vocal, and then I wanted to try something unusual to make it sound more eerie. So that's what the harmonies do. In spite of its dark side, there is a certain levity about that song.

Leon: I like that song a lot. It's sort of psychedelic. Clem wanted to do something with a British psychedelic feel, so that's what that turned into a bit. Jimmy had the original concept for it, but Clem came in with the groove.

*Was "The Dream's Lost on Me" conceived as a cajun country tune?*

—CONTINUED ON PAGE 227





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## UK TECHNOLOGY IN THE U.S. LIVE SOUND MARKET

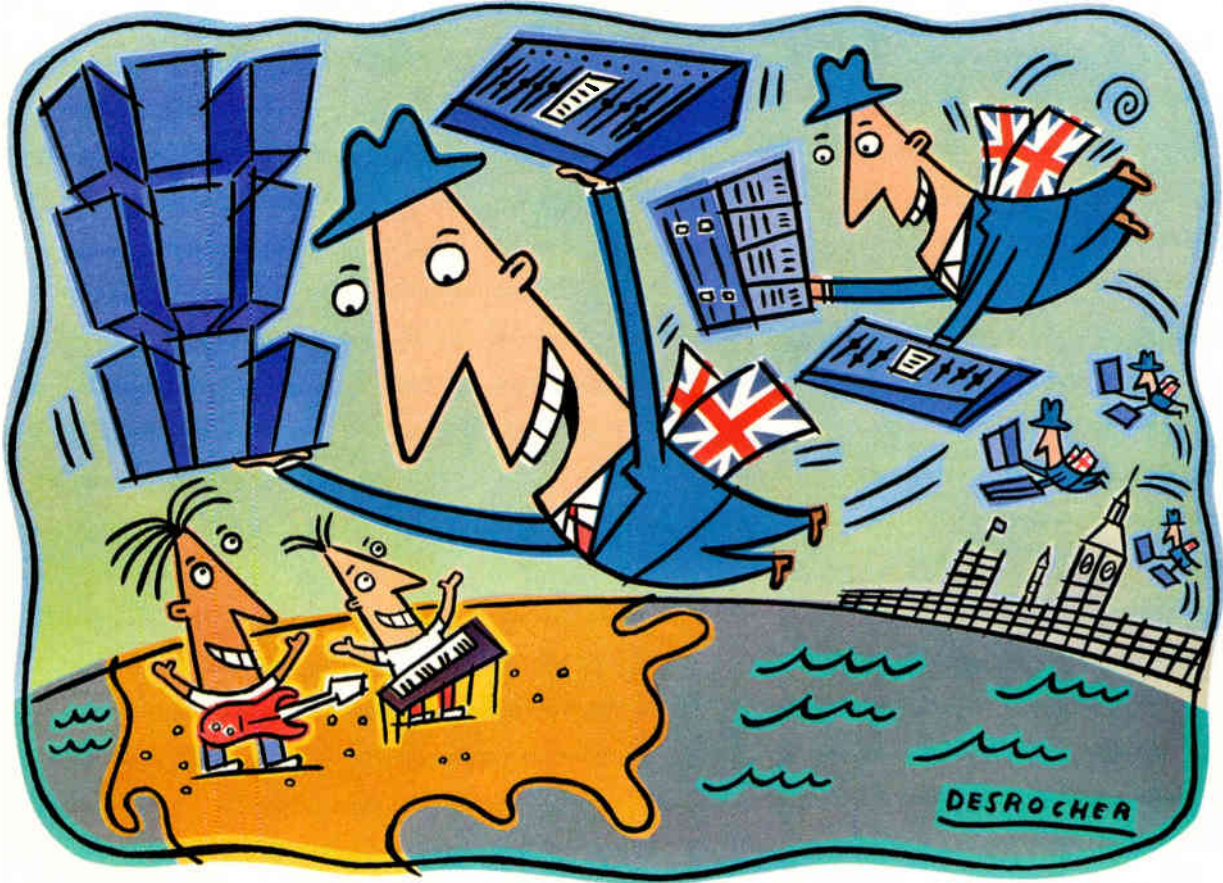


ILLUSTRATION: JACK DESROCHER

When The Beatles played their last concert, at San Francisco's Candlestick Park in 1966, the equipment list for the show could have been written on the back of an envelope. The mics were Shure SM56s, the speakers were modified Altec A-7s powered by Altec 1569 80-watt tube amplifiers, and McCune Sound's Mort Feld mixed the show on one or two Altec 1567 five-input rotary pot tube mixers. By modern standards, the sound system was a bare-bones setup—no monitors, no graphic EQs, no delay lines, no dynamics processors and no effects. More noteworthy, from a modern perspective, is the fact that the sound system did not include any equipment made by a UK-based manufacturer, unless you count the Vox guitar amps onstage.

Today, British-made audio gear is ubiquitous, and there are few, if any, concert sound systems that do not include components from the UK. The inventories of most U.S. rental companies contain signal processors from British-based companies such as BSS, Drawmer, Klark Teknik and XTA. Dozens of top live sound engineers regularly specify Amek, Midas or Soundcraft consoles. And Martin Audio and Turbosound are names that feature in any serious discussion of the relative merits of loudspeaker systems.

The list goes on. Cadac mixers have been a fixture on Broadway since they were first specified by *Starlight Express* sound designer Martin Levan in the early '80s, and a Cadac M-Type monitor console is

currently touring the world with the Rolling Stones. Allen & Heath mixers and Tannoy loudspeakers commonly appear in contractors' bids throughout the wide-ranging fixed installation market. And new British companies spring up each year, eager to win a slice of the largest and most competitive live sound market in the world. This article will attempt to trace some of the events and personalities that changed the status of British pro audio manufacturers in the U.S. live sound market—from no-shows to serious contenders.

### WHO CAME FIRST?

It is now rather difficult to define which British audio manufacturer first became successful in the U.S., but Soundcraft could well be the

—CONTINUED ON PAGE 110

BY CHRIS MICHIE



# COLIN FAIRLEY AND HELIOCENTRIC STUDIOS

## *Producer/Engineer's New Home Is a Project Room That's Gone Commercial*

When *Mix* first got word that Chris Difford (with Glen Tilbrook, chief songwriter and singer in Squeeze) and Elvis Costello had set up a studio, called Helioscentric, in the English countryside, that sounded pretty interesting. And that was before we found out that the studio is managed by the fine producer/engineer Colin Fairley.

Fairley is an alumnus of '70s-era Air Studios who went freelance in the early '80s. He's mainly known for his work with some of that decade's coolest pop artists, including the Fabulous Thunderbirds, Nick Lowe, Elvis Costello, Echo & The Bunnymen and General Public; these projects began coming his way through the connections of his then-manager, the infamous Jake Riviera. Subsequently, Fairley has worked on numerous international recordings, and for a time he managed The Power Plant and Maison Rouge studios.

For the past year, Fairley has managed Helioscentric, a commercial facility that was first conceived as Difford's writing studio. With a brand-new (not just rebuilt) Helios console and repeat clients such as the Pet Shop Boys and Paul Weller, the studio seems to be one of England's more exciting new music rooms, and Fairley's extensive experience with all kinds of studio work is a huge asset. We got the chance to speak with Fairley in March about his career, and his new job.



Above: Colin Fairley at the new, hand-built Helios console; below: view of the rear of the control room.



*How did you first get into professional audio?*

I began my career as a professional drummer with several bands in the late '60s and '70s, touring the world and making

records. In the end, I started to enjoy the recording process more than the live side of being in a band. My whole outlook changed when we were making an album with producer Andy Johns. We had recorded two takes of this particular song, and Andy preferred the first one, and I said to him, "That's a pity because the drum fill going into the solo section is much more happening on the other take, Andy." To which he replied, "That's okay. I think we can do something about that. Why don't you all go down the pub for half an hour and leave me to it," which we did begrudgingly—not! When we came back and listened to the song, to my astonishment, there was my happening drum fill in the take that Andy preferred. Of course, he had edited the multitrack. I could not get my head around how he had achieved this, not

knowing anything about the recording process. I just thought this was sheer magic! From that moment on, I was hooked. I became a real pain,

BY BARBARA SCHULTZ

—CONTINUED ON PAGE 104

## ROCKFIELD STUDIOS

*More Than History*

To call Rockfield Studios (Monmouth, Gwent, Wales) historic might be accurate, but it doesn't tell the whole story. This legendary facility is said to have been the world's first-ever residential studio when it opened for business in 1965. And it has certainly hosted sessions for some of the rock 'n' roll era's most popular artists. In addition to the studio's first hit recording, Dave Edmunds' version of "I Hear You Knocking," Rockfield has been used over the years by Rush, Queen, Iggy Pop, Robert Plant, The Pogues, Paul Weller, Simple Minds, The Damned, Echo & The Bunnymen, The Waterboys, XTC, etc., etc.

However, like other truly venerable facilities such as Abbey Road and Olympic, Rockfield has continued to evolve and to attract cutting-edge artists. For example, during a 12-month period from '96 to '97, Rockfield sessions resulted in five UK Number One albums, by Oasis, Ash, Black Grape, The Charlatans and the Boo Radleys.

Rockfield is still owned by one of the original founders, Kingsley Ward, who started the studio with his brother, Charles, as a place to record their own group. Now the studio is run by Kingsley Ward and his daughter Lisa, who handles all bookings. Though it has, obviously, grown since its earliest days, the studio still resides in its original location. "Rockfield was developed by converting redundant farm buildings without the help of any design consultants," Kingsley Ward recalls. "We have always relied on our own ability for acoustics. To this day, Rockfield relies on natural acoustics to capture the sound of musicians."

The facility consists of two main studios, The Quadrangle and The Coach House. Each offers a very large main live room (28x19 and 26x14 feet, respectively); an additional good-sized live iso room (The Quadrangle incorporates two iso booths); and four natural echo chambers with an



Above: the Quadrangle Studio control room; below: the Quadrangle main studio.



up to 3.2-second reverb time.

And, of course, over the years, the facility has amassed a tremendous selection of equipment. Each control room is equipped with a 60-input Neve VR console and JBL 4350 main monitors. Both studios offer a variety of Studer A820 24-track, 2-track and 2-inch recorders with Dolby SR. There's also an extensive list of outboard gear from AMS, Klark Teknik, Yamaha, TC Electronic, Tube-Tech, Drawmer, Orban, Eventide and others. And the studio is particularly proud of its vintage Neumann microphones, which include two U67s, five SM2 stereo mics and two KM56s. There are also many newer choices from Neumann, AKG, Sennheiser, EV, Shure and Beyerdynamic. A three-person maintenance crew works full-time during weekdays and is on call in off hours to keep all the gear in shape.

Each studio at Rockfield also offers its own accommodations. The Coach House includes a seven-bedroom house with all modern conveniences, including satellite TV and whirlpool bathtubs. The

Quadrangle includes three self-contained apartments, as well as half a dozen more rooms with bath. Among their key personnel, the facility owners list their head chef, Jim Woods, whose staff can provide three meals a day for hungry artists.

The Wards have also extended themselves into publishing and artist promotion, and Kingsley Ward says he now spends a good deal of time in the States promoting those interests. He also says that he's "contemplating a retrofit within the next few years."

So, Rockfield continues to attract the big names and to break records, decade by decade. "More than 1,000 million recordings from Rockfield have been sold worldwide," Kingsley Ward says, "which is more than all the other residential studios in the UK put together."

For more about Rockfield Studios, visit [www.demon.co.uk/studiobase/rockfield](http://www.demon.co.uk/studiobase/rockfield).

BY BARBARA SCHULTZ





# Study music and production in Europe Study music and technology in Europe

HKU (Utrecht School of the Arts) is one of the largest schools of Fine Arts in Europe. Its faculty of Art, Media & Technology specializes in the areas of Music Technology, Audio Design, Audio Visuals, Animation, Image Technology, Interaction Design and Digital Media Design. Its student body consists of 700 students in both the B.A.- and M.A.-programs. The School also hosts M.Sc., M.Phil. and Ph.D. programs in Music Production and Music Technology.

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Europe offers diverse educational and artistic opportunities and interesting travel opportunities. The M.A.-programs were developed in co-operation with seven other leading European Art & Technology Institutes in Barcelona, Helsinki, London, Mallorca, Paris, Portsmouth and Stuttgart.

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The Dutch have a history of innovative educational thought and flexible curriculum. The programs are taught completely in English and the majority of the population speaks English.

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The faculty, facilities and student body at HKU has established an outstanding reputation for high quality work and placement within the art & technology community.

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**Utrecht School of the Arts**

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## INTERNATIONAL UPDATE

—FROM PAGE 101, COLIN FAIRLEY

asking him questions at every given moment.

We did some more recording after that with the great Shel Talmy. He was totally inspiring. He had the great gift of bringing the best out of a musician without you even knowing it. I don't mind admitting I have tried to model myself on Shel for years. After working with Shel, I decided this was the career I wanted, to be a record producer.

The inspired advice he gave me when I approached him to fulfill this newfound ambition was to learn about the technology first, i.e., become an engineer. This was around about 1974, when studios started to use 24-track and the first Neve computer system was developed, Necam. I also called Ken Scott and Andy Johns, who both gave me the same advice. So now it was down to finding a job in a studio.

### *Where did you end up working?*

The A&R guy at Charisma Records, the label I was signed to, knew the bookings coordinator Patti Nolder at the world-famous Air Studios, gave her a call and within an hour I had an inter-



*Helioscentric is built into an old shed on Chris Difford's property.*

view. Some guy had not turned up, and I got his slot.

I planned to stay at Air for about three years but ended up being there for eight. It was the luckiest break of my life. The famous Sir George Martin, Geoff Emerick, Bill Price, John Punter...the list of talent is endless. It is a known fact that 90 percent of engineers who were trained at Air during that period have gone on to be highly acclaimed engineers and producers. A fantastic learning experience.

### *What did you work on while you were at Air?*

Geoff Emerick was the guru of engineers at Air, and I was lucky enough to become his assistant for 18 months, working with such diverse artists as Gino Vanelli, Robin Trower, Gallagher and Lyle, Split Enz and many more.

### *When did you go from being Emerick's assistant to a first engineer?*

I became a fully fledged engineer not long after that, cutting my teeth on sophisticated jingles and the like, record-

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ing orchestras, brass, everything you can imagine. There were no samples at that time to speak of. It was an excellent way to learn, to achieve the best sound you can possibly get in a very short time. You had to record, overdub and mix, all done in three hours, less sometimes.

Like all house engineers in good studios, you start to develop a reputation and build up relationships with artists and producers. I did a lot of work with producer John Punter, working with artists such as John Mellencamp—Johnny Cougar back then—Judy Tzuke, Japan, Sad Cafe, etc. Also, hit producers Clive Langer and Alan Winstanley, who were producing Number One records with Madness, Teardrop Explodes, Dexy's Midnight Runners, etc.

*And then you went freelance.*

Yes. In 1981 or 82, I was approached by Jake Riviera—a legend in his time—for management, which I gratefully accepted, and I entered the daunting world of the freelance engineer. Within a week of being freelance, I was asked if I would like to go to Austin, Texas, to work on an album with Nick Lowe, who was

producing the Fabulous Thunderbirds. Nick and I hit it off straight away and became good friends. That album was one of the best and most enlightening experiences of my recording career so far. *T-Bird Rhythm* is still one of my favorite albums. Here was a no-nonsense, shit-kicking band. It was "1,2,3, go!" and if you were not in Record, you had missed it. It's an extremely raw-sounding record, all done live except for the odd backing vocal. Tough as old boots.

I gained quite a bit of credibility from *T-Bird Rhythm* and continued to work with Nick on his own albums. We worked on three altogether. I think Nick is one of the most underrated songwriters of his ilk. Another great chap and a very funny man.

*Did you meet Elvis Costello through him?*

Yes. Nick and I did the *Blood and Chocolate* album together, another unique experience. Nick called and informed me that Elvis wanted to record the album with a P.A. in the studio because it felt and sounded so good in rehearsals. I thought, this is a long way from the Air school of recording, but damned exciting!

So there we were in the famous

Olympic Studio One with the original hand-built Dick Swettenham Helios console and 3M M79 multitrack. It's one of the greatest-sounding rooms in the world, totally natural-sounding with a short decay time. We set up the band as they would appear in the final stereo image: drums center at the back of the room, bass center at front, keyboards to the left and Elvis' guitar to the right. Each member had two P.A. monitors in front of him, and Pete Thomas, the drummer, had one large drum monitor either side of his kit.

I thought we would have tremendous phase cancellation problems, but we didn't. Everything had so much air around it. It was wonderful. Everything was miked up as per normal, but because of all the spill leaking through the monitors, I ended up using very few mics. I can't say this technique worked for every song, but the tracks that had the space in the arrangement worked like a dream.

The best example is the song "I Want You." The vocal performance sent shivers down my spine. The mix used on the album is the original monitor mix 30 minutes after we cut the track, warts and all. Pure magic. This to me



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was what recording was all about—the moment! I am convinced this performance from the whole band was achieved because of this unusual studio setup. Elvis is an innovator. Every day in the studio with him is a unique experience, as with all great artists. He never stops working at his craft, and you have to keep up with his pace, which can be daunting, but so creative.

The *Blood and Chocolate* album generated more work for me personally than any other project I have worked on. It was highly acclaimed by the critics and people throughout the business, and I became known as a guy who could capture on tape the true sound of a band. I started to produce and engineer a lot of young, inexperienced bands, some of which I had success with such as The Bluebells, General Public and Echo & The Bunnymen.

*Then we didn't hear from you for a while.*

In the late '80s, early '90s, computer-based music became the fashion. It left me cold, I'm afraid. I just couldn't feel it. A producer friend of mine, Robin Millar, called and asked if I would be interested in managing his studios for him, namely Power Plant and Maison Rouge Studios, which I did for three years with a combined staff of 28 people. Unfortunately, they went into liquidation, due to a combination of lack of proper finance and extremely high interest rates. This was also true of several other established studios in London.

I then received several offers to produce artists from other countries, mostly Spain and Japan. I spent most of '97 remixing and remastering three Rory Gallagher albums after his untimely death, searching through hundreds of old multitracks for unreleased "gems."

In '98 I became the manager of Helioscentric Studios, which is now my passion. Here I have recorded a solo drum project called Drumbaba with Gilson Lavis, Jools Holland's drummer; a Spanish artist called Jaime Anglada signed to Virgin Spain; and I'm working on a solo project with Chris Difford. The studio is now busy with outside clients, with artists like Paul Weller becoming regulars.

*And now you're also back working with Costello, on the studio. What is his involvement in the facility? Is he just an investor?*

No, it is not just a financial thing. He has been extremely busy with the Bacharach collaboration, but he plans

to record here in the near future with the Brodsky Quartet and Steve Naive.

*Did either owner take part in the design or equipment purchase decisions?*

Chris Difford had a lot to do with the interior design of the studio.

*Tell me about the new console. I didn't know anyone was building new Helios desks.*

We have a totally new 32-channel Helios console with separate 48-track monitoring designed and built by Courthouse Facilities and Cyril Jones, formerly of Raindirk Audio, with Dick Swettenham as a consultant. He's the original Helios inventor. It's got all discrete electronics made to military spec, with the original 3-band EQ.

The console came about when Chris [Difford] wanted to have a home studio and he had the chance to purchase the original Helios modules from the old Island Studio desk, plus some more modules from a 12-channel Helios desk specially built for Alvin Lee. The two were put together to make one desk, but the engineer who installed it had got the power supplies all wrong and cut some very important corners. I was asked to come down and try the desk out and found all sorts of distortion and mismatches going on and, because I am not a very technical engineer, I suggested they call in an expert, namely Tony Arnold of Courthouse Facilities who deals in restoring Ampex tape machines and vintage desks. He corrected the mismatches and got it all working to a point but suggested we start again, installing oxygen-free cable and the like

to cut down the noise, etc. Then we started to have problems with all of the old modules, and it came to a point where the desk was unreliable.

Tony suggested, "If you like the sound of the Helios module so much, I can build you a desk using Dick Swettenham's original drawings." That is precisely what we did, along with Cyril Jones of Raindirk Audio.

I love the sound. It is warm, punchy and extremely defined, very natural-sounding. I like to use as little EQ as possible when recording. I tend to change the mic to suit the sound, not the other way round. Musicians come into the control room and tell me it sounds exactly like it does in the room, which to me is a compliment. It is old-school, yes, but all the current bands' musical references in this country are from the old school. An acoustic guitar sounds like a Martin or a Gibson. Drums sound like drums, with all the air and transients retained.

*What other equipment is in there?*

The main monitors are Genelec 1038As. Multitrack machines are Ampex 1200s, 16- and 24-track. There's an Otari RADAR 24-track hard disk system, a good selection of vintage valve mics, Vac Rac, valve mic preamps, Massenburg EQ, vintage Audio and Design parametric EQ, UREI black 1176 compressors, TL Audio valve stereo compressors, dbx compressors, vintage BX20 spring reverb, and a Roland Space Echo. The equipment has all been designed and purchased with one word in mind: Definition.

*And the studio itself?*

## NEW OLYMPIC MIX SUITE

Olympic Studios added a mix suite this year for engineer/producer Mark "Spike" Stent. Stent, who has been based at Olympic for a decade, has worked with U2, Spice Girls, Man-sun, Hole, Björk and more. The new suite is equipped with a 72-channel SSL 4000 G console (transferred from

Studio 3 when that room was upgraded to an 80-channel G+), Genelec monitoring and Studer A820 multitracks. Also included are 48 tracks of Pro Tools with Pro Control and



Stent's own outboard collection. The suite was designed by Sam Toyoshima and will be available to outside clients when Stent is not using it. ■



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The studio is housed in a converted barn, down a private English country lane on Chris Difford's property. We have two rooms. The main room is about 1,000 feet square with a high, wood-paneled ceiling and wooden floor with a concrete square in the center, which makes for a solid drum sound. There's lots of natural daylight and a soundproof booth with a fabulous mural painted on the back wall. An American engineer working here told me the room was just like one of the rooms at Bearsville Studios, where I

have never worked, but I have enjoyed some of the sounds recorded there.

The pink room is basically a programming room with a 32-channel Mackie desk. The Otari RADAR 24-track hard disk system, I must say, sounds extremely good, considering! We have Pro Tools and all sorts of synthesizer goodies. The Pet Shop Boys are regulars in this room.

*Do you do a lot of the engineering on projects, or are you strictly a studio manager?*

I am still available for projects, though clients do bring in their own engineers and it works quite well. I also have a

staff engineer here named Patrick Moore.

*Any other special services the studio offers?*

We have an extremely amicable arrangement for accommodation with a local hotel. It has eight rooms, three of which are circular—even the beds and the duvets are. It has a bar and restaurant, with an atmosphere you just can't buy. The two brothers who run the hotel are music buffs and men of the world and not afraid to partake in the late-night jollification. It's an extremely friendly and relaxing place to retire after a hard day's work, and it is a five-minute drive from the studio. We are very close to the sea, too, and can arrange diving excursions, windsurfing, boat trips, fishing, etc.

I would also like people to know that at Helioscentric, musicians will be taken care of by musicians who know the rigors of making an album. ■

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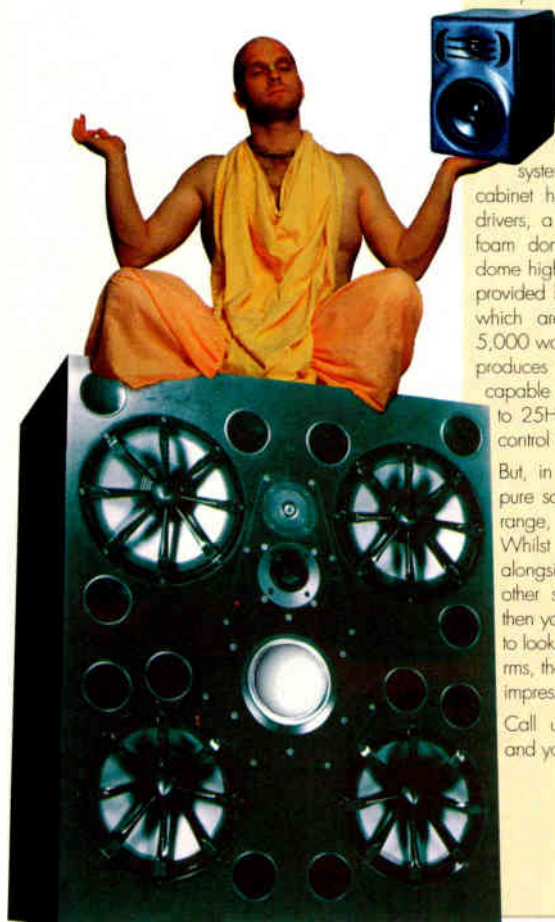
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—FROM PAGE 100, THE BRITISH INVASION

leading candidate. Founded in 1973 by Graham Blyth and Phil Dudderidge (an ex-public school boy who had earned his touring stripes with Led Zeppelin), the company's first product was a 16x2 mixer built into its own flightcase, the Series I. For reasons now lost in the mists of time, Soundcraft opened its first U.S. office in Kalamazoo, Mich., but soon moved to Torrance, Calif., where Southern California sales rep Wayne Freeman was joined by Betty Bennett (now the owner of Apogee) and Shane Morris (who went on to design the Paragon monitor console for ATT).

"The Soundcraft Series IS [successor to the Series I] became the meat and potatoes of the smaller club and rental systems," recalls Freeman, who attributes some of the success of the British-made mixing consoles in the U.S. market to the lack of viable domestic products. "Most of the mixers then in use by U.S. rental companies were either relatively unsophisticated broadcast mixers or had been made by the companies themselves."

Soundcraft's next product, the Series II, became popular both as a live sound desk and as a multitrack recording board. "The personal, or project studio market was booming, and by the early '80s the 800B had become a staple of the touring scene," says Freeman, highlighting Soundcraft's habit of marketing its 8- and 16-bus consoles as suitable



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**INTERNATIONAL UPDATE**

for both recording and live applications. This product strategy had a weakness, however—the resulting designs were very heavy. “I remember dragging a Soundcraft Series 3 into the balcony of the New York Palladium,” recalls Don Pearson of UltraSound, who was then touring with Hot Tuna. “The thing was about the size of an ATI Paragon. It was a struggle.”

Despite their weight, Soundcraft consoles were popular, especially among the engineers working with the endless parade of British bands that toured the

U.S. as the live sound business entered its first major boom period. British-based sound rental company ElectroSound went so far as to commission six custom Soundcraft boards designed to its own specifications. Delivered in ElectroSound’s distinctive blue livery, the Lab Q consoles are generally remembered as the “Santana” boards and are easily recognized by their fluted chrome end pieces, which would now be characterized as retro. Much of the Lab Q design was revisited in the subsequent Soundcraft Series 4 console.

If Soundcraft was the first UK company to cross the Atlantic, then Klark

Teknik was not far behind. Now celebrating its 25th anniversary, the Germanic-sounding company was actually founded by Phil Clarke, an Englishman who emigrated to Australia as a young man and, after returning to Britain, set up a manufacturing business. The company started out making portable car wash equipment but soon branched into audio. In fact, the company’s first professional audio product, the Leevers/Rich 2-track tape recorder, is commemorated in the company’s logo as a stylized tape reel. Phil Clarke’s younger brother was a musician and had spent some time in London’s Decca Duplication Services; it was Terry Clarke (now a principal in the British amplifier company MC<sup>2</sup>) who came up with the design for a graphic equalizer, which was first shown in the U.S. at the 1976 Billboard Disco show. Also attending the show was a young and ambitious sales rep named Jack Kelly, and within a few years Kelly had developed an enviable and apparently insatiable market for K-T’s graphic EQs.

Recalling those days, Kelly, now the owner of pro audio distributor Group One and a principal of XTA, attributes the success of the K-T brand to the product’s aesthetic appeal and roadability. “It certainly wasn’t the price,” he laughs, noting that competitive products from U.S. manufacturers tended to be designed for the decidedly staid broadcast market. One company that was not deterred by the British product’s price tag was ElectroSound, which ordered 150 K-T graphic EQs in the familiar light blue, with “ElectroSound” engraved on the front panels.

**THE EUSTON CONNECTION**

Though most pro audio companies have made custom products at some point, few can claim to have been as flexible in that area as console manufacturer Midas. Started in the early '70s by Jeff Byers, Midas originally made transistorized guitar amps and cabinets before moving on to designing and manufacturing complete sound systems, including speakers, amps and mixers. But Midas got out of the amplifier business after developing a 4-channel, 1,000-watt amp called “the Brick,” named for its considerable weight and unlovely appearance, and instead concentrated on developing high-end custom boards for both live and recording applications.

By the mid-'70s Midas was firmly established, with an enviable list of demanding and discerning clients, includ-

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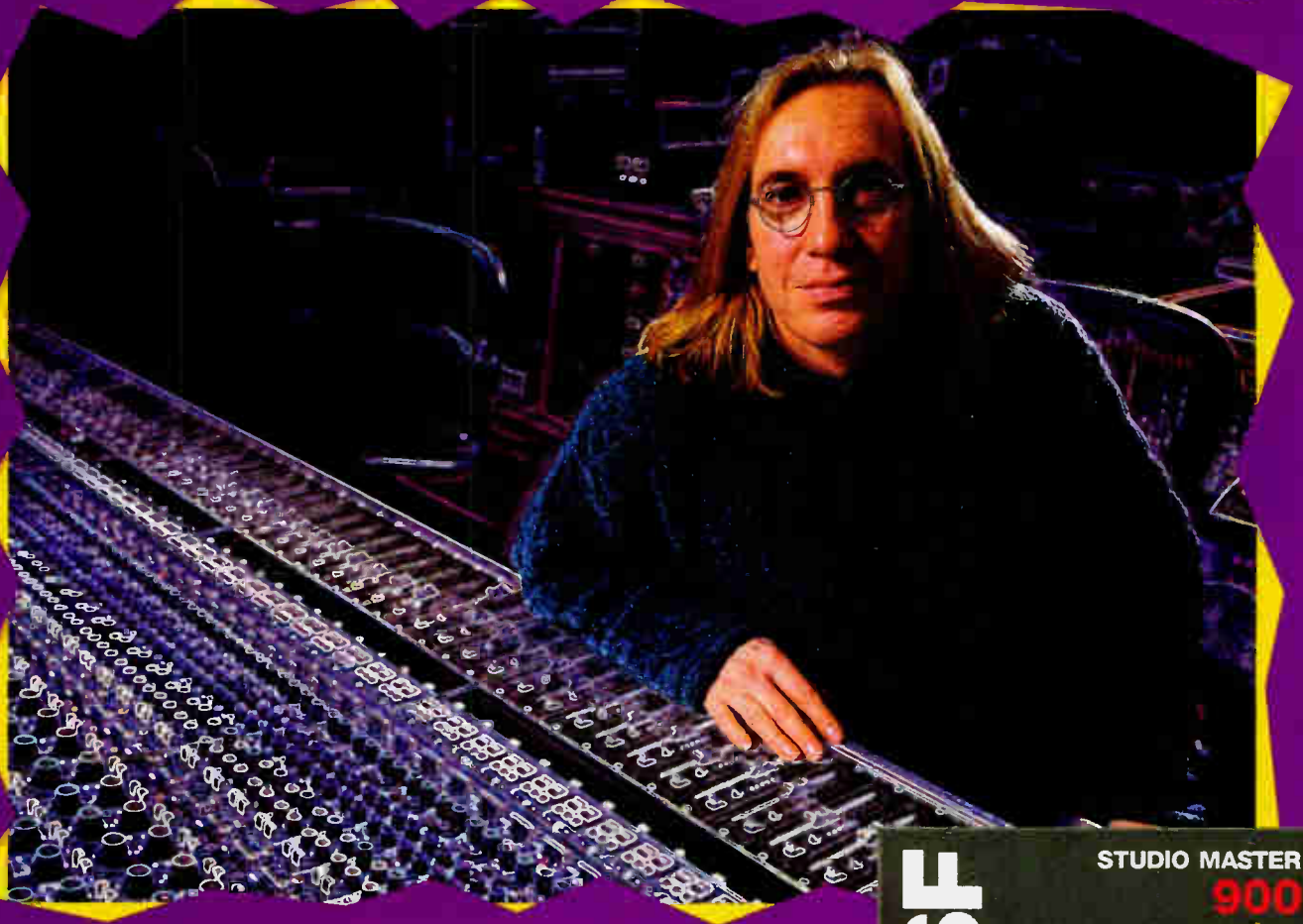
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**CIRCLE #070 ON PRODUCT INFO CARD**



# Chuck Ainlay

Photo: David Crenshaw Studio: Oceanway Nashville



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**Chuck Ainlay** has recorded such artists as **Trisha Yearwood**, **Vince Gill**, **George Strait**, **Wynonna** and **Reba McEntire** during his 20-year career. His recent credits include the **Dire Straits** reunion album **On Every Street**, as well as several **Mark Knopfler** solo albums and movie soundtracks.

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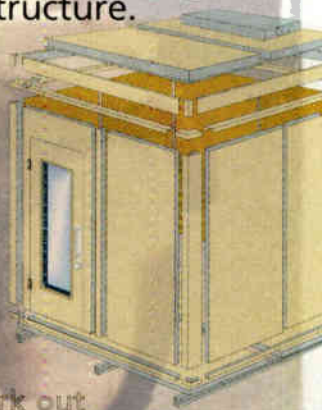


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## INTERNATIONAL UPDATE

ing Pink Floyd and Supertramp. Midas boards were also being specified by live theater sound designer Abe Jacob for such successful and influential productions as *Cats* and *Evita*. But Midas was very much a "cottage industry," and when David Solari (now president of amplifier manufacturer Cyberlogic) joined the company, his main task was to bring some order and rationalization to the company's product line, which tended to branch off in new directions whenever a client ordered a custom input module or console design. It was some years before Midas could even approach the production levels of Soundcraft; by that time Wayne Freeman was selling as many as ten consoles a month in the U.S.

One early feature of Midas' consoles was a built-in crossover, then a fairly mysterious device. As active crossovers became necessary for the new three-, four- and five-way active sound systems gaining popularity in the UK, Midas designer and partner Chas Brooke started making the MCS100, a stand-alone crossover that found a ready market. A new company, Brooke Siren Systems (BSS), was founded in 1979 by Brooke and Stan Gould, and its first product was the MCS200 modular crossover system. BSS was soon represented in the U.S. by Jack Kelly, who faced some initial resistance from sound system rental companies. After all, Kelly not only had to deal with the "not invented here" syndrome, but he also had to promote new audio products imported from a country not known for its high-technology manufacturing skills (a perception that Phil Clarke had implicitly acknowledged by choosing a company name that implied a German engineering heritage—Klark Teknik).

Wayne Freeman, who spent some of his early days at amplifier manufacturer BGW, is unflinching in his assessment. "The British products sounded fabulous, but the power supply designs were a weakness," he says. Though unreliable power supplies were certainly a nuisance for owners of some British consoles, the design flaw was absolutely fatal in an amplifier, and no British amplifier manufacturer has yet made much of an impression in the domestic live sound market, let alone in the U.S.

## BINS AND SHAVERS

British speaker companies, on the other hand, have been among the most suc-

—CONTINUED ON PAGE 228





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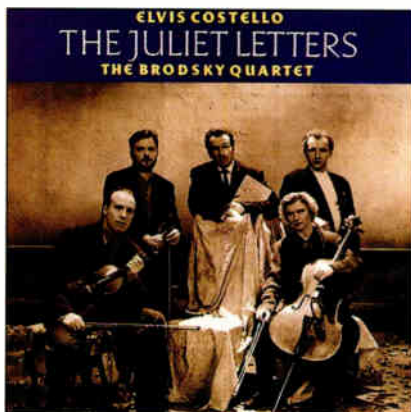
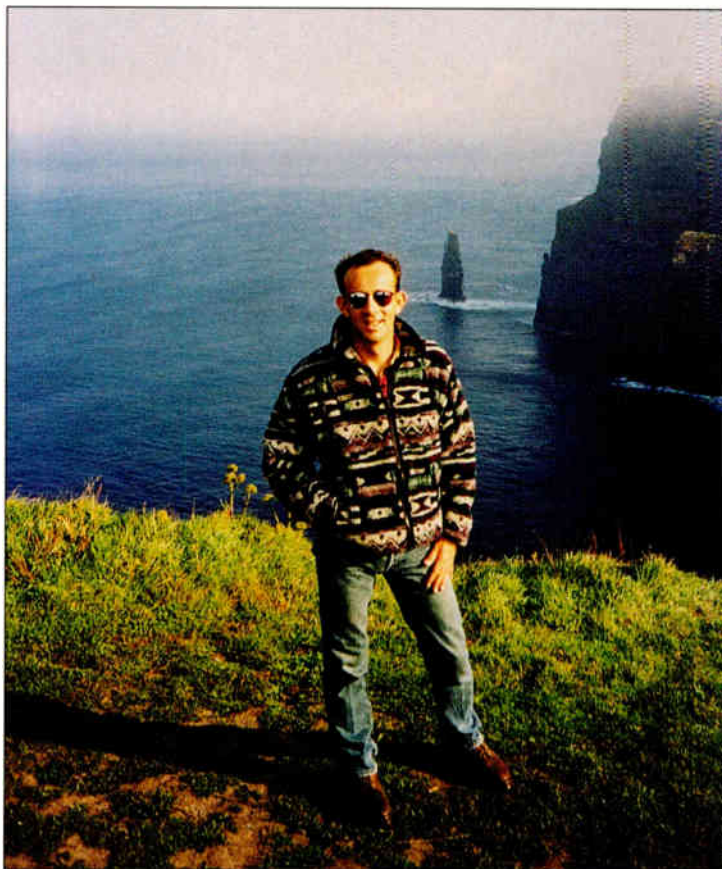
CIRCLE #074 ON PRODUCT INFO CARD  
World Radio History

# KEVIN KILLEN

## ON RECORDING PETER GABRIEL, ELVIS COSTELLO AND MORE

Kevin Killen has worked with some of the most brilliant artists in pop music. His diverse discography is evidence that he's an all-around type, with the ability to go with the flow of an artist's vision while still keeping both feet solidly on the control room floor. That discography contains at least one indisputable masterpiece—Peter Gabriel's *So*. He's done five albums with Elvis Costello, including the much-lauded *The Juliet Letters*, and he's engineered and mixed for U2, Marc Cohn, Shawn Colvin, Jane Siberry, Sam Phillips, Bryan Ferry, Lindsey Buckingham and Kate Bush. His recent work has included mixes for the chart-topping *The Book of Secrets* from Loreena McKennit, and for *Spirit*, Jewel's latest CD.

A resident of Manhattan who was born in Dublin, in person Killen evinces the characteristically



Irish trait of understatement—a kind of bottom-line practicality that doesn't allow for the attaching of undue importance to matters. But under that practical surface are some other characteristics common to the Irish: passion, a sense of humor, a highly literate sensibility, and an innate understanding of magic and romanticism.

When *Mix* visited with him to share a cup of tea at his home on New York's Upper West Side, he was taking a break from mixing for

Columbia artist Kim Sozzi and recording and mixing for Sophie B. Hawkins' latest.

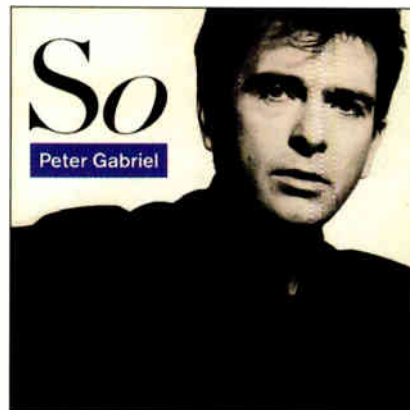
*How's the New York studio scene these days?*

There are a lot of great rooms still, but when I first moved here there were more. There was Power Station, CBS, RCA, A&R, Skyline Studios—a lot of those big tracking rooms don't exist anymore, and it's a shame. I think Hit Factory has the biggest room in the city now, and there's also Clinton, which is a good, big room with an old Neve that's great for orchestras.

*Do you like to work on older equipment?*

Well, I love the way the old Neves sound, and I also like a lot of the new equipment—the Capricorn

console, the new 3348 HR machine, and I've been using Pro Tools when it's necessary to re-jig the tracks. I like technology, but it has to be for the right set of circumstances—not just to say, 'You have to use this because it's what I always use.' The old gear definitely has more personality, but the new

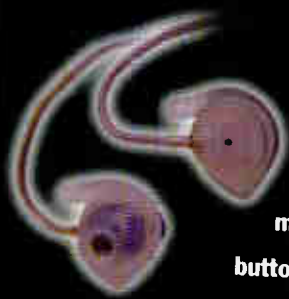


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stuff allows you to do things you couldn't possibly have done ten or 20 years ago. It's a great thing to be able to take five different drum performances, manipulate them and get the best without ending up with a track that feels stilted. You can do that now and still keep life and integrity in a performance.

***I don't think of Dublin as being much of a recording center before U2—how did you get into the business?***

I started in Dublin in 1979. The traditional Irish music scene was actually pretty healthy at the time, with The Chieftains, of course, and Clannad. There was also Thin Lizzy, the Boomtown Rats...

I was in Trinity College studying sciences, but very interested in music, and a friend of mine told me there was a studio in town looking for a trainee. The studio was called Lombard, and the studio manager was this crusty old character named Pat Murphy, who asked, 'Why do you want to work in the studio business? It's late hours, the pay is lousy, you drink way too much coffee and you don't get much sleep.' I said I thought it was interesting work, and he decided to give me a job based on the fact that he liked the jacket I was wearing, which was my father's.

***Oh, come on.***

No, he told me afterwards it reminded him of something he wore in the '40s, so he thought I must be okay. Think of it—some stupid thing like that and I started working at a studio, and I stayed almost two years. It was a jingle house in the morning between nine and one and then an album project studio between two and midnight. At the time the punk/new wave explosion was happening in England, and everyone wanted to be in a band, so the studio let us bring in bands for something like 100 dollars a night for everything. Of course, we'd stay up all night and work, and within six months I was already engineering.

***How did you get to Windmill Lane?***

I worked with this one jingle writer over a couple of months. One morning I did a session with him, and that afternoon he went down to Windmill Lane to work on another session with Brian Masterson, the chief engineer. When

they finished he asked Brian to run off a transfer of what we'd done that morning and, as Brian was doing it, he was listening, and he asked who the engineer was. The client said, "Oh, it's Kevin up at Lombard who's actually quite good." I got a call the next day, saying there might be an opening.

It was the best studio between London and Dublin, and I thought it would be a very good move, so I went and stayed for close to four years. I had to go back to doing assisting, but the



Kevin Killen and Bryan Ferry

longer I stayed, the more engineering I did, and I got to work on some great projects. \*

***What was it like to work with U2 back then?***

It was great fun. At first it was mostly assisting, then more engineering as time went on. The *War* record was the first record I worked on with them, and we did the whole record in six weeks with Steve Lillywhite. The days were really long, and it felt like this little communal project that everybody was in together—you felt that you were part of something special. And working with Steve Lillywhite was an incredible experience. He had great energy in the studio and was the perfect producer for them at that point in their career; he really helped to shape it.

At the end of four years it was, "Shall

I stay a full-time staff person and work in a small market or should I move somewhere else?" That was 1984. My boss, Brian, encouraged me to spread my wings and consider moving—being Irish in London wasn't a big advantage, so I thought I might come to New York. And I came over here, not having a job, not knowing whether I would stay, not really knowing anybody. I just threw caution to the wind. It was difficult—it's not an easy transition to come from a different country. Even though it's Eng-

lish-speaking it involves proper working papers, things like that, although it wasn't as strict then as it is now.

***But even before you got established in New York you found yourself back in the British Isles.***

Yes, Daniel Lanois was to be producing an album for Peter Gabriel. They were going to record in what was actually a cow shed on Peter's property near Bath, England, and originally Daniel thought he'd bring an engineer in for the mix. He knew I'd up and come to America, so he thought I had the courage to tackle the task. Once they got going on the project they called me to come over and help record as well.

***A cow shed.***

Yes, the worst thing is that it really was very cold.

When I arrived there were two analog 24-track machines, a Studer A80, and a Studer A80 shell that had been modified by a local electronics wizard, with its own audio cards and transport controls. A month before I arrived, as Dan explained it to me, and the day before the band arrived for basic tracking, Peter had installed a synchronizer to link the two machines, and somehow the two machines weren't talking to each other properly. The stock Studer had an FM card and the modified Studer had a DC card, and the synchronizer thought they were both FM cards, so there were incorrect pulses being sent to the second machine. The way Peter was working, he had a demo of each song with piano, maybe a Prophet pad and a Linn drum machine, that he would put up on the B machine, which was the modified machine, and he would play that to the musicians in the studio. They would



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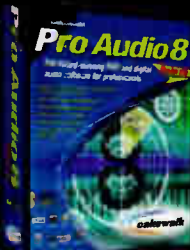
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then play along with that in their headphones, and record all their parts onto the A machine. They'd also copy some parts across from the demo to the A machine. They'd do a couple of takes, say on "Sledgehammer," and instead of leaving the demo reel up on the B machine they would take the first set of performances and put that bit on the B machine, so the musicians could then hear that in their headphones along with the demo rhythms—all that information was getting transferred across to the A machine along with the second set of performances. And they kept doing that, so they could constantly reference quickly back to a part they'd just played.

*They were recording new takes while hearing the previous ones, and running two machines all the time.*

Yes, and what happened was that the two machines were slipping ever so slightly. With each pass the problem got compounded, so that when you took tape one, and locked it up to tape six, they drifted. Add to that the fact that Studer A80s are notoriously unreliable at the front and back of the reel, and it made for a real mess. There were parts of each performance that you simply couldn't sync together.

But they had all these great performances, and it became my job to corral them together. Dan and Peter sat down and built up lists of what they wanted to get, say from tape six to tape one on

the same song, and we planned to somehow edit these pieces together.

I arrived around the end of May, and the first part was getting familiar with the songs. There were musicians coming in during the day, and Peter was working on vocal ideas, so we had to try to isolate a performance that would be the master track of the song, and somehow keep tracks open so that we could edit in the pieces that we wanted from other takes. Late at night, after Peter had left, we'd work on retrieving the tracks we needed.

*The musicians were overdubbing to parts that weren't final?*

Yes, but with Peter—and this is probably true to this day—you're never really sure of what the final part is going to be, because he's constantly writing the lyrics, and seeing what will work. Sometimes he'd come up with a great lyric, and there'd be some part that didn't work with the vocal—so we were constantly changing.

Finally, I decided the best way to proceed would be to edit the multi-tracks into a more structured form and put it on one tape machine that we knew was reliable. In New York I'd used the Mitsubishi 32-track, and I proposed that we should get one. Then I set about editing whatever needed to be done—if there were four reels per song, I would have to do the same edits on each reel and hope they all were good. The process of getting stuff back from slave reel number five to master reel number one involved sometimes lining

## KEVIN KILLEN SELECTED CREDITS

### CO-PRODUCING/ ENGINEERING/ MIXING

Paula Cole  
*Harbinger*

Elvis Costello  
*Kojack Variety,*  
*The Juliet Letters,*  
*Mighty Like a Rose, Spike*

The Commitments  
*Soundtrack and LP*

### ENGINEERING/ MIXING

Elvis Costello and  
Burt Bacharach  
*Painted from Memory*

Sophie B. Hawkins  
*Timber*

Peter Gabriel  
*So*

### MIXING

Jewel  
*Spirit*

Loreena McKennit  
*The Book of Secrets*

Tori Amos  
*Under the Pink*

Shawn Colvin  
*Steady On*

T-Bone Burnett  
*The Talking Animals*

### ENGINEERING/ CO-ENGINEERING

U2  
*The Unforgettable Fire,*  
*Under a Blood Red Sky,*  
*War*

Bryan Ferry  
*Bête Noire*

Patti Smith  
*Dream of Life*



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up the 2-inches and flying between them manually, bit by bit. In July we got an AMS sampler with 14 seconds of sampling time, so we could actually sample four or five measures of music and fly it in that way, which helped. By September we had everything over to the 32-track machine.

*But when you mixed you ended up locking three machines anyway.*

Yes, Peter felt that some things sounded better coming off the analog, particularly certain percussion elements, and he was right. But then, we never really

sat down and mixed, you see. Most records get broken down into periods—pre-production, tracking, overdubs, the mix. With Peter, we never really entered into those phases. We were always mixing. So by October, we'd put up a mix, with whatever overdub had been achieved that day, and I would always store the mix on the SSL and take down documentation. Then, at some point we'd decide, "That's a really good reference for that track," and from then on we'd always reference back to that particular mix. So, if all of a sudden we were having background singers come in, we'd recall the mix

and do all the patches, crosspatches, etc., so that they would hear the best possible interpretation of the song. By the time the album was "mixed," the mixes had already been going on for three or four months. And, of course, the patchbay was a mess. You couldn't see anything.

*Do you remember how you recorded Peter's voice?*

We used a tube 47. Peter always maintained that he'd used a handheld 57 in the control room on his previous records. Dan and I were skeptical, so we did a test. We set up a bunch of mics, and we blindfolded Peter and had him sing into each and tell us which one he liked the best. It came down to one, and he was sure it was the 57. When we took the blindfold off, of course it was the 47.

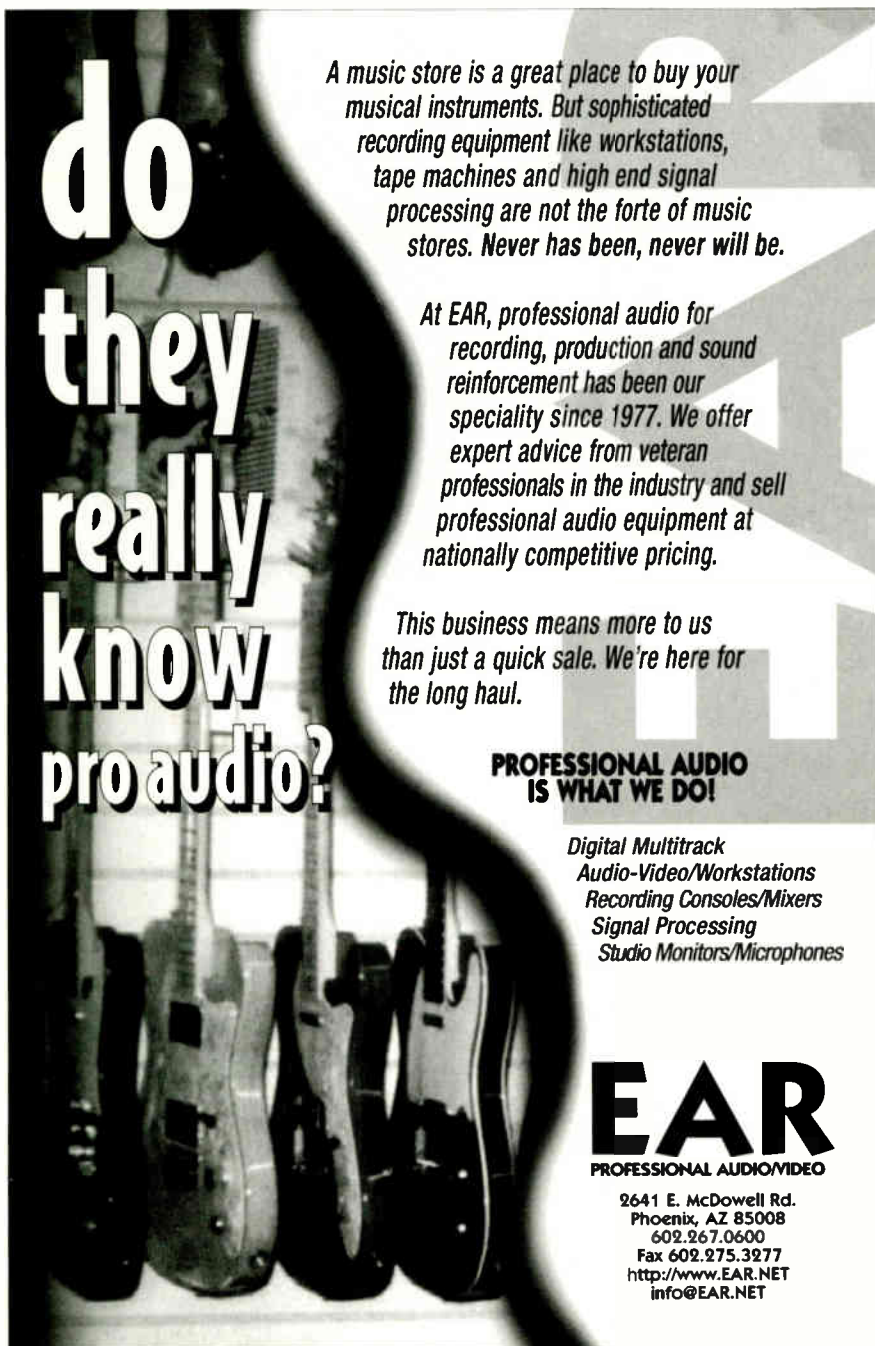
But there was a funny sound to that

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47. It had much more air than you would normally expect—very pleasing sounding, but not as much bottom as you'd expect. We had our maintenance guy, Neil Perry, take a look and it turned out that one of the cables had a little nip in it. It wasn't getting full contact on the shield, and when he reconnected it back up it sounded much fuller—but the presence that we loved was gone. So we rigged up a system where we plugged the output of the mic into the patchbay, and we took the shield off a regular patch cord and used a mult of the two things; we brought the mic up on two faders to duplicate that sound—the regular 47 and the dropped shield version of it—and we'd balance between them.

*What about the rest of the chain?*

Peter had an old Decca compressor, kind of like an LA2A, very smooth, very slow. I set it up for a minimum amount of compression. I chose not to use a lot



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of EQ, mostly because I knew we'd be dropping in lines further down the road. We'd have EQ on the monitor side.

**What outboard equipment did you have?**

We had an AMS DMX1580 and an RMX16, an EMT 140 plate, and we used the studio as a chamber. I recall a Sony DRE1000 reverb unit, four Decca compressors, a couple of LA2As, and tape slap. Not a lot of outboard—we printed effects as we went along. The console was very small; I think just 56 in. We only had six echo sends, because I was

using so many of the small faders for tape returns, and we had to constantly figure out different ways to get into devices. We would often chain effects together—send a signal to the AMS for delay, then out of that into another delay, like the Deltalab DL2 with the extra delay module that gave almost a second of delay time. We'd do a lot of things that would shimmer back and forth, then come out of that and patch into a reverb: By sending one thing you could get three effects.

**Did you know you were working on a great record?**

We knew it was good, but I don't know

that we knew it was going to be one of those hugely successful records, because it took ten months and by the time we were finished we were just relieved to be done.

I sent a copy of the record to my friend Randy Ezratty in New York, and after he listened, he said, "You're going to get so much work from this, you have no idea." And he was right. The *So* record was very pivotal for me. I'm sure without it I would have had some success, but that tended to put me in a different place. Since then I've gone through periods that got a little dry, but for the most part people say, "You've done that record and you've done this record, therefore there's a level of consistency between all your work." Which is really what you want people to look at—you want them to judge you from your whole body of work, as opposed to just the last record that you did.

**Your credit on Elvis Costello's *The Juliet Letters* reads "recorded, engineered and balanced by..."**

Yes, it really was a capturing of a performance in a room, and I think Elvis wanted the credits to accurately reflect that. We didn't do any editing between tapes, and there were no drop-ins. We found a space we thought would sound good for the quintet, a studio in London called The Church, owned by Dave Stewart of Eurythmics, and we set about just trying to capture that sound—unlike some records where you reshape the sound of the record or you redirect it, perhaps in a direction the artist had never imagined going.

They'd performed the pieces in a couple of different venues in London, and had settled with a setup they liked—two violins, Elvis in the middle, then viola and cello—and that's how he wanted to do it. But it was such a big space, and so live, that when Elvis started singing he basically drowned out the quartet.

**He was using monitors?**

No, he was just singing into the room and was still overpowering the quartet. So I built a little house with a hutch on top using baffles and gobos. The sightlines were clear, he was still in the same space as everybody else, but his voice was more contained from the other microphones. I spotted a couple of mics around the quartet, and a couple of stereo room mics and a vocal mic, and that was it. I set the balance, then Elvis worked the vocal microphone, and if the quartet felt something was wrong with the balance, they would adjust themselves.



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## MIX MASTERS

It was a fun project, because what you heard was what you'd be getting on the record. You weren't ever thinking, "Well, when we put the horns on here it's going to be so much better," or "When we add drums..." If it didn't work as a quintet it was never going to work.

Some people have a hard time with that record. They think Elvis stepped out of his element and pushed the boundaries too much. But that's what I love about working with him—he's interested in all kinds of music and he wants to explore that. He takes a lot of chances.

It's always a pleasure to work with someone like that. You know the record is going to be of a certain quality and that vocally the performances are going to be spectacular, with a certain emotional intensity attached, be it good or bad. They are intense records, both to

**I learned from**

**Steve Lillywhite and**

**Dan Lanois**

**to commit to sounds**

**and performances**

**early on.**

make and to listen to. It's a rollercoaster, but at the end of the day you can say, "This is a really honest piece of work."

*What mics did you use?*

One was a Calrec stereo Sound Field. From the control room you could control the shape of the pattern—you could listen on headphones and decide how much of the M/S pattern you wanted, and you could turn the angle around. Other than that, Neumanns—67s on the violins and violas, TLM170s on the cello, and for Elvis a 47.

*You do your own engineering when you produce—it's a big job to do both.*

It is, but there's a rationale that labels apply when they're looking for a producer/engineer. Some of it's financial, because they feel they can get two for the price of one, but also they realize that part of your production values are inherent in the sound you get.

It's a style. Obviously, I developed my craft as an engineer, starting as an assistant, progressing through junior en-

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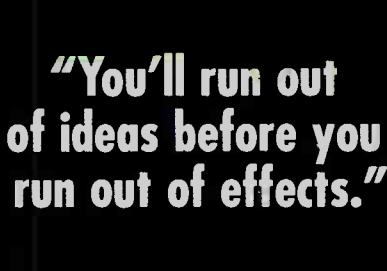
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Scott Martin Gershin's film credits include:  
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gineer to engineer to producing. I didn't start out to be a producer; I just always felt that my role was to help make the recording the best possible. I did whatever it took to make the session go as smoothly as possible and to be as creative as possible. At some point people started taking that as an indication that I was capable of producing. Making suggestions, trying things out—it was a natural way to go, and when someone offered me a chance to produce I thought, "Well, I'll try it."

Production really is a black art, and it seems at labels these days, everybody thinks the producer is the most important cog in the wheel. But that's not necessarily true. A good producer can't turn a bad song into a great song. You can make it sound great, and get interesting performances, but if the songs aren't there, it really doesn't matter.

I don't produce records back to back—I do one or two records a year. I'd like to do more, but it's not my driving ambition to only produce. I do a bunch of mixing projects, and sometimes I'll do just straight engineering. Like with Elvis and Burt [Bacharach].



Kevin Killen in the studio, Bath 1985

where it was just great to be involved. *So you're more project-oriented than role-oriented.*

I want to produce those artists that I really have an affinity for, because if you spend three months in a room with somebody and you don't like them, it's a very long time.

If it's someone you haven't worked with, you have no idea what they're going to be like. You have no idea what kind of strange behavior they might exhibit, or what they might perceive as your strange behavior. You're in that melting pot of the studio, and the pressure's on to make a hit record,

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or a successful record—God knows what's going to happen. You've got to make sure you like the person enough to hang out with them for three months. *What equipment do you own?*

A rack of 1064A Neve mic preamp and EQ modules, which I picked up at Ocean Way years ago, a TC 2290 and a 1210, a couple of Eventides, a bunch of API 560 graphic EQs, a Manley stereo compressor, a bunch of Distressors, some mics, a bunch of pedals and boxes. I also cart around my own amps, speakers and cables. I use

ProAcs. They're English speakers that I use with a Cello amplifier. I got turned on to them by Randy Ezratty and by Bob Ludwig.

I also have a little portable SADIe workstation, which I really like. I use it for flying stuff around or album sequencing. SADIe is a great company, very dedicated—when I bought the unit they convinced me to put a modem into it, saying, "Your learning curve will be slow in the beginning, you're going to make mistakes, and that way you can just call us, and we'll call into the machine." That's what I did; they would call into the machine and I'd be on the

other line, and they'd control it from their office in Nashville. I was getting a tutorial over the phone.

*How would you describe yourself as an engineer? You don't seem to be hard and fast about anything.*

You can't be hard and fast, because every situation is different. Even though you may be recording the same combination of bass, drums, guitars, vocalists, there will be something unique about that particular combination that you won't have encountered before. The room, or the performance ability, or the instrumentation—you have to be a bit of a chameleon and to move around and adapt quickly.

It's easy to go astray. And that's a function of the methodology of the producer and the recording engineer. I learned from Steve Lillywhite and Dan Lanois to commit to sounds and performances early on. The most important thing is to make decisions and not to leave choices until the last minute, because then you're left with too many options. And, in the studio, when you have to sift through all the various permutations it could take two days. That drains your energy. It's better to commit.

I'm mixing a project right now that has 96 tracks of material. It takes seven or eight hours just to sift through and get organized; it doesn't fall naturally to the fingertips. You're stretched out all over this huge console and you can't get things condensed enough to where you feel like you control the track. Instead it's controlling you. You're just fighting to get the beast under control so you can do your job of making it a better record. All you're doing is thinking about where that sound is coming in, and you're looking at the meter bridge trying to find out where these tracks are—there's three machines synched up and you're thinking, why do people work this way?

So for the most part I work 24-track if I can.

*Is there a philosophy that has guided your career?*

Well, Daniel Lanois gave me a great piece of advice in 1984 during the making of U2's *The Unforgettable Fire*. He told me to concentrate on one or two disciplines and become an expert at them. Rather than be a jack of all trades, become an expert at whatever is important to you. And I'm still trying to do just that. ■

*Maureen Droney is Mix's Los Angeles editor.*

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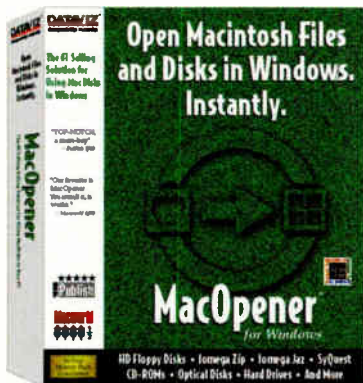
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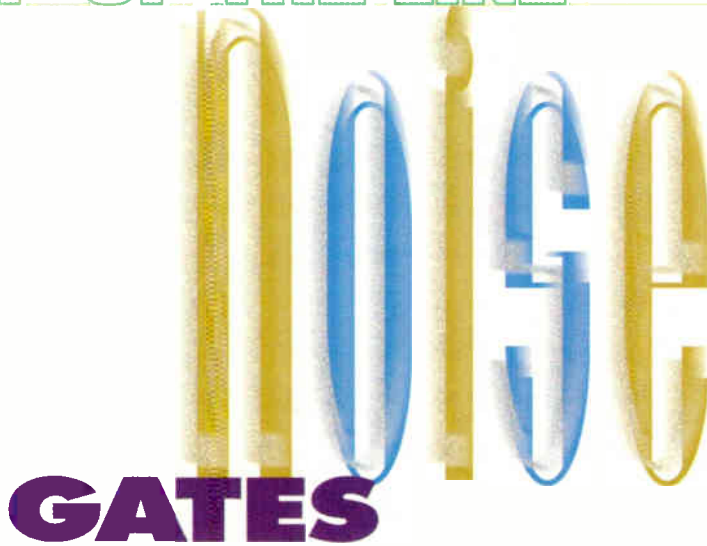
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## TOP-OF-THE-LINE



# GATES

Of the various audio devices grouped under the heading of “out-board gear,” noise gates are seemingly the least complicated. They open, they shut. Unlike EQ and reverbs, gates neither add nor subtract from the signal, and though the gate/expander may be thought of as a compressor/limiter in reverse, the audible effects of a properly adjusted gate are rarely held to be desirable. All of the adjustable parameters on a gate are designed to help make its operation inaudible, or at least unobjectionable.

The primary function of a gate is as a fix-it tool, yet there are some creative applications for gating and expansion. Though most commonly used to control leakage in studio and live performance, and to mute noisy tracks, gate/expanders can also be used to create special dynamic effects. Just as compression can reduce the dynamic range of a signal by a selectable ratio, expansion can increase the dynamics of a signal. Also, most gates provide a key input, which can be used to tailor frequency-conscious gating and expansion. This feature enables an engineer to “tune” a gate to open on a tom-tom hit while remaining closed for cymbal crashes, for example. The key input also allows the attack and decay envelope of one instrument to be reshaped by another. Thus, a bass track may be “keyed” by the kick drum track, which results in the bass appearing to play only in absolute sync with the kick drum.

An

Open

And

Shut

Case

BY CHRIS MICHIE



dbx 904



Drawmer DS201



ARX Systems Sixgate



Symetrix 562E



Aphex Model 622



Furman Sound QN-44



Valley Audio Model 451 GateX II

Perhaps due to their specialized nature, there are fewer manufacturers of gate/expanders than of other signal processing categories. Of course, many compressor/limiters also include a gate and/or expansion function, as do some EQs and even a few reverb devices. But for this article, we've concentrated on those devices that are solely designed as gate/expanders, and we have restricted the list to include only one top-grade device from each manufacturer.

The Aphex Model 622 Expander/Gate incorporates proprietary detection circuitry and Logic Assisted Gate Circuitry for positive, stable and accurate triggering regardless of attack time. Trigger threshold, attack time, hold time, release time, expander ratio and attenuation range are fully adjustable. Additional features include parametric key input filters with 24dB/octave slopes and a key monitor headphone jack that allows the key input to be monitored without disrupting audio output. A dedicated downward expander mode offers ratios from 1.2:1 to 10:1, and there is a switchable ducking mode. I/Os are servo-balanced and +4/-10dB operation is rear panel selectable. The 622 uses high-quality VCAs providing a stated dynamic range of 119 dB, and the unit includes a five-year limited warranty. Price: \$795.

The Sixgate™ 6-channel noise gate from ARX Systems offers fast, low-noise circuitry and an intuitive, user-friendly layout. Attack time is program-dependent—a circuit tracks the incoming signal to automatically determine optimum gate response—and front panel controls for each gate include threshold, depth and release. Each of the six low-noise, opto-isolated gates has its own sidechain key input, a hard-wire bypass switch and a blank panel above each gate for writing gate assignments. I/Os on insulated TRS jack connectors are true differential balanced. AC power input is via a standard IEC connector, with built-in fuse and voltage switch. Price: \$460.

The Behringer Multigate Pro XR4400 4-channel expander/gate has an Interactive Hold Control that automatically applies a hold element, depending on the release time chosen for natural fade characteristics. Hold and release parameters are also manually adjustable. The unit operates as two stereo gates, one stereo and two mono gates, or as a three- or four-way linked gate. Also included are parametric sidechain filters with sidechain monitor, and level/threshold and gain reduction displays. XLR and TRS I/Os are servo-balanced. Price: \$249.99.

The DPR-522 Dual Gate in BSS Audio's Opal Series offers a comprehensive array of features

including a ducking function. A parametric key filter precisely tunes the trigger signal, with filter width adjustable to a tenth of an octave. A Key Listen switch allows quick filter adjustment by ear. A momentary Check Key function forces the gate open for monitoring the below-threshold signal. In addition to adjustable threshold/attack/hold/release controls, the range control sweeps from open to -80 dB of gain reduction. An LED signal meter indicates the key signal strength relative to the preset threshold, along with a two-LED Open-Shut indicator. Auto Dynamic Enhancement is designed to restore punch when slower attack times are selected on transient-rich signals such as drums. I/Os are balanced XLR; the sidechain inserts are balanced TRS jacks. Price: \$799.

Part of the dbx 900 Series of modular signal processing, the 904 expander/gate module incorporates dbx's OverEasy® action for smooth onset of gating. Attenuation limit, attack and release rates and threshold are all adjustable. The 904 features a Programmed Latch mode that mutes a channel until an above-threshold signal is present. It then latches open until reset. The 904 can act as a very fast voltage-controlled, below-threshold

downward expander. It senses the level of an input or keying signal and determines whether the level is below threshold. If it is, the signal gets attenuated; if not, it passes at unity (0dB) gain. The amount of signal attenuation is a function of its own level and the 904's

decay and range controls, the DS201 features variable highpass and lowpass filters for frequency-conscious gating. (Drawmer pioneered the concept of frequency-conscious gating, and the DS201 was the first noise gate to include this feature.) Additional features

## Though most commonly used to control leakage in studio and live performance, and to mute noisy tracks, gate/expanders can also be used to create special dynamic effects.

Attenuation, Limit, Ratio and Threshold settings. Additionally, two 904 modules can be strapped for stereo operation. Price: \$299.95

The DS201 Dual Noise Gate from Drawmer is a 2-channel unit that incorporates a number of features pioneered by Drawmer and not found on conventional noise gates. In addition to comprehensive envelope, attack, hold,

include a key input for external triggering, a key listen facility and three-color "traffic light" LEDs to indicate gate status. Each channel may be used separately for gating or "ducking," and the unit is stereo-linkable. I/Os are balanced. Price: \$735. Drawmer also makes the model DS404 (\$1,050), a 4-channel unit that is similar to the DS201 but adds selectable hard/soft gate action.

The Furman Sound QN-44 Quad Noise Gate features four independent noise gate channels. Features include a threshold control adjustable from "on" to +20 and attack time adjustable from 50 µsec to 50 msec. Release time is adjustable from 5 msec to 5 seconds, and attenuation is adjustable from 0 to 80 dB. A Key Input on each channel allows gating action to be controlled by external signals, and an LED indicates when each gate is open. Additional features include ground lift and on/off switches. Price is \$429 (or \$565 with optional XLR balanced I/O).

The M644 Noise Gate from JBL offers four discrete channels of gating in a single-rackspace unit. Threshold, attenuation, attack and release parameters are all independently adjustable, and the threshold control provides an 80dB range. External key inputs on each channel allow for gate triggering by an external source. The unit features wide dynamic range (115 dB) and features both low distortion (THD 0.03%) and a flat response from 10 to 40k Hz. Switchable subsonic filters guard against low-frequency transducer damage. Price: \$515.

Klark Teknik's DN514 Quad Auto Gate, a 4-channel gate in a single-rack-

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space chassis, offers extremely low-noise performance and fast operational setup. Each channel has variable threshold and release controls, as well as high- and low-frequency filter controls for frequency-conscious gating. Attenuation is >84 dB when the gate is closed. The unit offers two selectable semi-automatic attack times, and hold time is automatically scaled to the adjustable release value. A sync function allows all four gates' release times to be synchronized. Each channel offers a key input on a TRS connector, and a sidechain monitor function simplifies setup. Master and channel bypass switches are also provided. Inputs are electronically balanced XLRs; outputs are unbalanced (transformer balancing is optional). A tamper-proof front cover is also available. Price: \$1,144.

The Symetrix 562E Windowing Expander/Gate is a 2-channel unit featuring proprietary Window Advance circuitry to optimize the attack envelope by slightly delaying the input signal, thereby enabling the gate to open ahead of the signal's leading edge. The 562E also includes an Auto Windowing function that reduces pops and clicks at fast gate settings and yields a natural-sounding envelope. Controls include individual threshold/attack/hold/release controls, plus a pot that determines gate range (up to 80 dB) or expander ratio. Low- and high-frequency filters enable frequency-conscious gating/expansion, and a key listen facility monitors the key signal pre or post the key filter. Front panel switches engage the two Window Advance modes and the external key input. LEDs indicate gate action and gain reduction (60dB scale). I/Os are both XLR (balanced) and TRS (balanced/unbalanced). Price: \$579.

Valley Audio offers the Model 451 Gatex II 4-channel expander/gate. Front panel controls include threshold (60dB range), range (up to 80 dB) and release time controls. A Program Controlled Sustain function automatically lengthens release time depending on signal content. In the single gate mode and in one of the two expander modes, the Gatex II attack time is a very fast 10 msec. In the second expander mode, Program Controlled Attack varies attack time between 5 msec and 25 msec, depending on the input signal. A key input is switchable from the front panel. I/Os are XLR and key input is TRS. Price is \$699. ■

Chris Michie is a technical editor at Mix.

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The Yamaha MSP5. No other speaker can hold a candle to it. So, get to your nearest Yamaha Pro Audio dealer and prepare to be blown away!



# PREVIEW

## TASCAM PRO DAT RECORDER

Tascam (Montebello, CA) intros the DA-40 professional DAT recorder, which replaces the DA-30 MkII. New features include a trim control for the analog XLR outputs, character pack recording and playback, two locate points, variable Auto ID time settings, auto End ID recording, variable record mute time and programmable repeat times. Supported sampling rates are 48, 44.1 and 32 kHz, and the unit will record in 16- and 12-bit modes. Analog I/Os include balanced XLR and unbalanced RCA; digital I/Os are AES/EBU and S/PDIF. Price is \$1,399.

Circle 327 on Product Info Card

## FOSTEX 8-TRACK HARD DISK RECORDER

The D-108 hard disk recorder from Fostex (Norwalk, CA) offers simultaneous recording/reproducing



recording media. Features include a graphical preview function for fine editing, a six-point edit memory and 99 locate memories. Digital I/Os include optical S/PDIF and ADAT connectors; balanced +4 analog connections are via D-sub 25-pin connectors. Options include a timecode sync card for slaving to LTC, video reference and word clock. The D-108 with removable hard drive is \$1,495.

## EQUI=TECH BALANCED POWER SYSTEMS

Equi=Tech Corporation (Selma, OR) re-engineered two of its rackmount balanced power systems, re-

ET1.5R. The 10-amp ET1R remains unchanged and costs \$889.

Circle 328 on Product Info Card

## HNB CIRCLE 3 MONITORS

HNB Communications USA (Los Angeles) adds the Circle 3 to its line of active and passive Circle monitor loudspeakers. Available in active (\$895/pair) and \$495/pair passive versions, the Circle 3 combines a 5.5-inch woofer with a Ferrofluid-cooled soft-domed tweeter in a 10.6-inch high cabinet. The active version has two 60-watt amps and both balanced XLR and unbalanced RCA inputs (switchable).

Circle 329 on Product Info Card

## BENSON CONDENSER MIC

Benson Audio Labs (McMurray, PA) offers the PC11 low-cost condenser microphone, a cardioid pattern, externally polarized, condenser type (requires 48V phantom power). Featuring a low mass Mylar diaphragm, the PC11 can accept SPLs in excess of 140 dB without distortion and has a frequency response of 80 to 18k Hz. The PC11 is \$179.90.

Circle 330 on Product Info Card

## ANTARES MICROPHONE MODELER

Antares Audio Technologies (Los Gatos, CA) unveils the AMM-1 Microphone Modeler, a DSP-based unit containing precise digital models of a wide variety of microphones. The user simply selects the actual microphone in use and the desired mic to be modeled; the AMM-1 performs the necessary processing. In addition to containing sonic models of current microphone models, the AMM-1 includes models of the effects of specific mic options, such as low-cut filters and windscreens. The mic model library is updateable with software downloads from the Antares Web site.

Circle 331 on Product Info Card

## AMEK 9098i CONSOLE

The 9098i Recording and Production Console from Amek (Nashville) is an in-line console, available in frame sizes from 48 to 120 mono channels. Optional Dual Stereo modules each provide two stereo inputs. Inputs feature Rupert Neve's acclaimed 9098 EQ and dynamics processing, plus motorized Penny & Giles faders for both signal paths on each input module. Its 48 buses can be grouped for LCRS format, in addition to an LCRS main mix bus. Four additional stereo buses allow for five-way and six-way multi-format surround.



on eight tracks and features an additional 16 virtual tracks and 99 song programs. Available with a variety of removable hard disks, the D-108 includes an interface for backup to external SCSI devices and also supports the .WAV format for data transfer to and from external DOS-formatted

during their size, weight and price. Both the ET2R 20-amp and the ET1.5R 15-amp models have been reduced from 3U to 2U dimensions and weigh approximately 15 lbs. less than previous models. Prices have been reduced approximately 8%, to \$1,389 for the ET2R and \$1,189 for the





# PREVIEW

There are 16 mono and stereo aux buses, with a total of 76 balanced mix buses. The 9098i's Super-true™ dynamic automation system has a redesigned user interface with extensive on- and off-line functions. Additional features include built-in machine control, a high-res TFT color screen and a comprehensive range of patchbay and metering options.

Circle 332 on Product Info Card

## FURMAN MONITOR ROUTER

The SRM-80 Signal Router/Monitor from Furman Sound (Petaluma, CA) enables a user to switch easily between a console's output, up to four stereo playback devices (CD, DAT, cassette, etc.) and up to three pairs of speakers. Balanced XLR connectors are provided for Source and A inputs and amplifier sends, and there are individual level controls for each set of speakers. B, C and D inputs are via RCA jacks, and the SRM-80 accepts both +4 and -10 input levels. A Source Select function allows dubbing between the various sources (which may be monitored on headphones), and a 2-channel 40 LED bar graph offers both VU and PPM modes. Additional features include Mono and Dim switches and a \$79 optional



remote control. The SRM-80 is \$399.

Circle 333 on Product Info Card

## GENELEC DIGITAL MONITORS

Genelec's (Natick, MA) 2029A Digital Stereo Monitoring System has compact near-fields based on the award-winning Model 1029A, analog active monitor speaker. Featuring internal, low-distortion dual amplifiers, the system is capable of 110dB peak SPLs; a volume knob on the right speaker controls overall stereo volume. The 2029A's S/PDIF digital input accepts 24-bit word length signals, and dynamic range is better than 101 dB. The 2029A's vented cast aluminum enclosure has a mag-shielded 5-inch LF driver; highs are handled by a 3/4-inch metal dome tweeter coupled to

## SONY OUTBOARD ADC/DAC

Sony Professional (Montvale, NJ) debuts the SRP-DC5 2-channel analog/digital and digital/analog converter, housed in a single-rackspace chassis and featuring a 24-bit input stage sampling at 44.1 or 48 kHz. The unit also accepts digital inputs via AES/EBU or S/PDIF inputs in 16/20/24-bits. Its AES/EBU digital outs are selec-

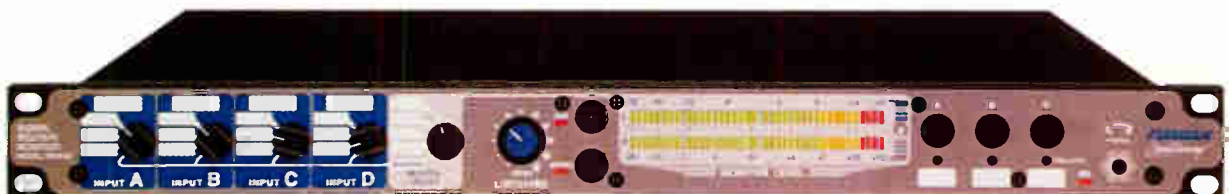
a Directivity Control Waveguide. Price is \$1,325/pair.

Circle 334 on Product Info Card

## NEW BEYER MICS

Beyerdynamic (Farmingdale, NY) has introduced the MCE 93 condenser microphone, a pencil-type model featuring a cardioid pattern, excellent bass response and low-noise characteristics. Frequency response is 30 to 20k Hz; max SPL is 139 dB. The phantom-powered MCE 93 is supplied with an elastic suspension; a windscreen is optional. Price is \$599. Beyer's M99 is a hypercardioid dynamic mic with a two-position switchable presence peak. Featuring a neodymium magnet system and a low-mass Mylar diaphragm, the M99 handles very high SPLs without distortion.

Circle 335 on Product Info Card



## PREVIEW



table to 16/20/24 bits. Dual 20-segment peak hold meters indicate input levels. The SRP-DC5 can sync to an AES/EBU signal or external wordclock at 44.1 or 48 kHz. I/Os are balanced XLR analog and AES/EBU digital.

**FOCUSRITE COMPOUNDER**

Focusrite (distributed by Group One, Farmingdale, NY) debuts the Com-Compounder dual-mono/stereo-linkable compressor/limiter/gate, the third unit in the company's Platinum range processors. The unit features low distortion, Class A amp circuitry, and soft- and hard-knee compression with a wide range of ratios, plus separate limiting threshold. A bass expander circuit compensates for apparent bass loss in hard compression and limiting situations. The opto circuit gate is exceptionally quiet and includes an expander option. Inputs are both XLR and TRS, +4 and -10dB switchable. A key input for triggering the gate sidechain is inserted on a balanced TRS and may be switched from the front panel. Price: \$899.

Circle 336 on Product Info Card

**HOT OFF THE SHELF**

Tascam's Version 3.0 software for the MMR-8 and MMP-16 modular multitrack recorder/player features playback support for Akai DD-8 and Zaxcom Deva files, MIDI Machine Control, varispeed and Serial Transport modes and an optimized SCSI driver. The free software can be downloaded from [www.tascam.com](http://www.tascam.com). Metro Music Productions has released "The Big Red M," a new 99-track volume in the 3-CD Hot Spots collection of 30-second music beds. Call 212/229-1700. CRC Press offers the *Comprehensive Dictionary of Electrical Engineering* and the *AC Power Systems Handbook*. Call 800/272-7737 or visit [www.crcpress.com](http://www.crcpress.com). Nemysys Music Technology has introduced a 512 voice, 40-gigabyte sampler. A fully configured system provides 40 gigabytes of sampling (expandable to 72.8 GB), 512 voices of up to 4GB in size, and 48 output channels of 20- or 24-bit audio. Call 310/470-2231 or visit [www.nemysmusic.com](http://www.nemysmusic.com). TC Electronic's Unity card for the Yamaha 02R digital console now

also offers TC's Finalizer studio mastering technology and 24-bit ADAT/TDIF I/O hardware. Call 805/373-1828 or visit [www.tcelectronicusa.com](http://www.tcelectronicusa.com). Prompt Publications offers *Practical Acoustics*, an in-depth study of the science, by Stephen Kamichik. Other available books: *Simplified Digital Signal Processing*, *Electronic Circuit Guidebook Volume 5: Digital Circuits* and the Semiconductor Cross Reference CD-ROM. Call 800/428-7267. For a data sheet describing applications for sound absorbing panels in challenging acoustic environments, call Eckel Industries at 617/491-3221 or visit [www.eckel-acoustic.com](http://www.eckel-acoustic.com). Sweetwater Sound's Total Stereo Session Drums CD has been remapped for E-mu samplers by Alternate Mode. Call 800/222-4700 or visit [www.sweetwater.com](http://www.sweetwater.com). NetWell Noise Control's Fireflex Class A, fire-rated, sound absorbing foam panels are designed for wall application and are supplied in 2x4-foot sheets. Call 800/638-9355 for free samples and spec sheets. Wireworks TEC256 Multipin Cable Tester won a Sound Product of the Year/Honorable Mention awarded by *Lighting Dimensions* and *Entertainment Design* magazines at the recent LDI98 trade show. Independent Audio now distributes mics from Pearl Lab of Sweden. Call 207/773-2424. New

accessories from Rolls: the MX54 Pro-Mix III is a 3-channel mic mixer; the MX56 Playmate mixes two 1/4-inch line or instrument signals, two RCA inputs and a single mic input, outputting via 1/4-inch and RCA connectors; the MB15 Matchbox II converts stereo unbalanced signals at -10 levels to balanced stereo line-level signals at +4 levels, and vice versa. Call 801/263-9053 or visit [www.rolls.com](http://www.rolls.com). Take a cybertour of the Svetlana vacuum tube manufacturing plant in St. Petersburg, Russia. Click on [www.svetlana.com](http://www.svetlana.com). Belden Wire & Cable Company has introduced three new products in the Brilliance® family of cables for audio and broadcast markets, including a new audio snake cable. For more information, call 800/BELDEN-4 or visit [www.belden.com](http://www.belden.com). The 1999 CAIG Laboratories Catalog lists a range of products suitable for cleaning and protecting electrical contacts and connectors. Call 619/486-8388 or visit [www.caig.com](http://www.caig.com). SSL's Axiom-MT digital console now reads SL 4000 G and SL 9000 J Series automation data. Channel and group fader, and CUT automation data from mixes done on SL 4000 G and SL 9000 J consoles is readable by the Axiom-MT, and track lists, cue lists and snapshot data can be imported from SL 9000 J consoles. ■





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# NEW SOFTWARE/HARDWARE FOR AUDIO PRODUCTION

## AARDVARK AARK DIRECT PRO

Aardvark ([www.aardvark-pro.com](http://www.aardvark-pro.com)) offers the Aark DIRECT PRO, a 4-input, 20-bit digital audio converter for direct recording to a PC. Featuring four XLR/TRS combo inputs, the unit includes a breakout box with mic, line (+4/-10 dB) and instrument-level inputs, a PCI host card, plus software and connecting cables. Features include phantom power, 20-bit D/A converters and a 24-bit DSP that allows for real-time DSP effects under MIDI control. Supplied software includes Windows 95/98 and Steinberg ASIO drivers. Digital I/O is S/PDIF; AES/EBU I/O is optional. Price: \$645.

Circle 339 on Product Info Card

## DISCMATIC MULTIDRIVE DUPLICATORS

Discmatic ([www.discmatic.com](http://www.discmatic.com)) introduces two new standalone CD duplicators, the MDX7000 seven-drive system (starts at \$4,835) and



the MDX3000 three-drive system (starts at \$3,035). Both duplicators integrate a newly designed SCSI bus that allows faster data transfer. In addition, both units can copy directly from CD to CD and can back up information to a hard drive during copying; a 4GB hard drive is built into both units. Also included is Discmatic's CD Image Management system (including an Audio Compilation feature).

Circle 340 on Product Info Card

## EMAGIC EASI

Emagic ([www.emagic.de](http://www.emagic.de)) introduces a new standard for enhanced audio streaming: EASI, the Enhanced

Audio Streaming Interface. EASI is a free, cross-platform, public interface—no nondisclosure agreements are required. EASI, the core technology of Logic Audio's 4.0 audio engine, is platform-independent and meets pro audio needs such as multichannel support via full-duplex operation and sample-accurate sync. EASI reduces the CPU load by taking advantage of hardware accelerator functions and minimizing data transfers/format conversions; it can emulate important hardware features in software and is based on object-oriented design.

Circle 341 on Product Info Card

## LEXICON DAW INTERFACE

Lexicon's ([www.lexicon.com](http://www.lexicon.com)) LDI-10T analog interface solution for disk-based recording systems features I/O options, DSP, signal routing, and sync and control hardware for Mac- and PC-based audio software applications. Features include ten simultaneous audio channels (eight TRS balanced 1/4-inch and two co-ax S/PDIF), switchable +4/-10dB input gain, 24-bit A/D and D/A conversion and timecode input. Retail is \$799. An optional LX3 Multi-Interface Adapter (\$399) allows as many as

three LDI-10Ts to be linked together, providing 24 channels of analog, TRS balanced I/O and three sets of S/PDIF I/O.

Circle 342 on Product Info Card

## TC WORKS DYNAMIZER SOUNDSCAPE PLUG-IN

The TC Dynamizer from TC Works ([www.tcworks.de](http://www.tcworks.de)) is a studio mastering plug-in for the Soundscape digital audio workstation and the Soundscape Mixtreme PCI card. The TC Dynamizer features multiband expansion, compression and limiting (optimized for mastering) with a streamlined graphical interface and high-resolution level meters with clipping counters and peak-hold indicator. In addition, TC's Look Ahead function allows the TC Dynamizer to be prepared for sudden anomalies in program material. Retail: \$799.

Circle 343 on Product Info Card

## T-RACKS MASTERING SOFTWARE

T-RackS ([www.t-racks.com](http://www.t-racks.com)) is a suite of software applications optimized for mastering. Three processors are included in this standalone application, including a 6-band parametric EQ, classic mastering stereo tube compressor/leveler, and a multiband master stereo limiter. All processing is modeled on classic analog gear and is 24-bit, floating-point. T-RackS features an easy-to-use, analog-style interface. Retail: \$299.

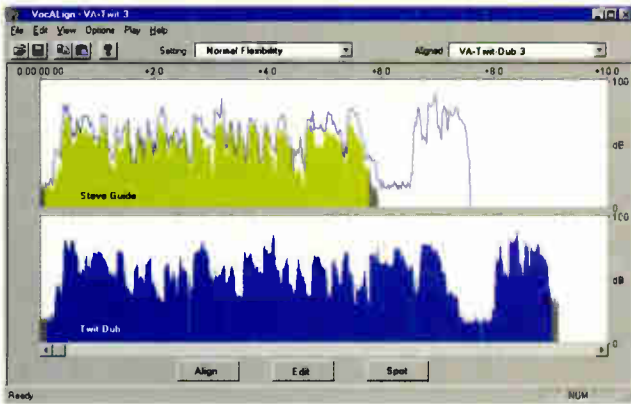
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## SADIE VOCALIGN PLUG-IN

SADiE ([www.sadie.com](http://www.sadie.com)) introduces the VocAlign plug-







in designed by Synchro Arts for use with the SADiE V3.7 digital audio editor (the free V3.7 upgrade features Macintosh disk support, direct import into AudioFile, Version 2.0 DDP and real-time CD-R burn). VocAlign automatically synchronizes two audio signals, speeding double-tracking and dialog replacement. Using SADiE's Region Editing facility, a user simply selects the Guide and Dub signals, and SADiE automatically puts the two in sync. Price: \$999. Circle 345 on Product Info Card

#### SEER SYSTEMS SURREAL

Seer Systems' ([www.seer-systems.com](http://www.seer-systems.com)) SurReal sampling/synthesis software for Pentium-based PCs combines up to five types of software-based synthesis—sampling, FM, physical modeling, analog and modal—and up to 64 notes from 16 channels can be played simultaneously. A simple front panel configures 16 channels for volume, panning, reverb and delay. Each channel also includes solo and mute functions and a "vari" parameter edit feature to vary textures and tonality for each voice. SurReal loads and plays standard MIDI file sequences and can convert

General MIDI files to Seer-Music files for playback on the Internet. SurReal works with most major sound cards and retails at \$129.

Circle 346 on Product Info Card

#### GUILLEMOT MAXI STUDIO ISIS PCI CARD

Guillemot's ([www.guillemot.com](http://www.guillemot.com)) Maxi Studio Isis (\$399.99) is a full-duplex PCI sound card and audio interface package for the PC that records up to eight channels and plays back up to four channels of 20-bit digital audio simultaneously at sample rates of 32, 44.1 and 48 kHz. Isis includes a 64-note polyphonic, General MIDI GS-compatible software synth and sampler with two LFOs, three envelopes, an adjustable resonant filter and 4 MB of samples; sample memory is expandable to 36 MB. Bundled software includes Logic Audio Pro Isis, Cool Edit Pro SE and Acid DJ. A rack-mount breakout box has eight analog inputs and four outputs (all unbalanced, 1/4-inch line-level) and optical and co-ax S/PDIF I/O. The card has a game port/MIDI port, stereo line-level input and output on 1/4-inch TRS connectors, and 1/8-inch mic input.

Circle 347 on Product Info Card

## UPGRADES AND UPDATES

Digidesign's SampleCell II Plus cross-platform PCI sampling card features 32 MB of RAM. Also new from Digidesign, the DigiDrive, a 10,000 rpm, 9GB drive optimized for Pro Tools. Get more information at [www.digidesign.com](http://www.digidesign.com). AlterMedia's Version 4.0 Studio Suite studio management software features a streamlined booking billing process, enhanced calendar module and much more. Visit [www.studiosuite.com](http://www.studiosuite.com). DARTECH's DART PRO 98 is the latest version of its professional audio restoration and recording application. Check out [www.dartech.com](http://www.dartech.com). M2X (Minnetonka Master Exchange) software from Minnetonka allows 5.1 surround masters to be exchanged between computers, even between Macs and PCs. Also new from Minnetonka, Fast EdEdit has been rewritten to be a full 32-bit Windows application. Visit [www.minnetonkaaudio.com](http://www.minnetonkaaudio.com). Event Electronics announces Version 5.5 of the DSP•FX Virtual Pack suite of real-time DirectX plug-ins. Now included is the StudioVerb plug-in. Also from Event, the DSP•FX Optimizer plug-in. Go to [www.event1.com](http://www.event1.com). Line 6's Amp Farm Version 1.5 features Pro Tools 2.4 MIX compatibility, plus five new models based on Mesa Boogie, Soldano and Matchless guitar amps. Visit [www.digidesign.com](http://www.digidesign.com). Seer Systems is supporting the Be Operating System; visit [www.seersystems.com](http://www.seersystems.com). Steinberg announces the release of ProSoniq's sonic-

WORX V.2.0 audio software for the Mac. Also from Steinberg, Studio LIVE from Mix-Man Technologies. Visit [www.steinberg.de](http://www.steinberg.de). Aureal Semiconductor announces the Web availability of its A3D Pro sound design plugin for Pro Tools. Check it out at [www.a3d.com/a3dpro](http://www.a3d.com/a3dpro). The EZQuest King Boa is a standalone CD-R/W duplication system that writes up to 14 drives simultaneously. Visit [www.ezq.com](http://www.ezq.com). Rocket Network ([www.rocketnetwork.com](http://www.rocketnetwork.com)), a division of Res Rocket Inc., will include the Q-Design ([www.qdesign.com](http://www.qdesign.com)) music codec in RocketControl 2 software. Portions of Arboretum's Ray Gun and Hyperprism technologies will be incorporated into Adaptec's CD recording packages; visit [www.arboretum.com](http://www.arboretum.com) or [www.adaptec.com](http://www.adaptec.com). Zapex Technologies offers Dolby-certified single PCI boards for stereo and 5.1-channel audio encoding. Visit [www.zapex.com](http://www.zapex.com). E-mu Systems ([www.emu.com](http://www.emu.com)) lowered the price of Orbitt V.2 and Planet Phatt sound modules, to \$795 each. CD Cyclone introduces the One-2-One CD-ROM-to-CD-Recorder, a standalone unit featuring 4x speed, SCSI ports and one-button operation. Check out [www.cdyclone.com](http://www.cdyclone.com). HHB's new CDR74 silver disc CD-R media is said to increase reflection ratio to greater than 74%. Check out [www.hhb.co.uk](http://www.hhb.co.uk). Marcan's Discmatic Opal7 CD-R printer (\$1,995) features 1,200 dpi resolution; drop by [www.marcan.com](http://www.marcan.com) for details. ■

# MACKIE PRO TOURING SPEAKERS

*THE MIXER COMPANY GETS SERIOUS ABOUT SOUND REINFORCEMENT*

One year ago, Mackie was completing its plans to acquire RCF, a major OEM supplier of speakers, horns and drivers to manufacturers and touring companies worldwide. Based in the Northern Italian city of Reggio Emilia, RCF has, over the past half-century, established itself as a leader in transducer technology and is a well-known player in the European contractor market. From both sides, the partnership made sense: RCF wanted to increase its investment capital and Mackie needed a high-technology ally for its entry into the sound reinforcement market.

Concurrently with the RCF acquisition, Mackie acquired Fussion Audio, a California-based designer of high-performance touring installation systems. Fussion uses RCF components and is run by former RCF North America marketing VP Marcelo Vercelli. During this time, Vercelli met RCF's principal system and transducer engineer, George Krampera, a Czech designer who had previously worked on successful products such as Yorkville's Elite line, and RCF's Art Series and woofer products.

Krampera's strength is finding simple answers to complex problems, such as hum in live performance. "Lifting the ground to cure hum is a major problem," says Krampera. "One solution I've used in Czechoslovakia since 1975 is to place a diode across the ground lift switch. The diodes are conductive above 15 volts, and up to that level, the ground floats. It's an easy, low-cost solution, but the difficulty is getting CE and UL approval."

Krampera and Vercelli's collaboration led to the Fussion 3000, an active, three-way full-range system with onboard 1,500-, 300- and 150-watt amps feeding four 12-inch woofers; a horn-loaded, 8-inch cone midrange with phase plug; and a 1-inch HF driver on a wide dispersion horn. A matching double-18, 3,000-watt subwoofer is optional. According to Krampera, one of the secrets behind the 3000's ultralow-distortion performance—said to be in the 0.05% range at full rated power—is the "near-ideal relationships you can create between speakers, electronics and horn designs.

"We've been working on the intermodulation distortion problem," Krampera explains. "Air above 140 dB is nonlinear, and low compression-ratio horns reduce the pressure on the cone for lower distortion and better

intelligibility, even at longer distances." Krampera points out that most long-throw designs create distortion within the horn, and that same distortion is what the audience in the back row will hear. "Our approach works up to 50 yards away, for up to 5,000 people, and we're researching a new design that works beyond 100 yards. In addition to horn geometry, our IMD solution involves the amplifier design, using Trans-FET amps for the mids and lows, and low-distortion, double voice coil midrange speakers."

Another Krampera method of reducing distortion is the creation of a near-zero-inductance woofer, using a second winding on the pole piece opposite the voice coil, resulting in a purely resistive driver with distortion around 0.01%—about ten times lower than conventional designs.

The onboard amplification driving the Fussion 3000 is a compact, high-efficiency design that derives 1,500 watts (into 2 ohms) from 22 output devices mounted on a chassis about the size of a piece of paper. However, beyond merely mounting amps inside speakers, the Mackie design approach is to build active, powered systems under electronic control. It's all a matter of physics and efficiency, according to Vercelli. "What's easy to do electronically is often difficult to do with acoustics, and what's easy to do acoustically can sometimes be difficult to do with electronics," he says. "Our ultimate goal is to incorporate the technology we

developed for our Digital 8-Bus console into DSP control systems for speakers."

A recent example of that philosophy is the MAS 1530 Mackie Active Stage System, a three-way, tri-amplified (300 + 100 + 100-watt) speaker with onboard time correction, phase alignment and EQ. Combined with the SRS 1500a active 15-inch/600-watt sub, the MAS 1530 offers a 1,100-watt system retailing for \$1,400. Also recently introduced is Mackie's SRM 450 C300 line of composite-molded, active speakers. (The ultra-lightweight designs and "Darth Vader" appearance made a major splash but may have overshadowed Mackie's entry into the high-end system market.) A low-profile, wide-dispersion, powered 250-watt slant monitor is also in the works. All in all, an impressive start for a division that's less than a year old.

Mackie Designs Inc., 16220 Wood-Red Rd. NE, Woodinville, WA 98072; 425/487-4333; Web site: [www.mackie.com](http://www.mackie.com). ■



*Mackie's Fussion 3000 is a 1,950-watt, three-way box.*

**BY GEORGE PETERSEN**



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World Radio History

# SOUNDTRACS DPC-II

## LARGE-FORMAT DIGITAL MIXING CONSOLE

Of all the incredible advances currently occurring in digital audio, perhaps the most impressive of all is in the area of digital mixers. The advent of low-cost digital mixers such as those from Yamaha, Panasonic, Mackie and others is the most visible, but, with the Soundtracs DPC-II, the high end is showing the signs, too.

Long a manufacturer of analog mixers, such as the Solo line and

handling 160 inputs and 40 outputs; a DPC-II with a single fader bank and a master section has the same functionality as one with 96 faders. The DPC-II I evaluated at Sound Lounge in Manhattan was a 24-channel (48-fader) surface.

Each strip of an 8-channel bank has two motorized 100mm faders for the channel and monitor signal paths; each fader is accompanied by solo, mute, and automation

Each fader bank also has a TFT (Thin Film Transistor) touchscreen display, in which channel settings are edited, surrounded on three sides by rotary pots and switches, some of which change function depending on the display; others are dedicated to EQ and dynamics control. A joystick for surround panning fills out the hardware in each bank.

There are several ways to switch the display and the shared controls between layers, including using a hardware View toggle button located between the two fader sections, a section of the touchscreen or by simply touching the desired fader.

The master section includes two TFT displays: The upper is flanked by several rows of buttons above and below it, and the lower is abutted by standard master section controls, for monitoring, machine control, etc. The upper display is primarily used for system configuration, while the lower is for bus and output routing, as well as for duplicating the display of the selected channel. The ability to bring the channel display and controls within arm's reach reduces the number of times it is necessary to leave the sweet spot to make an adjustment. Curiously, the knobs for the dynamics features are not duplicated in the master section, although the EQ knobs are; an unfortunate choice. At the bottom of the module are eight submaster faders, the master fader, rotary wheel and trackball. A slide-out drawer just below the console surface holds a QWERTY keyboard.

All of the DPC-II's processing is contained within the control surface chassis (as opposed to being contained in rack modules), so there are quite a few connections on the back panel, including four pairs of MADI I/O on BNC connectors, which connect to the I/O modules; word clock in and out (BNC); AES/EBU and S/PDIF inputs for clocking only (no data is recog-



the more recent Topaz, Soundtracs entered the digital market with 1997's introduction of its Virtua console. Now, the DPC-II shows Soundtracs moving upscale for the second round, from Virtua's mid-size profile and five-figure price up to the six-figure, large-format range of the DPC-II. The DPC-II's \$200,000 price range is much less than most other all-digital large-format solutions. What do you give up for the price? Not as much as one would think; high performance/high value is the key to the DPC-II.

### FEATURES AND FUNCTIONS

The DPC-II is available with control surface configurations of 16 to 96 faders, in eight in-line channel increments (i.e., 16 faders on eight channel strips in each bank), but any configuration is capable of

record/play buttons and indicators, and an eight-character "soft" scribble strip. Channel names can be any length, but the scribble strips show only the first eight characters.

The two fader sections in each channel are treated in the software as Upper and Lower layers, with 80 inputs on each layer. The 96-channel surface offers 48 faders per layer, so accessing the rest of the channels in an 80-input layer is accomplished by shifting banks horizontally with Left/Right scroll buttons in the Master section. These buttons not only grant access to all of the channels in a layer, but also allow any bank to be brought adjacent to the master section for convenience. On the DPC-II, the scroll buttons see constant use.

BY LARRY THE O





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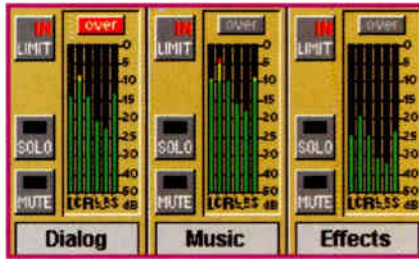
nized at these inputs); SMPTE in and out (XLR); MIDI In, Out and Thru; video sync in; and RS-422 (for Sony 9-pin communications). Finally, there are connectors for the internal PC part of the DPC-II, including a modem ("so DPC-II can phone home" as Soundtracs jauntily describes it) and an SVGA echo of the upper master display. And, in spite of the pricing, there are useful "mint on the pillow" perks such as 75-ohm termination switches for the video sync and word clock inputs, and level controls on the SMPTE input and output.

### ROUTING, BUSING AND DSP

I/O to and from the DPC-II is handled by a selection of outboard rackmount modules: analog, AES/EBU, TDIF, ADAT Optical or MADI. The analog, ADAT and TDIF cards each offer eight channels of input and output, while there are three AES/EBU cards available: eight channels of input with sample rate conversion on each input, eight channels of output with no SRC, and a card with eight channels each of input and output, with SRC on all.

DPC-II operation focuses around the

fader section controls and the touchscreen, although the trackball becomes necessary for a great deal of the automation work. I find well-implemented touch-sensitive control to be an extremely intuitive and efficient way to work, and the DPC-II's control scheme with its touchscreens and the touch-



*This control screen provides simultaneous level merging and solo/mute/limiter switching for three 5.1 stems.*

sensitive faders succeeds admirably in circumventing, or at least mitigating, much of the mental work involved in using assignable consoles.

Once inside the console, input signals are routed to channels and fader sections with the channel touchscreen, using a destination-based logic that rather than directing an input to a chan-

nel, asks the user to select the channel and choose an input for it. Inputs are grouped into named categories (e.g., "Mic In 9-16," "Digital FX," etc.). It takes four touches to assign an input to a fader section. In addition to console inputs, buses can also be selected to feed fader sections. Output assignment is similar: Select the destination, then choose the source that will feed it. Outputs include the main outs or buses.

This brings us to one cost-saving characteristic: The 160x40 configuration includes all inputs and outputs. There are no additional aux sends or returns, group outputs or even monitor outputs; all inputs and outputs are drawn from the same pool. This engenders a lot of flexibility to apportion resources according to individual needs or working style, but, in some applications, can result in extra resources being burned. For example, the group buses have limiters on them, but no EQ or flexible dynamics. If you subgroup a number of inputs and then want to EQ or compress the group, you must bring the group back into channels (which do have those features). In this case, both buses and channels are being burned for the group, in addition to the chan-

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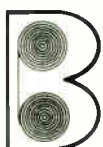
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## FIELD TEST

nels used for the member inputs. If you're someone who does a lot of sub-grouping, you'd better do the math.

Another consideration is how quickly outputs are consumed when working in surround. For a 5.1 mix, you'll want your Main output to be 5.1, at least two or three buses that are 5.1, and likely solo-in-place, which requires the same number of outputs as the Main. With three 5.1 buses, that's 30 out of the total pool of 40 outputs, not even including aux sends.

Each fader section in a strip features four bands of EQ plus highpass and lowpass filters, dynamics and a digital insert point. The DPC-II offers useful flexibility in the EQ: The highest and lowest EQ bands can be shelving, high-pass, lowpass or peaking, and all bands offer full 20 to 20k Hz sweep range. The EQ display shows each band, color-coded to the hardware knobs that adjust the band. No slacking in the dynamics section, either: There are four different compressor/gate configurations, three of which incorporate the highpass and lowpass filters for the channel, remov-

ing them from the EQ section. The compressor has a variable soft knee action, meaning the higher the compression ratio, the harder the knee.

The latter capability not only makes frequency-sensitive dynamics (such as de-essing) possible, but two of the configurations put the filters in the dynamics signal path for frequency-selective dynamics (i.e., band compression). The selected band is filtered out of the signal, dynamically modified and recombined with the rest of the signal. EQ settings can be stored as presets, as can dynamics settings. I found the EQ and, especially, the dynamics section to be outstanding examples of the DPC-II's value for the dollar; features like this are powerful at any price.

Analog input modules provide a post-preamp/pre-A/D insert point, which shows up in the channel display when an analog input has been mapped to the channel. Mic preamp gain is controlled remotely from the console surface.

All parameters of a channel except routing can be stored as a Channel preset. All parameters currently on the mixer can be stored as a snapshot, and the current

## SOUNDTRACS DS-3 DIGITAL CONSOLE

Unveiled in prototype form at last month's NAB show in Las Vegas, the DS-3 is a new digital console based on the Soundtracs DPC-II architecture, but in a smaller-footprint version designed for medium-sized post facilities and "second" rooms in larger studios. Some details will change before the final release, but as shown, the DS-3 is available in a 48x32 (analog I/O) configuration, with 24 digital I/Os for inputs and buses in AES/EBU format.

Standard amenities include 5.1 surround panning and a 32x8 matrix providing routing of any combination of channels or stems to the buses for flexible monitoring. Supported control protocols include Sony 9-pin, MIDI and all frame rates of SMPTE timecode. Other features include 6-band EQ, compressors and gates on all channels, and 30-segment LED metering. All communication from the controller surface to the I/O racks is via MADI, while all the console DSP circuitry is located close, yet out of the way, within the console stand. The interface follows the DPC-II model—although slightly scaled down—with three high-resolution touchscreens, 24 moving faders and total dynamic automation of all console functions. The DS-3 is slated for a mid-late summer release. —George Petersen



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**FIELD TEST**

configuration (bus structure, monitoring setup, etc.) is stored as a Console preset.

A channel can be routed to buses or directly to any output socket. There are two kinds of buses: aux and group. Aux buses, when selected, use some of the assignable knobs beneath the display, while group buses use the submaster faders and, as mentioned, have a limiter available.

Fader groups ("control groups" in Soundtracs parlance) can also be designated. The submaster faders are used for the fader group masters when the Control Groups page is active. Control groups are created by making the page active, touching an onscreen button to activate a Control Group, then simply touching the faders that you want to add or remove from the group. Fast, simple, intuitive.

Currently, there is no true stereo linking in the DPC-II; no way to set two (or more) channels such that changing the settings on one—EQ, for example—changes the others. Soundtracs says stereo linking will be offered in an upcoming software version.

**THE MONITOR MATRIX**

The DPC-II's Monitor Matrix system is intriguing and powerful. The first step is to configure sources and map them to the eight Control Room Source buttons. Sources are created according to their monitoring scheme (i.e., mono, stereo, LCRS, 5.1 or 7.1). A signal source is then mapped to each leg of that scheme. For instance, to create a source called "Main Surround," you'd start by making a new 5.1 source and naming it. Moving to the Edit Sources display, you'll find a column with buttons for the legs in the configuration (L, C, R, SL, SR, Sub). Click on one of these buttons, say C, to select it, then select a signal to map to it. Moving farther to the right is a matrix in which you can set the routing for this bus in any monitor configuration. In our example, we would likely route C to the center channel in any surround configuration, to L and R in stereo, and to L for mono.

Once the control room sources are set up, the three Output switches must be defined. Rather than simply being three different speaker switches, the Output switches are complete monitoring configurations, including the ability to have a calibrated output level and to toggle sources on/off when selected. Similar to the sources, an output is defined by its monitoring scheme, then each leg is assigned to a speaker out-

—CONTINUED ON PAGE 231



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# ASHLY PROTEA

## 24-BIT DIGITAL EQ



The Ashly Protea 4.24G is a rackmount digital equalizer featuring four independent channels of  $\frac{1}{3}$ -octave graphic equalization, plus high and low-pass filters, full-featured limiters and delays on each channel. Its 28  $\frac{1}{3}$ -octave filters are on ISO frequencies from 31 to 16k Hz, allowing 15 dB of cut or boost, with a Q of 3.2. The filters' behavior and interaction are similar to the analog filters in Ashly's successful GXQ equalizers, from which they were mapped. In addition, the Ashly uses 24-bit, 48kHz delta-sigma A/D converters with 64x oversampling, and at its heart is the 80MHz Motorola DSP56303 processor.

The Protea 4.24G is smartly packaged in a two-rackspace chassis that is less than nine inches deep. (Rear connections include balanced XLR and TRS inputs and outputs.) The front panel features a brightly backlit LCD screen, surrounded by an arrangement of keyboard-style controls: Below the display are 28 pairs of keys for cutting or boosting individual EQ filters; these are also used for adjusting the parameters of the other functions. (For example, pressing both keys associated with a frequency flattens that filter.) As adjustments are made, a corresponding picture of a fader on the display moves up or down.

To the left of the display screen, menu keys page through each channel's four audio functions, and they provide access to a second

page of global parameters that address metering, MIDI, security and user preferences. There are three levels of password-protected security: All Access, Presets Locked and Full Lockout. The metering screen shows the input and output levels of all four channels in dBu. Each channel also has a front-panel bi-color LED to indicate signal at 0 dBu and clipping at +19 dBu. Another LED shows whether that channel is muted, and a third LED on the other side of the channel select indicates the channel being operated. Four Bank keys are used when multiple Protea units are chained together in larger systems, allowing up to 16 channels to be controlled from a master unit or from the remote.

Each of the Protea's four audio functions can be bypassed individually. The high and lowpass filters are 24 dB per octave, affording a high degree of roll-off and allowing them to serve as crossovers in special situations. The limiter has adjustments for threshold, ratio, attack and release; metering of gain reduction and output level is shown in the display. The delay is adjustable in increments as small as .02 millisecond, with up to 341 milliseconds available, also given in feet and meters. In addition to the obvious applications aligning FOH delay and zone speakers, this delay could also be used to syn-

chronize the arrival from floor monitors with that of the sidefills or even the side lobes of the mains. Though not all the Protea's audio functions are needed all the time, having them available may occasionally eliminate the need for additional processing and afford additional refinements.

The 4.24RD Remote is nearly identical to the front panel interface and duplicates most of its controls. It communicates using MIDI over a pair of XLR cables and, like the main unit, can control up to 16 channels of processing. It gets its power through the XLR cables, which can run up to 1,000 feet long. I used a 6-conductor shielded Protea cable from Rapco; it travels across the stage and coils better than two mic cables taped together. Because the Protea communicates using the MIDI spec and has MIDI connectors, it can also be controlled using third-party devices; the parameters are available on continuous controllers 1 to 40.

The Protea processors can also be controlled from a PC with Windows95 software that is supplied or can be downloaded from the Ashly Web site ([www.ashly.com](http://www.ashly.com)) for free. Using RS-232, the computer communicates from a serial port to a 9-pin D-connector on the Protea's rear panel, over a cable that can be up to 50 feet long. Settings can be edited offline, archived on the PC and printed out. Ashly offers two other Protea products—slave units, either 2 or 4 channels

BY MARK FRINK



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(the 2.24GS and the 4.24GS, respectively)—that have the same DSP functionality without front-panel controls and can be controlled from a main unit, the remote or a computer. They provide an economical alternative for building larger multi-unit systems or for installers who don't want to give full control to operators.

The Protea has 128 presets that can be given names up to ten characters long. Each contains the settings of all four audio functions for a single channel. The Protea also has 50 scenes,

with each scene assigning a preset to each of up to 16 channels; a library of presets designed for specific combinations of vocal mics and wedges can allow a monitor engineer to get a rig up and running quickly. I kept these monitor presets in the 30s and 40s locations. The Protea is also useful for FOH applications, so another library for main speakers in locations 50 to 69 was useful. Because there are application overlaps between FOH and monitors for delay speakers and sidefills, having presets for all of a company's inventory in memory is beneficial. Settings for the P.A. in specific rooms

could be kept higher up, in 70 to 100. Locations 101 to 116 were used for specific monitor layouts, allowing presets to be called up, customized and named for individual bandmembers' mixes. Thus, a scene built from these working settings would immediately recall a snapshot of the stage's EQ. Presets 121 to 128 or 1 to 16 could be used for the support acts and written to other scenes.

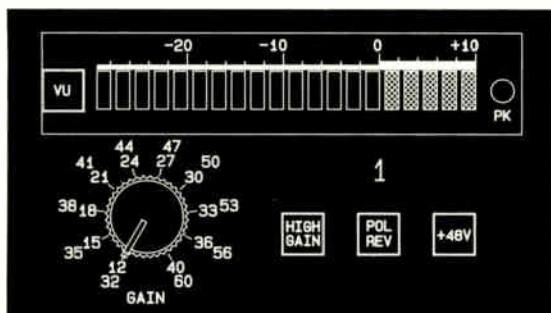
Operating the buttons while watching the screen took a little getting used to, but having the remote's interface identical to the main unit shortened the learning curve. While it's not quite as well as the expensive remote fader heads that other manufacturers offer, for the price of a fancy moving-fader remote you can now buy this entire programmable EQ system. There's nothing like standing at the mix, talking into the mic and making the adjustments right there. The ability to save all the settings and then turn it over to another engineer is also priceless. And how many times have you been shortchanged on time to properly EQ because of circumstances beyond your control? The benefit of being able to call up an EQ preset confidently is that less barking "one, two, one, two" is required, and you can quickly move on to the next item on the agenda. Did I mention that you can copy the settings of one channel to another with a couple of key strokes?

With the pro net price of the 4.24G at \$2,000 and the 4.24GS slave at \$1,400, it can be cheaper to put together a Protea system than using Ashly's GQX analog graphics, and it takes up only a third of the rackspace. A 2-channel system can be created by combining the 2.24GS slave (\$950) and the remote (\$850), with the remote sliding into a single-space shelf and both units taking up two spaces.

As a system, the Protea offers an affordable, flexible platform solution for a wide range of applications (from installations to touring to one-offs) and can be tailored to the needs of individual users while adding convenience and expertise. The only problem may be having enough inventory so that engineers won't fight over them. For those who favor parametric EQs over graphics, the folks at Ashly are working on other products, as well.

Ashly Audio Inc., 847 Holt Road, Webster, NY 14580; 716/872-0010; fax 716/872-0739. Web site: [www.ashly.com](http://www.ashly.com).

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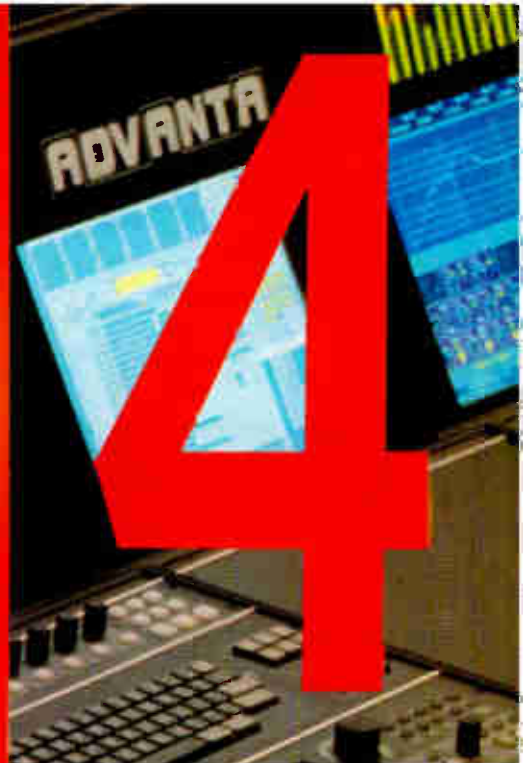
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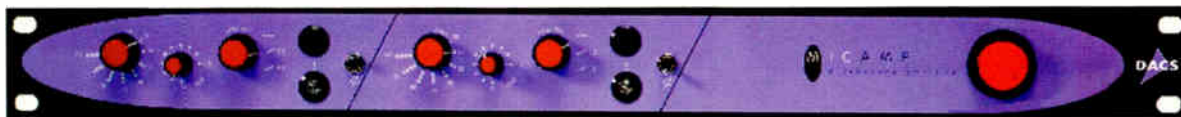
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# DACS MICAMP

## MICROPHONE PREAMPLIFIER



The exhibit floor of an AES show is hardly the place to judge the quality of a mic preamp, but Lew Frisch of Comprehensive Technical Group (CTG) of Atlanta did just that at AES last year. Standing at the DACS booth, Frisch was attempting to listen to the coloration of this new mic preamp when he heard something else. What was that? Then he realized that he was mindlessly fumbling with change in his pocket—the DACS MicAmp was picking it up through the mic at a distance of 15 feet, cutting clearly through the noise of the show floor. Frisch asked that a unit be sent to him as soon as possible. Two months later I had a session coming up with Bill Shafton, a wonderful acoustic jazz guitarist from Los Angeles, and asked Frisch for recommendations on mic preamps for the session. He insisted I try the DACS MicAmp, along with a Grace Designs 201.

Founded ten years ago in Newcastle, England, by Dr. Douglas Doherty, DACS (Digital Audio & Computer Systems) was established to build custom audio electronics. One of DACS' "standard" (non-custom) products, the MicAmp is a 2-channel, ultra-low-noise design, based on discrete components.

The face of the unit's single-rack-space chassis is purple and features three red knobs for each channel's controls. This mic pre does not get lost in a rack of gear! Gain is set in seven 6dB steps from +20 dB to +62 dB, and a 0-10 dB trim control with a 21-mark scale provides for accurate

repeatability.

Other features include a gentle two-stage bass roll-off filter and tri-segment LED meters with a bright overload LED that stays on for a few seconds after overload occurs. There's also a phase reverse toggle switch for each channel. The rear panel has a set of XLR inputs for phantom power and another pair of XLR inputs for non-phantom power requirements, as well as XLR outputs.

**British manufacturer  
Digital Audio &  
Computer Systems  
debut a new  
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noise mic preamp.**

Shafton and I had five days to record and mix five songs for his upcoming CD and spent the best part of the first day finding the right mics (Neumann TLM 103 & KM184, with a Groove Tubes MD3a and EquiTech E200) and testing mic pre's. Along with the Grace 201, a favorite among many acoustic artists, and the new DACS, my studio has a pair of Neve 1272s and API 312s reworked by Brent Averill, and a D.W. Fearn tube mic pre. Each

preamp had its own color and flattered the acoustic guitar, and each was exceptional with its own texture, except for the DACS: When using the DACS, it sounded as if a cover had been taken off the microphones. Thankfully, we were rolling tape during the tests and could go back and recheck our immediate reactions—there was still no doubt about it.

Transparency is a word used often to describe some higher-end mic preamps, and the DACS has exactly that: No color, no enhancement, just the pure, clear sound of the instrument. When listening to the tape, each mic pre was clearly different in its tone, but you didn't have to have golden ears to be startled by the clarity of the DACS MicAmp. At a retail price of \$2,150 for two channels, it's not for the budget studio but is certainly priced in line with other high-end mic preamps. I plan to add one to my studio rack soon.

Not one to be overly impressed by specs, I rely on my ears when evaluating a mic pre. That said, the specs *are* very remarkable for this unit (check out the DACS Web site for more info), and the sound is absolutely clear and faithful. Highly recommended.

DACS is distributed in the U.S. by Independent Audio, 43 Deerfield Road, Portland, ME 04101; 207/773-2424; fax 207/773-2422. Web site: [www.dacs-audio.co.uk](http://www.dacs-audio.co.uk). ■

*Elliott James owns Wateree Studio in Atlanta. Visit him at [www.elliott-james.com/wateree.htm](http://www.elliott-james.com/wateree.htm).*

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# SUNDHOLM SL6.5W AND SL10/s

## STUDIO MONITORS WITH STEREO SUBWOOFERS

Although Sundholm may not be a familiar name in pro audio, Conrad Sundholm, the company's president/chief designer is hardly a newcomer to the industry. He founded Sunn Musical Equipment in the mid-1960s and later started Biamp Systems. Several years ago, Conrad's son began a recording studio and asked his father to help him pick out some studio monitors. They auditioned a



wide variety of market offerings, and, disappointed in what they heard, Conrad took on the task of designing a pair of affordable, yet high-quality, studio monitors. The SL6.5w and SL10/s are the result.

The system is based around the SL6.5w, a two-way, full-range monitor with a 6.5-inch polypropylene cone LF/MF driver and a 1-inch dome tweeter set back into a conical waveguide. The latter provides wide dispersion with the added benefit of placing the voice coils of the two drivers into acoustical alignment. The 25-pound, 15.5x10.5x11.5-inch cabinet is front-ported, and the drivers are arranged in mirror-imaged pairs. Retail is \$795/pair.

Complementing the SL6.5w monitors is a pair of SL10/s subwoofers, each featuring a front-firing 10-inch LF driver in a

BY GEORGE PETERSEN

## Lab Analysis: Sundholm Acoustics SL6.5w Monitors

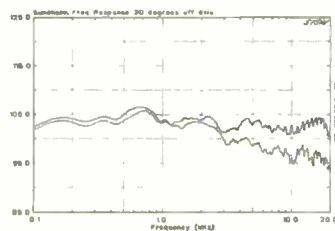
by John Schaffer and Rob Baum

### PHYSICAL CHARACTERISTICS

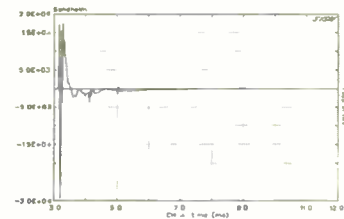
The Sundholm SL6.5w cabinet is a bass-reflex design with a flared 2-inch diameter port on the baffle. The cabinet is constructed of ¾-inch-thick MDF with a speckled granite paint finish. The woofer is recessed and flush-mounted onto the baffle with t-nuts. The tweeter is recessed one inch into the baffle, secured by wood screws and topped off by an MDF waveguide, which acoustically aligns the two drivers. There is an MDF cross-brace inside the cabinet, between the woofer and tweeter. Fiberglass insulation is on five of the six internal surfaces, but not completely covering each surface (which may explain the minor spikes in the tail end of the time response at approximately 4.2 and 5.1 milliseconds on the impulse response graph; see below).

The 6½-inch woofer appears to be sourced from Vifa. It includes a 1¼-inch-diameter voice coil. The formed curvilinear polypropylene cone has a half-roll rubber surround, which is more environmentally stable than a typical paper cone with a foam surround, and is topped off with a soft rubber dust cap. The 3.5-inch-diameter flat spider is mounted to a

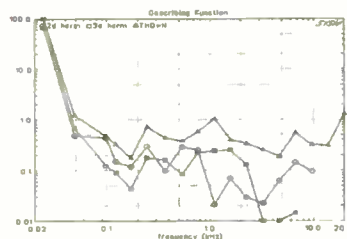
—CONTINUED ON PAGE 162



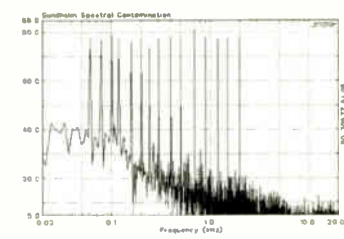
On-axis and 30-degree off-axis frequency response. Off-axis response smoother than on-axis.



Impulse response shows time coherence between woofer and tweeter, and a damped overall response.



Distortion vs. frequency: Distortion generally remains under 0.5%. THD+N =  $\Delta$  trace, 2nd harmonic =  $\circ$  trace, 3rd harmonic =  $\square$  trace.



Spectral contamination test compares a series of input tones (tall spikes) to speaker output. The resulting nonlinear distortion products show low self-noise (around 50 dB down).



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### FIELD TEST

32x11.5x15-inch (HxWxD) enclosure with dual front ports and an internal crossover for driving the system using a single stereo power amp. The passive subs are priced at \$1,295/pair. (Also available is the SL10/ps, the 200W powered version, retailing at \$1,795/pair.) It should be noted that the SL6.5w's are full-range monitors and can be used either alone or with the subs, allowing the owner to start out with the mains and add the subs as necessary.

The Sundholm system provides several nice touches. The subwoofers' 32-inch-high enclosures double as stands for the SL6.5w monitors, placing the acoustic center of the top cabinet at approximately 44 inches from the floor, a near-optimal height for seated listening in the near field. The subs include four padded feet for each SL6.5w, designed to acoustically decouple the top monitor from the sub. Each SL6.5w monitor also includes a soft, dense-foam plug that is inserted to block

the port when the monitor is used with the subwoofer. This allows the SL6.5w/SL10/s combination to do double duty, as an extended-range system in the studio, or used separately—perhaps with the top units filling in as a portable near-field set when the engineer travels to another studio.

The rear panels of all the speakers include recessed cups with gold-plated, five-way binding posts and large-diameter holes to accommodate (10/12 AWG) heavy gauge wire. And speaking of wire, the SL6.5w monitors are equipped with removable straps and an extra set of inputs to handle bi- or tri-wiring applications. Setup requires little more than connecting the subs to your power amp and the monitors to the subs. However, the speakers are not magnetically shielded and should be kept at least 15 to 18 inches away from computer and video displays. (Sundholm informs us that a shielded version of the SL6.5w will be available soon.)

The Sundholm monitors do require a

#### —FROM PAGE 160, LAB ANALYSIS: SUNDHOLM ACOUSTICS SL6.5w MONITORS

black, cast-aluminum frame, which in turn is secured onto a .22-inch-thick top plate. This unshielded design uses a 3.56-inch-diameter, .67-inch-thick ceramic magnet. Male terminals allow for both .205-inch and .110-inch connectors.

The Vifa tweeter has a 1-inch-diameter soft-dome diaphragm made from treated polyester cloth mounted onto a 4-inch-diameter plastic faceplate, which is covered by an MDF waveguide. The conventional motor structure (top plate, magnet, back plate/pole piece) is unshielded, but the pole piece is vented into a damped, sealed plastic enclosure to lower the tweeter's resonant frequency, as well as reduce reflections and cavity resonances. Terminations are dual male .110-inch connectors.

The crossover features two pairs of gold-plated, five-way binding posts with straps, allowing full-range or bi-amp operation. The binding posts are mounted onto a plastic terminal cup. Inside the enclosure, the crossover components are soldered point-to-point, arranged neatly onto a Masonite board.

#### ACOUSTICAL CHARACTERISTICS

This monitor possesses a fairly flat frequency response. Aside from a ½-octave-wide peak centered at 700 Hz, the frequency response varies only  $\pm 1.5$  dB from 100 to 20k Hz. During the last octave, 10 to 20 kHz, there appears to be some comb filtering, probably attributed to the minor discontinuities of the MDF waveguide and tweeter faceplate. The off-axis response is surprisingly smooth. From 700 to 20k Hz, the sensitivity rolls off 10 dB at a nearly constant slope.

The Sundholm's impulse response is fairly well-damped except for the two minor spikes spaced about 0.9 milliseconds apart, probably due to internal cabinet reflections. The woofer and tweeter appear to align in time due to the physical offset of the tweeter.

Due to the quality of the Vifa transducers, the distortion response is fairly low. The distortion measurement was taken around 85 dB and shows that the system maintains below 1%, with just a few data points over 0.5%. The spectral contamination reveals that the self-noise of the speaker is around 50 to 55 dB down from the input signal. ■

*John Schaffer and Rob Baum are test engineers with Menlo Scientific, an independent acoustic lab based in Berkeley, Calif. For more on testing methodology, visit [www.mixonline.com](http://www.mixonline.com).*



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**FIELD TEST**

fair amount of power (150 to 250 watts recommended), and while not overly sensitive to the amp used, will quickly spotlight the flaws in a low-quality amp. I began with the SL6.5w speakers alone, sans sub, powered by a Bryston 4B amp, which offered plenty of punch and ample headroom. Listening to a CD I produced of a brass quintet (plus trap drummer) playing 19th-century dance pieces, the quality of the Sundholm monitors was easily discernible, from the midrange smoothness of the trombone and French horn, the snap of the

trumpet and piccolo trumpet, to the crisp reproduction of the snare and cymbals. The low-end balance (in this case mostly tuba and double-headed kick drum) was even and right, extending well below 60 Hz. At no time were the highs shrill, overextended or brittle.

The tweeter waveguides create a fairly wide dispersion pattern with a comfortably wide sweet spot. The HF reproduction remains constant to about 20° off-axis, after which the top end rolls off sharply. The imaging was excellent, providing a clear impression of the soundstage, allowing the engineer to hear changes in stereo mic place-

ments and techniques clearly.

Attaching the optional subwoofers to the system opened up a new dimension, bring the LF response down to a thumping -3dB down point in the 38Hz range. The subs' cabinet volume is in excellent proportion to the 10-inch woofer's requirement, and placing the LF driver toward the top of the enclosure allows for proper coupling with the drivers in the top box, and helps prevent standing waves between the floor and the ceiling. And although bass energy tends to be nondirectional in nature, a dual subwoofer system goes a long way toward eliminating hot spots and providing even LF coverage, even in a smaller control room.

In studio sessions on rock, jazz and pop material, mixes made on the SL6.5w's monitors translated very well to playback on a variety of other speakers, ranging from top-end audiophile systems to cheap boom boxes, and just about everything in between.

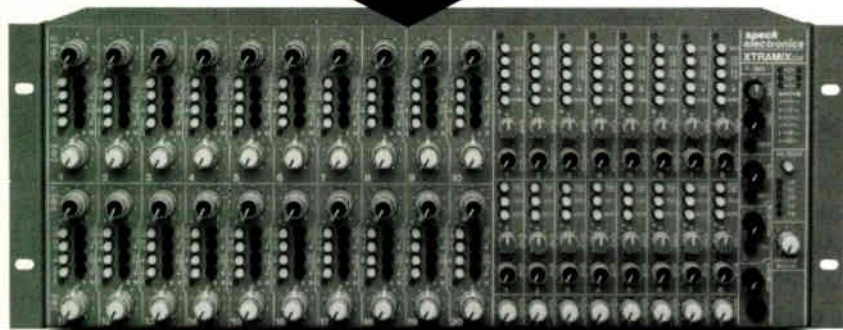
The response was natural and unhyped, which is a marked difference from many low-cost monitors that may add a couple "marketing" bumps to make them sound "better" in the extreme frequency ranges. Retailing at \$795/pair, the SL6.5w monitors are an excellent value; add in the subwoofers and you have a system that can hold its own against monitors costing much more. Anyone seeking a versatile monitor system with realistic reproduction should check these out.

Sundholm Acoustics, Box 68794, Milwaukee, OR 97268; 503/794-2661; fax 503/786-1550. Web site: www.sundholm\_acoustics.com. ■

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# CLM DYNAMICS EXPOUNDER

## STEREO DYNAMIC EQUALIZER

The Expounder, from Scottish company CLM Dynamics, is an analog stereo/dual mono 4-band parametric equalizer with stereo high/lowpass filters that expands the traditional role of EQ with a few clever and powerful twists. Housed in a sizable (three-rack-space) chassis, the Expounder may be intimidating at first glance, but is usable immediately after a quick read of its well-written manual.

The rear panel has balanced XLR I/Os with separate +4dBu or -10dBV

tracks from a multitrack master. As I suspected, a first-time user (such as myself) requires some necessary “fiddly” time with this deep and comprehensive equalizer.

Each channel of the stereo Expounder has a sweepable highpass (marked Lo-Cut) filter and a lowpass (labeled Hi-Cut) filter with either 12 or 24dB/octave roll-off. These are two single pole filters in series, placed in the feedback loop of a 2108 op-amp (from THAT Corporation), with each filter providing up to

high frequencies (tape or guitar amp hiss) the filter’s action is less noticeable, as the filter “opens and closes” predicated on level and takes advantage of the psychoacoustic masking effect (when a louder sound covers up a quieter sound at the same frequency).

Using this feature extensively for electric guitar amp noise and for stage floor rumble, I found that the filter shuts like a noise gate when there is no sound. In addition, the filters each have a switchable resonance control that introduces a resonant peak of up to 12 dB at the selected cut-off frequency. Resonance is usually only found on synth filters; perhaps it is a holdover here from Allan Bradford’s analog synthesizer designs. Including it here makes the Expounder a one-of-a-kind box. At maximum settings, the Res control stops just short of oscillation and adds a noticeable whistle to the filter’s action. The result is difficult to describe exactly, but it reminds me of a high-quality envelope filter that tracks perfectly. This effect works wonderfully on very dynamic individual tracks such as rhythm guitars, drum loops or more frequency-coherent noises such as percussion tracks, techno or industrial type sounds.



level switches. The front panel PPM responding LED meter has a peak holding circuit that indicates when output levels reach 0 dB or higher. With radical equalization, the unit’s internal headroom can be exceeded, and in such cases, each channel’s  $\pm 15$ dB input gain controls come in handy. Also, peak LEDs on each equalizer section illuminate when levels reach +12 dBu or 12 dBu below clipping—another useful touch, as CLM recommends driving the Expounder “fairly hot” to maximize performance and signal-to-noise ratio. In Bypass, the output LED’s read the input level (clever) and should normally peak around +4 to +6 dB.

A Master Enable switch is a non-hard-wired/non-relayed bypass switch. When switched to Bypass, the audio signal goes through the input unbalancing circuit (two op-amps) and then an output balancing circuit (two op-amps), so the Expounder must be powered on to pass audio.

### TRACKING FILTERS IN USE

For this review, I checked out the Expounder on pre-recorded mixes and on individually recorded

12 dB of attenuation. According to designer Allan Bradford, the phase shift is linear with frequency, and by the time the phase has shifted by 180°, the attenuation has reached 35 dB below passband, and consequently, the only thing affected is the steepness of the slope, and ultimately, the amount of out-of-band rejection. But whatever the reason, I found the high and lowpass filters to be smooth, non-ringy and surprisingly full range: The highpass goes from 15 to 16k Hz while the lowpass sweeps from 75 to 24k Hz. (Check these first if you have no sound coming through the unit!)

In Expounder’s Track mode, the filters dynamically follow the amplitude of the audio source. This tracking action has a fast attack and release nature—the better to exactly “trace” the amplitude shape of your audio source. Tracking makes it possible to use a higher frequency setting (in case of a highpass rumble filter) than you would with regular, fixed highpass filters. When rolling off low frequencies (such as air conditioning or traffic rumble) or

BY BARRY RUDOLPH



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dB—an enormous amount, so there is a “/3” button that divides the range by three (about  $\pm 6$  dB) for finer, more subtle control. The Dynamic switch expands the dynamic range of the frequencies selected in the LF section. Up to 5 dB of extra dynamic range is possible, with quick attack and release expansion. This effect only works for positive values or boosts of LF; I was hoping the effect could also be subtractive or inverted, so that a selected band of frequencies would be attenuated following the increased level. The Track-

ing mode will punch up any bass instrument or drum much differently than a regular equalizer: When I tried using only a slight boost, the Expounder emphasized the fundamental frequency of a bass guitar without woofing out the rest of the instrument's sound.

The LMF section covers from 200 to 2k Hz. In this section, a Variable Q control changes filter shape from 0.7 to 1.5, which is not high enough Q for certain tone sculpting. However, you can boost or cut  $\pm 15$  dB or use the “/3” button for a range of  $\pm 5$  dB. The Notch button changes the entire section into a notch filter with a maximum depth of -30 dB.

The Q in notch mode is not tight enough for removing very small bands of frequencies with surgical precision; however, I made good use of this section to rid hurtful frequencies from a guitar track.

The HMF section ranges from 1 to 8k Hz. Like the LMF section, all the same features are here and the two sections overlap well for good coverage of the middle frequencies. But I could see reasons for full overlap between the LMF and HMF sections (or two identical sections), and I wouldn't mind if one of these sections had the tracking/dynamic feature and a higher Q capability as well. Using the LMF and HMF sections together will give you the most options when bumping up or carving out important midrange sounds.

Like the LF section, the HF section has switchable bell/shelving, the same two bell shape choices and dynamic tracking. HF covers from 1.5k to 20k Hz. Dynamically tracking in the high frequencies increases detail, clarity and brightness. This is good for stereo mixes or for more attack on percussive instruments with loads of boost available if you need it.

#### DYNAMIC LINKING

The Expounder is stereo-linked by way of Dynamic linking. The link function works when the tracking mode on the highpass and lowpass filter sections are used in one or both channels. There are two linking buttons: Ch 1>2 means channel 1 modulates channel 2, Ch 2>1 means channel 2 mods ch 1, and if you push both buttons, the Expounder will sum Left + Right and subtract 3 dB and use that for the side-chain tracking control signal. This ability is important to prevent image shift when dynamically processing a stereo sound source. Another use for this feature is for a special effect where frequency and amplitude of one audio source (in channel 1) would modulate the spectral content of another audio source (in channel 2).

At \$3,300, the Expounder is a non-computer-based answer to more complex filtering and equalization needs. Whether used as a problem solver, special effect or dynamic enhancer, the unit is a fine addition to any studio's outboard rack.

CLM Dynamics, distributed by PMI Audio, 23772 Madison Street, Torrance, CA 90505; 310/373-9129; fax 310/373-4714. Web site: [www.pmiaudio.com](http://www.pmiaudio.com). ■

*Barry Rudolph is an L.A.-based recording engineer. Visit his Web site at: <http://home.att.net/~brudolph>.*

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# DBX DDP

## DIGITAL DYNAMICS PROCESSOR



The last couple of years have seen the birth of several cost-effective, all-in-one digital dynamics processors loaded to the gills with algorithms for tracking, mixing and remastering. dbx's DDP Digital Dynamics Processor breaks an astonishingly low price point (\$599, plus an extra \$199 for the digital I/O option), while boasting pro features such as balanced analog I/O, 24-bit converters and digital throughput with dithering. My aching Visa card begged me for further investigation.

### GETTING TO KNOW YOU

The 1U, rackmountable DDP offers a plethora of processing algorithms, including compression, limiting, expansion/gating, de-essing, and 3-band parametric EQ. Both dual-mono and stereo-linked operation are supported.

The rear panel offers both XLR and ¼-inch TRS connectors for balanced analog I/O. The digital I/O option adds both AES/EBU and S/PDIF I/O to the rear panel. But there are no word clock connections, so multitracking with more than one unit in the digital domain is not feasible. Analog and digital outputs are always hot, but you must switch between analog and digital inputs. MIDI In and Out/Thru connectors facilitate MIDI Program Changes, parameter control and bulk dumps/loads. The AC cord is detachable.

The front panel sports 16 buttons for accessing the different algorithm chains, parameters and utilities (plus a bypass button for the digital processing), and a data wheel for programming. A gener-

ously sized LCD screen shows a wealth of info, including the program number, chain configuration of processing blocks, parameter values, digital I/O and gain reduction metering, stereo link status, threshold indicators for each processor in the chain (nice!), and a graphical representation of your current dynamics or EQ setup.

Four wide-ranging analog I/O gain knobs accommodate both +4 and -10dB line levels without a sensitivity switch. As we'll soon see, this is not necessarily a good thing. The knobs are detented, allowing repeatable settings. The two eight-segment meters above the gain pots can be independently switched to show either analog input or output levels for each channel.

Digital input level (-12 to +12dB range) is set via the Utilities menu. There is no dedicated control over digital output levels. But, you get simultaneous temporary peak-hold and average metering in the digital domain. The sync source may be set for internal crystal, AES/EBU or S/PDIF, and the sampling frequency to either 48 or 44.1 kHz.

### I'M IN CHAINS

The learning curve for the DDP is much steeper than it needs to be, due to an applications-driven design philosophy geared toward semipro users. There are 50 factory programs, along with 50 RAM slots for user programs. A program consists of separate (or linked) left- and right-channel "setups" such as the factory Bright Snare and Low Strings that suggest pre-

determined EQ and dynamics settings for specific applications (as if that's possible). Many of these setups use the same algorithm chains and differ only in their parameter values. When you save a program, you're only storing the algorithm chain configuration and not any parameter values—you must also save a "setup" in order to store parameter values.

Thankfully, a default setup is provided for each and every chain configuration, for those who wish to start with parameter values set to zero. But professionals will cringe at the tedium of having to title and store the algorithm chain in addition to the parameter values for that chain, especially because you can't change the order of the processing blocks in the chain, so you're always naming essentially the same thing. And because our industry's convention (outside of MI products like synths) is to name only programs, there's a danger that confused users will not label each setup with a unique name and will unintentionally overwrite all parameter values for all other programs that share that setup name!

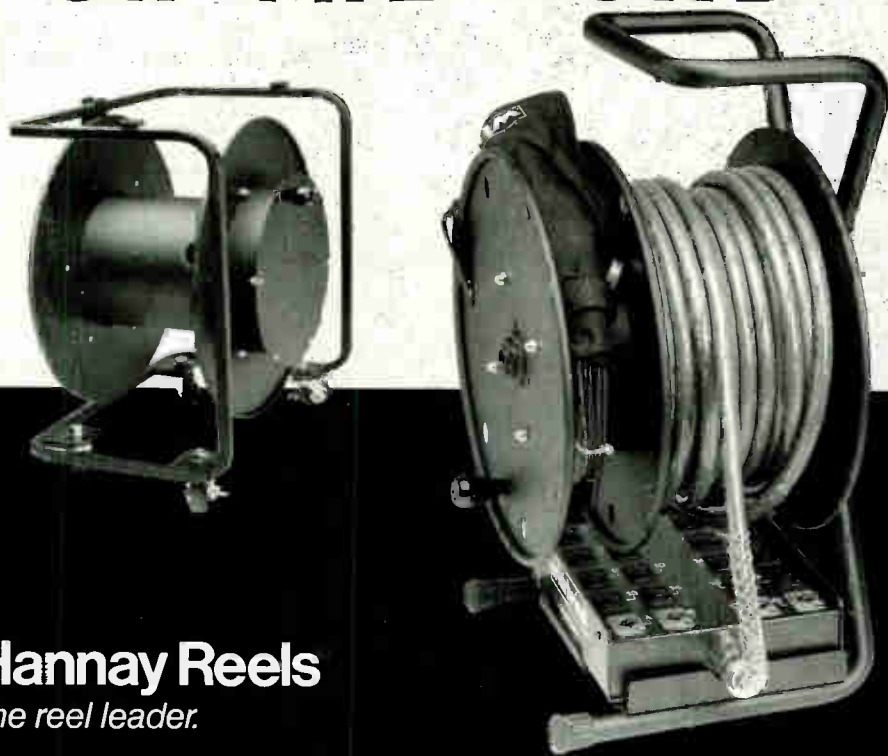
The algorithm chain order is: EQ, gate, compressor, de-esser, limiter. But some setups omit one block, and you can always turn off individual blocks in a chain. Version 1.3 software adds three algorithm chains that include dither, which you can set to 16-, 20- or 24-bit word lengths. The dither replaces the de-esser (so you can't use both simultaneously) but, of course, is placed at the end of the chain.

BY MICHAEL COOPER



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**ANALOG PUNCH**

The DDP places dbx's Type IV™ Conversion Process, which is essentially a soft clipper with noise-floor enhancements, before the A/D converters. Available only on the analog inputs, the clipper allows you to hit the DDP with a very hot signal without fear of generating digital "overs."

The clipper's threshold is set at 4 dB below the top of the A/D's input range. Unfortunately, you can't bypass the clipper and there is no makeup gain for the clipper itself, resulting in an output approximately 4 dB below full-scale. You must therefore increase the digital compressor section's output gain to bring your digital output up to 0 dBFS (a 1:1 ratio is offered if you don't want additional compression). But when using the unit's bypass button to do A/B comparisons, you lose the 4 dB of makeup gain, making comparisons difficult at best. A bypass provision for the Type IV clipper would solve this problem, but the extra analog circuitry required would raise the price of the DDP considerably.

On the positive side, the clipper sounds great on rock, country and blues, giving you a hotter, punchier sound. As one would expect, however, it's not appropriate to use on classical music, solo flute pieces and the like.

I also found the DDP's analog input sensitivity to be set too high for pro levels. You must attenuate pro levels approximately 8 to 12 dB to get internal digital input levels down into the nominal range of the unit, degrading signal-to-noise in the process. Semipro users who work in the -10dBV range can enjoy proper gain staging with the unit.

Because I couldn't bypass the Type IV clipper, it was impossible to isolate the A/Ds to evaluate their performance on full-scale input. That said, the analog front end is clear and present, if a tad too present. There's a noticeable glare to the sound, but the performance for the money is outstanding.

**DIGITAL PROCESSING**

The DDP's 3-band parametric EQ could stand to be more flexible, offering only ½-octave ISO frequencies and no shelving capabilities. However, the Q range is broad enough to handle both broadband tonal shaping and notch filtering (again, provided the problem sits right on an ISO frequency). Unfortunately, the EQ sounded cold and thin to my ears.

The EQ can be inserted in the DDP's sidechain for frequency-conscious dynamics processing. However, the sidechain is global, serving the gate, compressor, limiter and de-esser at once. This all-or-nothing approach, along with the EQ's bell curve characteristic, limits the EQ's sidechain applications. Lowpass and highpass filters, or shelving EQ, would be more serviceable for frequency-conscious gating in particular, and the DDP is not always successful in this application. However, the DDP's gate performs well for general-purpose downward expansion and gating.

Included in the EQ section is dbx's TSE™, or Tape Saturation Emulation, process. TSE provides a logarithmic mapping of the input to the output at the top of the unit's headroom, plus a choice of four variations of tonal shaping. To my ear, the darker settings take away air and detail and the brighter settings make the sound more brittle and icy. Arbitrary tonal shaping isn't my cup of tea, and I suspect that most pro doing critical recording will want to turn the TSE off and use a good multi-band equalizer to fine-tune their tracks and mixes. Hobbyists may appreciate the instant gratification that the tonal variety provides.

All of the DDP's dynamics processors have access to dbx's Transient Capture Mode, or TCM.™ TCM delays the audio signal, by a user-programmable amount, from 0 microseconds to 3 ms. This gives the dynamics processor a chance to react before the attack of the sound, giving in effect an instantaneous attack time. TCM is global, so it is applied simultaneously to all dynamics processing.

The compressor, gate and limiter all offer a wide range of parameter adjustments. I especially appreciate the fine increments in the ratio and threshold values. However, there are so many steps for attack, hold and release that a fresh glass of milk can go sour before you scroll from one end of the range to another! For example, do we really need 110 steps between .1 ms and 200 ms compressor attack time? No matter how good the quality, I worry about the data wheel wearing out a couple of years down the line with so much spinning required. I've seen it happen too many times on all sorts of gear.

When set up with care, the DDP's compressor can handle percussive material with broadband spectral content without pumping. Using low ratios and high thresholds, the sound is clean and

transparent. At .1 ms attack time, however, the compressor sometimes distorts on transients, even with long release times.

Both hard-knee and OverEasy® compression are offered, the latter providing a range of ten progressively softer knees. Auto and manual compression modes are also included. Where heavy compression is required, manual control of attack, hold and release times is a must. Auto mode, as well as harder knees in manual mode, can cause very noticeable pumping.

I was not impressed with the DDP's limiter, which offers only a .1 ms minimum attack time, leading to routine transient overshoot. The limiter pumped noticeably when pressed to deliver only 4 to 6 dB of gain reduction and, even with moderate to long release times, tended to distort on percussive transients. When using the DDP's A/Ds, my recommendation is to turn off the limiter and stick with the Type IV clipper, a much better performer.

The DDP's de-esser was a pleasant surprise. While remastering a folk album with the DDP, I found that the de-esser reduced sibilance on a female vocal without pumping or leaving "holes" in the mix, an impressive feat.

**CONCLUSIONS**

The DDP performs well with moderate amounts of digital processing and slower attack and release times. But for more rigorous applications, the DDP is probably not the best choice.

The analog Type IV clipper sounds great and is, in my mind, the DDP's best feature. But the fact that you can't bypass the clipper limits the unit's use as an A/D converter mostly to applications involving popular forms of music. And, because of the analog inputs' high sensitivity, I would not use the DDP in critical recording situations, where pro levels are standard and signal-to-noise is of paramount importance. The DDP is best suited to the semipro engineer or hobbyist who deals strictly with popular music. For this type of user, the DDP's attractive pricing and numerous features add up to a fair value.

dbx, 8760 South Sandy Parkway, Sandy, UT 84070; 801/568-7660; fax 801/568-7662. Web site [www.dbxpro.com](http://www.dbxpro.com). ■

*Michael Cooper is the owner of Michael Cooper Recording, located outside the small resort town of Sisters at the base of the Oregon Cascades.*





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# TC WORKS SPARK

## DIGITAL AUDIO MASTERING EDITOR FOR MAC OS

After years of creating top-selling plug-ins for Pro Tools, VST and DirectX formats, TC Works has taken the next step with Spark, a comprehensive set of audio editing, processing and mastering applications for Mac OS.

Spark works with any ASIO-compatible sound card (or Pro Tools via Direct I/O)—with up to 24-bit/96kHz resolution—and supports AIFF, SD2, QuickTime and .WAV files, as well as file export to an Adaptec-format playlist for CD burning. The system can also load audio data directly from a CD-ROM drive. Loopmeisters will appreciate Spark's support of Roland, Kurzweil, E-mu, Yamaha and Akai samples. VST plug-in support is standard; TDM plug-in support will be offered in a future version.

### INTERFACE BUILT FOR SPEED

To provide quick access to files and signal processing, Spark is divided into two main windows:

The Browser View provides waveform editing, play listing and project file management; Master View offers master level controls, real-time signal processing and an innovative FXmachine™ effects routing matrix. Spark's two-window approach to divide the production process makes for speedy operation, but users are not boxed into a structured system: The interface is easily configurable via movable borderlines to provide exactly what you want to see. Additionally, all files, FX,

playlist and window settings can be saved as a Project file for recall at any time.

The Browser View combines the file database, audio editor and playlist into an integrated workspace, with all editing tools right in front. Any file can be instantly previewed by simply hitting the Play button, which also brings up a waveform in the editor screen. Here, the user again has the choice of working with single or multiple waveform windows. The Play List offers drag-and-drop creation from the File View, with variable crossfades. The Transport window has a location display, tape recorder-style controls and a jog/shuttle wheel for

varispeed, scrubbing and timestretch operations.

The Wave Editor's advanced features include on-the-fly marker placement (even during record!), 2x/4x play for audio searching, a variety of offline processing (normalize, reverse, gain change, sample rate/bit depth conversion, fades and crossfades) and real-time  $\pm 25\%$  time stretch and pitch correction. Offline time stretch is also available, providing slightly higher quality and the ability to define changes in BPM, seconds, SMPTE frames or beats/bars. And when recording files, up to two plug-ins can be applied to the input signal.

### MASTER VIEW

The Master View provides all master controls, including high-res PPM and phase metering, a display of consecutive clips, CPU performance meters, integrated dither select (8/16/20/22-bit, uncorrelated) and access to the FXmachine signal processing matrix. One of Spark's most powerful features, FXmachine is a simple

to use, real-time system routing up to four parallel streams with up to five VST-compatible plug-ins on each stream, offering fast and flexible effects routing for sound design, creative manipulation or mastering applications.

Included with the system is Spark: Native CL, a TC-quality dynamics processor with a single-band compressor/limiter, optimized for mastering. Although Spark: Native CL comes at no charge, this is no "stripped-down" processor; it offers full input, output and gain reduction

metering, a visual histogram level distribution display and independent attack/release/threshold/gain make-up controls for the limiter and compressor sections. (The compressor also adds soft-knee switching, output gain and ratio controls.) As a bonus, Spark: Native CL can be used independently with any VST-compatible application, such as Cubase, Logic or Vision DSP.

Spark is slated to ship this month and will be priced at \$499. For more information, contact TC Works, 790-H Hampshire Road, Westlake Village, CA 91361; 805/373-1828; fax

805/379-2648. Web site: [www.tcworks.de](http://www.tcworks.de).



Spark allows users to arrange/resize screens as necessary. The FXmachine routing is shown at lower left.

BY GEORGE PETERSEN





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The Tour That Never Was

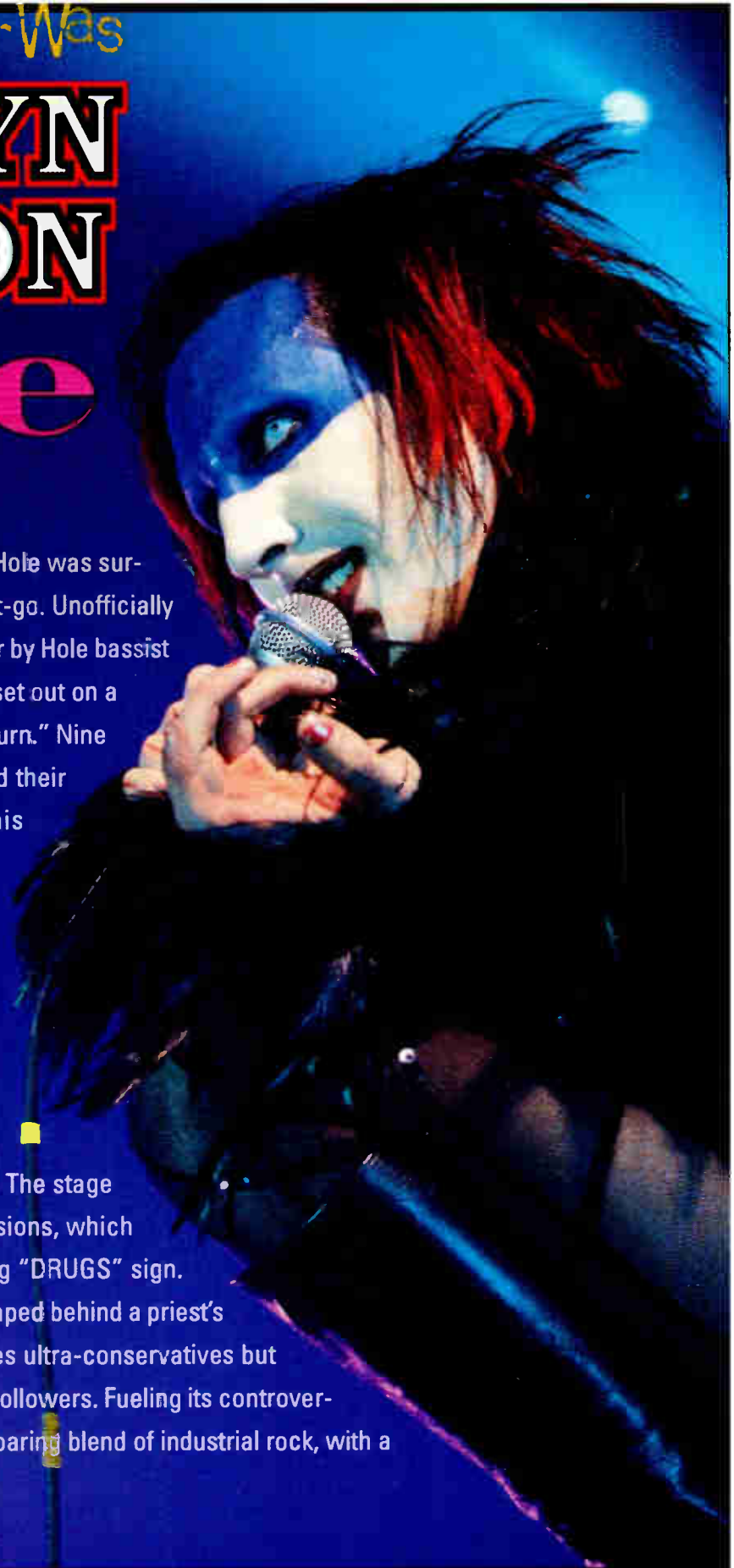
# MARILYN MANSION and Hole

By Anne Eickelberg

The pairing of Marilyn Manson and Hole was surrounded by controversy from the get-go. Unofficially dubbed the "Beautiful Monsters" tour by Hole bassist Melissa Auf der Maur, the package set out on a 40-city journey, only to "crash and burn." Nine shows into the tour, Hole announced their departure, then Manson injured his ankle so severely that several shows were canceled. *Mix* caught the sixth and seventh shows at the Cow Palace in San Francisco and the Arco Arena in Sacramento, Calif., before all hell broke loose.

## THE DOPE SHOW

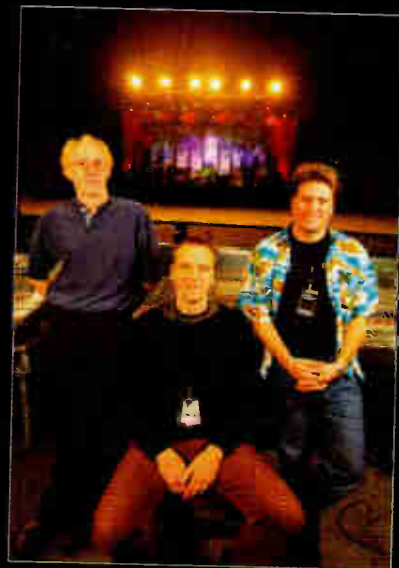
Marilyn Manson put on a spectacle. The stage set included a cross made of televisions, which was set on fire, and a huge, flashing "DRUGS" sign. Pseudo-Fascist iconography was draped behind a priest's pulpit—nose-thumbing that infuriates ultra-conservatives but appeals to the band's young, freaky followers. Fueling its controversial imagery, the band generates a roaring blend of industrial rock, with a nod to glam and a snide take on goth.







*Courtney Love*



*(L to R) Jim Staniforth, Electrotec system tech;  
Jacques Von Lunen, FOH engineer for Hole;  
and Brad Madix, FOH engineer  
for Marilyn Manson*



*Maxie Williams, monitor engineer for Marilyn Manson*



*Michael Prowda, monitor engineer for Hole*

*Photos By Steve Jennings*

Front of house engineer Brad Madix has been with Marilyn Manson since the band's October theater tour and has worked with Electrotec and its Crown-powered V-DOSC speaker system for a long time. "The V-DOSC software makes for an easy transition," says Madix. "The bump up to arenas changes the lighting and stage show more than the sound." Each day Madix and system tech Jim Staniforth use range-finding binoculars to measure the venue. Then they plug the dimensions into the V-DOSC spreadsheet in order to pinpoint exact coverage angles and determine the numbers of cabinets to be flown. The side arrays, flown six to eight deep depending on the venue, are used to help produce a stereo image for people seated on the sides of the arena.

"Because the V-DOSC system is pretty predictable about how its going to throw into the room, we can decide if we're going to go ten-deep or 12-deep," explains Madix. "We play with the angles before we even start putting it up." Madix also uses Metric Halo's Spectrafoo and EAW SMAART Pro software packages for acoustic measurements.

The Marilyn Manson show feels and looks chaotic, but Madix stresses that this is one of the few bands he's worked with who didn't need help getting their live sound together. "They know what they want," says Madix. "They give me *carte blanche* as far as how I accomplish it, but when we talked about how something should sound, it's about how it came off on the record."

The 35 inputs from the stage are routed to a Midas XL4 console at FOH, which Madix selected because he loves the EQ and because its scene recall function allows him to change effects sends and routing easily during the show. Many of the band inputs are dedicated to Manson's arsenal of mics: an Audio-Technica headset (73a mic through a ATN T75 transmitter) he uses while skittering around stage on very tall stilts and crutches, a Shure wireless Beta 58 and a slew of wired Shure Beta 58s, which he regularly destroys during the show. Monitor mixer Maxie Williams has a collection of damaged mics that have been split open or sport exploded capsules. "Manson respects me enough to not throw the wireless into the crowd," says



Marilyn Manson onstage

PHOTO: STEVE JENNINGS

Williams, who acknowledges Shure for keeping the tour stocked with replacements.

Even when he's not trying to kill the mic, Manson's vocals can be a challenge. "Because the vocals are often distorted and/or covered with some strange effect, I have to be really careful to keep the high end of the vocal mic clear so that the untreated vocal has a bandwidth that can cut through," says Madix. "Also, I have to pay attention to the low-midrange in the vocal, because low-mids tend to get pretty cloudy in arenas. I limit the vocal using a UREI 1178 and then I use a BSS901 dynamic equalizer, which allows his voice to be bright without getting too abrasive and ducks out the low-midrange when it tries to pop out. Also, I use a BBE Sonic Maximizer across the vocal subgroup, which helps the vocal and the vocal effects cut through."

Vocal mics aren't the only ones that get smashed. The entire stage is at risk, and it's common for the band to trash everything at the end of a set. Because of this, both bass and guitar go through Hughes and Kettner DIs only. Madix "stereo-izes" John 5's heavily effected, mono guitar signal by running it through a Harmonizer.

Drummer Ginger's two kicks are miked with Shure SM91s, and Madix uses a Ddrum trigger clamped onto each rim to trigger a big low-end (50 to 60Hz) sample for the house mix. A pair of Audio-Technica 23HEs pick up the snare top, with AT4053s on the snare bottom, hi-hat and ride. Shure SM98s are used on the toms and AT4050's for overheads. "I actually get a lot of sound out of the overheads—more than a lot of bands I've worked with," comments Madix.

The keyboardist, Pogo, runs his instruments through an onstage mixer.

According to Madix, Pogo has put much time and effort into programming, including some very dramatic stereo panning. "I simply take the output of his mixer direct and insert Aphex Dominators on the left and right to really define the dynamic range of the keyboard parts," says Madix. "Regardless of the sound he plays, or the level that comes out of the mixer, I can sit his parts right in the mix."

"The entire band is distorted," Madix continues.

"You have to find a place to stick everything in the mix so they don't wipe each other out. At some points, it's supposed to sound like one big thing, but you still need to define the beginning of one and the ending of another. [I try to] find places in the midrange, some 1k to punch up the bass, maybe pull some of that out of the guitar and put something a bit higher on the guitar so that it cuts through."

#### FLIP THE BIRD MEANS TURN IT UP

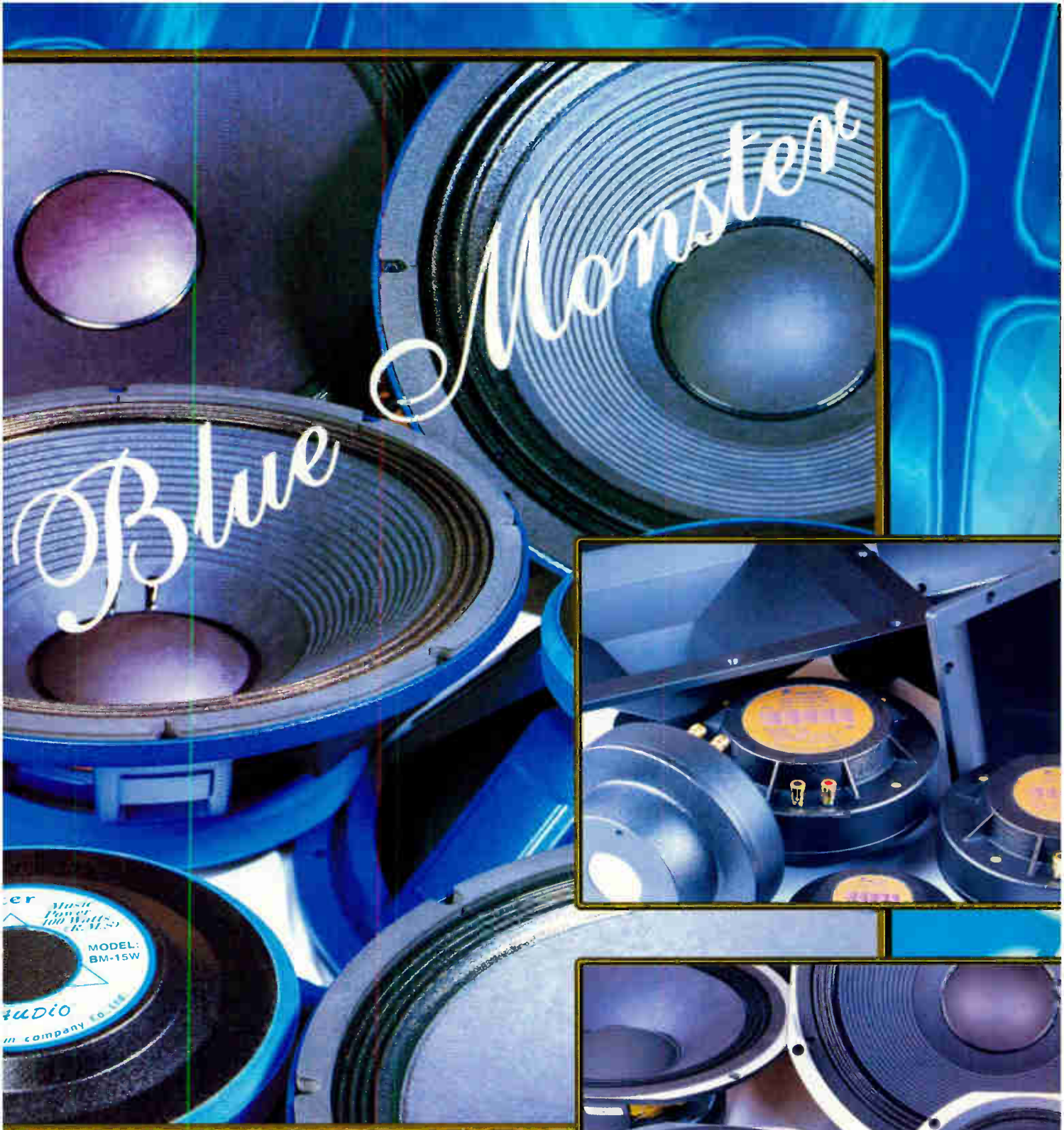
Williams has mixed monitors for Marilyn Manson for five years. "It's been interesting," he admits. "As Manson says, 'It's been a long, hard road out of hell.'" As Manson's popularity has increased, so has the number of inputs. Williams was using a Midas XL3 console for the theater tour last year, so, for the move to arenas, he upgraded from a 16-channel expander to a 24. He has gone from eight mixes to 16 and is now trying to find one more output and input.

A new addition to Williams' effects rack for this tour is a TC Electronic Finalizer. "It's everything built in that you could ever ask for," says Williams, who uses it to replace four or five rackspaces worth of EQs and compressors. "It's on Manson," he says. "Same thing for Ginger's ears."

Since the MTV music awards, Manson and drummer Ginger have been using Ultimate Ears UE5 Pros in-ear monitors fed by a Shure PSN600 transmitter/receiver. But the band is very keen on low end and is not yet ready to give up the custom-designed Electrotec wedges, which feature JBL components and are all Crown-powered. Ginger gets a double-18 subwoofer and a shaker for his drum throne. In addition to the flown V-DOSC sidefills, there are 18 subwoofers on deck.

Williams says that in-ear monitors





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make his job a lot easier. "Manson now has everybody in his ears except background vocals, whereas in the clubs I may've had just vocals in the floor wedge with guitar. Now Manson's hearing a lot of everything—drums, guitars, D88 left and right—and I run a mono SPX900 reverb and a 5565 mono delay on him. He's not much into reverb, so I just dampen his vocal a little so he doesn't sound like he's in a little box by himself. We get along a lot better now."

### AROUND THE HOLE STAGE

Though Hole's stage setup is Spartan compared to Marilyn Manson's, their sound is full-on. FOH mixer Jacques Von Lunen strives to blend Hole's post-punk rock/L.A. pop mood swings into a powerful squall. Courtney Love's petulant attitude, whisper-to-scream singing style and occasional aggro guitar strumming attract a lot of media attention and teen fandom, but the wall of sound can be attributed to founding member Eric Erlandson's guitar playing and songwriting abilities.

Erlandson plays through two true stereo pairs onstage—one set by Mesa Boogie, the other by Matchless—and all four cabinets are miked with Sennheiser 409s. Erlandson controls his two racks of various effects with his own switching system, so Von Lunen concentrates on adjusting overall EQs and levels in the more reverberant rooms. "I don't do anything else to the signal," he says. "I assign the four mics to one VCA master so I can change the balance of the whole guitar sound to the rest of the band from song to song."

Love made the transition to a Shure wireless on this tour, singing into a Beta 58A capsule. Bassist Auf der Maur just switched from an Audix OM5 to OM6 vocal mic, and Von Lunen is pleased with the improved off-axis rejection. Both vocal inputs are run through Summit mic pre's, Klark Teknik EQs and Antares Autotune automatic pitch correction devices. "It's just great because, unless you're the most seasoned performer, you're never going to be pitch-perfect," explains Von Lunen. "You know, bad room sound, running around and all that. With Autotune that problem's solved."

According to Von Lunen, visuals



PHOTO: STEVE BERNING

Hole

are important for Hole, and the band "don't want the stage looking like a music store." All but four mics are mounted, and there are no high-flying drum overheads—the pair of AKG 414s are only three or four inches from the cymbals, almost pointing at drummer Samantha Maloney. "It would be nice to have a pair up high," says Von Lunen, "but this configuration is great for eliminating spill from guitar amps." A Shure B52 gathers the body of the kick drum, and an SM91 adds in a "silky top end." Around the kit there's a Beta 57A on snare, AKG 451 on hi-hat and 460 on the ride cymbal. After some A/B'ing, von Lunen switched from Sennheiser 504s to Audix D4s on the toms. "For this kit, at least, it works great," he says. "The toms are really present; you can hear them through a wall of guitars."

Love's guitar setup is rock-simple, says von Lunen—one effects pedal and a Boogie amp and cabinet, miked offstage. Auf der Maur plays her bass through an SVT810 cab and a reissue of the old Ampeg B15, powered by Ampeg SVTs. Von Lunen loved the sound of the B15 and tried miking it, but had to crank the mic so high it picked up everything else onstage. He reverted to a combination of Countryman DI and a D112 on the 8x10 cab, which help the bass cut right through.

### IN-EAR MISSIONARY

Autotune may help the vocals out front, but monitor mixer Michael Prowda gets them going in the right direction by weaning the group away from wedges and into in-ears. Love, Auf der Maur and Maloney are all on Ultimate Ear UE5s, though each still relies a bit on wedges, mostly for "feel." Erlandson sticks with a couple of wedges and the sidefills, which in-

clude three V-DOSC cabinets plus three Electrotec single-18s per side.

Prowda experimented with different outboard gear, adding a Summit mic pre and Tube-Tech tube compressor for Love's vocals. "The Summit is cool," he says. "It has this little overdrive function where if she's screaming it distorts a little bit and gives the illusion of loudness." The 40 inputs on the Midas XL3 are all in use, thanks to audience mics and several stereo effects returns. Prow-

da's station mirrors Marilyn Manson's. "The outputs from my Midas that go to the sidefills and wedges have to get to the amp racks onstage left," he explains. "The most expedient way of doing this is to go through Maxie's console via the Group Sub ins. I have Maxie bypass his graphic EQs on those mixes and am able to be independent of his EQ settings."

### YOU TAKE THE LOW ROAD, I'LL TAKE THE LOW-MID ROAD

At FOH, Von Lunen's Midas XL3 sits next to Madix's XL4. Von Lunen is using 25 inputs from the stage and seven stereo returns. The effects are "standard stuff," says Von Lunen—Lexicon 480, TC 2290, two Yamaha REV5s, a Yamaha SPX90 for some distortion patches, 12 BSS compressors and eight Drawmer gates.

At show number six, Von Lunen was still getting used to the V-DOSC system. "I'm liking it a lot better than at the beginning," he admits. "I am impressed with the control of it, the pattern; there's no reflections from the roof, and that by itself is really nice. It definitely takes a different approach. You have to be very careful about EQ and phasing and things being panned a certain way. It's really important, and sometimes it's hard to keep track of during a fairly wild live show."

When the lights went down in the boxy arenas, the engineers rose to the challenge. Both bands sounded good enough to get the goth/indie-dressed kids dancing and singing along, at least when the two camps weren't trading insults and hand gestures. Too bad the rest of the country won't get to experience the uneasy yin-yang of Hole and Marilyn Manson. ■

Anne Eickelberg is a Mix editorial assistant.

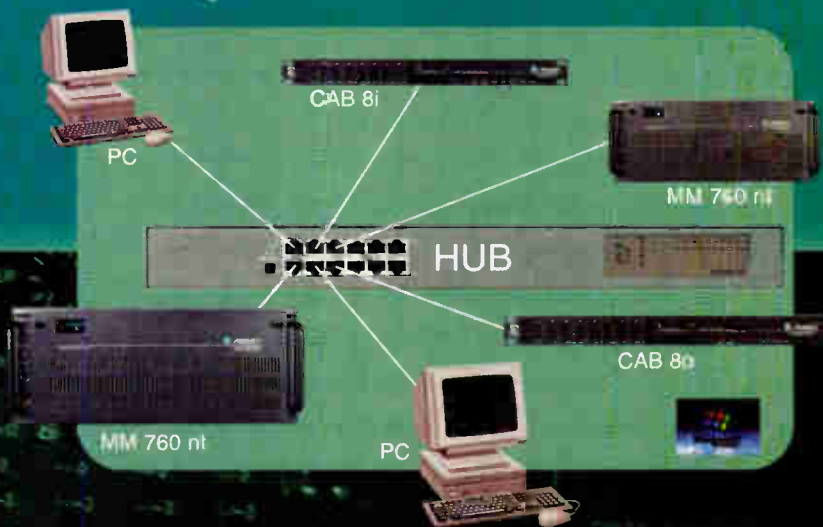


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# LOUDSPEAKER TRENDS

## THE STATE OF THE ART OF SYSTEM DESIGN AND MANUFACTURING



nce upon a time, when there were only a handful of large-scale loudspeaker system manufacturers, enterprising sound companies typically built their own speaker cabinets, loading them with the drivers and electronic components best suited to the budget and intended application. As in all

the best business models, supply expanded to meet demand, and, once system manufacturers had enough orders on hand, economies of scale in both production and R&D tended to outweigh the perceived benefits of custom systems. Today, a manufactured system from a recognized supplier offers a sensible alternative to home-brew solutions, and a wide array of professional-quality off-the-shelf speaker systems are now available at a variety of price points.

With the plethora of manufactured systems available today it's worth stepping back to survey current trends in loudspeaker system design. A major influence on current system design is the computer. Now more affordable and versatile than ever, computers and associated measurement and manufacturing technologies have been used to advance the design and manufacturing process. Another irreversible trend has been toward compactness. Increasingly tight budgets for live productions, which must nevertheless satisfy artists' and audiences' appetites for greater production values, encourage efficient system designs that take up less truck and hanging space.

### AMPS IN SPEAKERS

Recently, some speaker manufacturers have developed self-amplified, modular, full-range subsystems that require only AC power and a line-level input signal. There are several benefits of self-powered designs. The material costs of amp racks are eliminated, and considerable space can be freed up, both in the truck and at the venue. Since amplifier/speaker load characteristics may be very closely defined, integrated amps and processors may be optimized for specific drivers. The cable runs within an integrated system are, of course, very short, which can greatly simplify the design.

Gain differences, amp flavors and connector incompatibilities are virtually eliminated in self-powered systems, simplifying the cross-rental of inventory. Individual control of each speaker via line-level processors allows levels, frequency response and delay times to be individually manipulated for greater deployment flexibility and array optimization.

Of course, companies that up-

grade to a self-powered speaker system must face the problem of recycling a large part of their older, nonintegrated inventory. It may make more financial sense to sell off a used P.A. in its entirety, rather than simply relegating old cabinets to the back of the shop to be slowly stripped of drivers, castors and connectors.

There's also the problem of re-engineering the sound system infrastructure. Though speaker cables are eliminated, line-level signals and AC power now must be distributed to each cabinet. With amplifiers integrated into speakers, adjusting individual channels often goes from inconvenient to impossible, so manual volume controls are eliminated, reinforcing the push toward control and monitoring solutions for amplifiers, along with distributed processing. The hope for a universal standard for computer control by the end of the century may lead us to the Holy Grail of a self-equalizing sound system.

Several speaker manufacturers already make traditional amplifiers along with processors for their own products, and many leading amplifiers have provisions for onboard processing. Since self-powered products compete directly with traditional amps, it would be surprising if many amp manufacturers didn't already have competing designs on their drawing boards. How long can it be before off-the-shelf speaker-mount amp modules become available for proprietary builders?

### MORE POWER

Over time, increasingly powerful amplifiers have forced transducer manufacturers to rise to the challenge. The materials and geometry of the voice coil, magnet and motor assemblies of transducers have remained unchanged for decades, with minor refinements offering incremental advances in power handling. Ferrofluid, which changes the thermal properties of the voice coil, has been widely accepted as a tool for increasing transducer power handling. The introduction of neodymium magnets has produced some weight savings, and better adhesives, formers, cones and coils have gradually increased power handling in professional products.

Recently, the introduction of a double-voice coil topology in several successful speaker products has created interest from not only buyers of manufactured speaker systems, but also those who use transducers in their own proprietary systems. The idea of using dual differential voice coils goes back nearly a half-century to the days when power-handling in speakers was not a big concern. An AES paper by Doug Button describes how, by designing a magnet with dual gaps of opposing flux and using twin differential voice coils, power handling is doubled or

BY MARK FRINK

—CONTINUED ON PAGE 190



**TOUR  
PROFILE**

# LAURYN HILL LIVE

*Hip Hop Superstar Hits the Road*

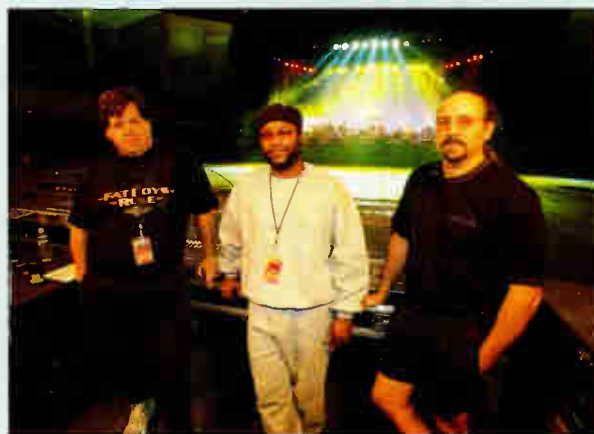


Lauryn Hill was only 15 years old (and working part-time as a soap opera actress) when she got together with high school classmate Wyclef Jean and his cousin Prakaziel "Pras" Michel to form The Fugees. Their careers took off with the 1993 release of their debut album, *Blunted on Reality*; and their follow-up, *The Score*, went on to sell more than 17 million units and won two 1996 Grammy awards, for Best Rap Album, and for Best R&B Performance by a Duo or Group with Vocal for their cover of the Roberta Flack classic "Killing Me Softly."

Last fall, Hill released *The Miseducation of Lauryn Hill*, and it was an instant favorite with critics and fans, soaring to the top of the charts. On this, her first solo endeavor, Hill not only showcases her vocal talents but demonstrates writing, arranging and producing abilities, infusing hip hop and rap with intimate '70s-style soul and reggae.

Hill recently embarked on a world tour to support her album; *Mix* caught up with the West Coast U.S. leg at the Bill Graham Civic Auditorium in San Francisco at the beginning of March, when the hip hop sensation was still celebrating her success at the Grammy Awards—ten nominations and five awards (Album of the Year, Best New Artist, Best R&B Song, Best R&B Album and Best Female R&B Vocal Performance) for *Miseducation*.

The low-key mood of the show prelude, a stirring sing-along accompaniment to a recording of Bob Marley's classic "Redemption Song," immediately gave way to excitement as Hill and her 16 backing musicians, two DJs and MC launched into a dynamic two-hour set, featuring performances of Hill's solo material, sprinkled with lively renditions of '70s soul classics and a few Fugees hits.



(L to R) FOH engineer Meaux Windhorst, FOH mixer "Commissioner" Gordon Williams and system engineer Greg Hancock

### SPONTANEITY IS KEY

The show is improvisational, and the set changes from night to night; keeping up with the musicians is a tough job. Front-of-house mixer "Commissioner" Gordon Williams, who joined the tour after mixing *Miseducation* (he, too is basking in the Grammy glow), explains his free-form approach to mixing the performance. "It's more like arrangement, and it's spontaneous," he says. "I never mix the show the same way any night. I

couldn't even tell you what I do

BY SARAH JONES

—CONTINUED ON PAGE 186

## ALL ACCESS



Before heading out on the road for a summer tour of arenas and sheds, Tom Petty & The Heartbreakers were back in San Francisco for a seven night stint at the famed Fillmore Auditorium. As well as playing songs from their new album, *Echo*, along with many old favorites, Petty also gave the fans a treat when he played a few tunes during the final two nights with special guest Bo Diddley.



Bo Diddley with Tom Petty

"Because of space constraints at the FOH position, I'm using a Gamble EX while here at the Fillmore," says FOH engineer Robert Scovill. "However, I'll probably be using a Midas XL4 or a new Heritage 3000 on the tour. The drive rack contains BSS Varicurves, TC Delays and an Avalon opto-comp/limiter which I use across the mix bus. The delays are used to time-align the P.A. system with the back line. Time alignment is very important in a room this size, especially for dynamic mixing, because it gives you the ability, in terms of fader moves, to be very quiet or very loud without it appearing to move the stage volume in and out of the mix. This show is an absolute study in dynamics—it goes from a whisper to a roar in a heartbeat—so to make something really time coherent for the audience is very important. I am using SMAART to do all the P.A. tuning and time delay setting and running real time FFTs during the show." After some debate, Scovill decided to use the Fillmore's house P.A., a Meyer system, for the Fillmore dates. Electrotec is providing a V-DOSC P.A. system for the summer tour.





"My take on mixing this band is that the whole show revolves around the vocal," says Scovill. "If that part of it is happening, if it's clear and intelligible, the rest of the mix easily falls into place. Tom uses a Shure SM57 mic for vocals, which he's been using ever since I can remember; while getting a vocal sound out of that mic is one of the more challenging things I have ever attempted, I am amazed some nights at what I do get out of it. I'm pretty excited about using these newly re-released Purple Audio 1176 reissues—the UREI 1176 Blackface LN has been a staple of the audio industry and my arsenal for years, and Purple Audio is reissuing them part for part. They're fantastic—I use them primarily on Tom's vocal and all the acoustic guitars. This band's influences are heavily rooted in the late '50s and '60s as far as their approach to guitars, amps and sounds, yet it is portrayed in a contemporary format that is really powerful. It's very refreshing, and I try very hard to be true to that at FOH. Also, the shows are very 'loose' in terms of format and require a developed sense of where the songs are at a given moment and where they are going. I really have to be on my toes, and a lot of my moves are based on watching visual cues between bandmembers; I relate these to musical cues, which in turn relate to mix moves. It is a wickedly cool symbiosis between band and mixer when it is really happening."



"I've got a Midas XL3 board with me," says monitor engineer Brian Hendry. "My amplifiers are Crown Microtech 3612s that we use with the PIP card as a crossover in them—3,600 watt bottom end, 1,200 top end; they're the best. We use Drawmer gates and compressors on drums, and for Tom's vocal insert a Lark Teknik DN27 and a Summit leveling amplifier. Tom uses one in-ear monitor; he doesn't want to be completely isolated, but it helps him with pitch. He doesn't take his mic off his stand, so when he's standing there in front of his wedges I bring his wedges up as loud as normal and then bring in the rear to fill; it really enhances everything—you don't even notice it's in most of the time. When he moves off to the sides there's enough backline that bleeds straight into it, without bringing the mix into it. Also, with just one ear bud you don't need to bring in overhead mics, etcetera. As opposed to an overpowering big rock mix, this is more refined, more dynamic; I've been able to cut back a lot of it and just enhance the actual music."

"Tom uses 57s for the guitar amps; for drums we use an 88 and a 91 for the kick drum and Audio Technica mics for rack toms and overheads, which are Neumann compatible. About the only new addition to Tom's area is some MXR pedals; otherwise he and the band have been pretty consistent."

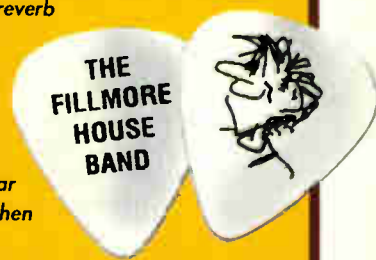


"For guitars Tom's got a Flying V, Gibson 335, Fender Telecasters and Gibson acoustics," says Alan "Bugs" Weidel, who is the tech for Petty, bassist Howie Epstein and guitarist/keyboardist Scott Thurston. "Scott plays Stratocasters or a Les Paul, and a Gibson or Takamine for acoustic. Howie uses either a Fender or a Danelectro. For amps, Tom uses a Fender Bassman sometimes with the Leslie, and sometimes he uses a Vox AC30. For foot pedals he has an Ibanez tube Screamer, a Boss digital reverb delay, a Red Llama overdrive, Vox wah-wah pedal and a Tremulator. Howie uses an Aguilar with SWR bottoms, and Scott has an AC30."

Steve Winstead, guitar tech for Mike Campbell, says the guitarist has with him a Blond Bassman, a tan Fender AC30, a custom model 250 and a Princeton reverb. "Mike uses a custom audio electronic switching system with one-in, eight-out, four loops, a Roland SD3000 delay and Danelectro outboard pedal effects, which he just started to use. He's really hot on the Daddy-o nowadays. As far as other effects, his custom guitar has tremolo, reverb and distortion in it, as well. Mike also has a Vibratone, which gets the sounds you hear when they play the song 'You Don't Know How It Feels.'"



Techs Steve Winstead (L) and Alan "Bugs" Weidel



—FROM PAGE 183, LAURYN HILL

from time to time, because it's all how I feel, whether I put a delay on, or bring something up, or pull something back, or pump the system on a certain part of the song, or turn it down so the crowd can hear the vocal more—it depends from night to night.

"[Lauryn] really operates on improvisation; she's very inspired, she may hear something that day [that she wants to play]," continues Williams, who, as an example, recounts a discussion with Hill earlier that afternoon, when she was considering learning Tony Bennett's "I Left My Heart in San Francisco" for the show that night. She decided against it.

"It's really exciting because you never really know what may happen or change at the show," says Williams. "But at the same time, if you're not really on top of all that's going on, it could be very difficult, because you've got 16 people going at once and you have all these open microphones and so many things happening that if everyone's not in sync, it could be disastrous. The guitar player's playing acoustic, then he's switching to an electric; the bass player's playing a different bass, the percussionist is going from timpani drums to wind chimes—as dynamic as that."

It no doubt helped that Commissioner Gordon also mixed the record and that he has an affinity for musicians. Producing, he says, is his first love, and he has been producing and engineering professionally since his first album was released in 1986. He also has been an artist and producer with Motown and Sony for most of that time and is currently doing A&R for Sony. He is also a professional DJ. He met Hill three years ago, when they both worked on the *Panther* soundtrack.

"We stayed in contact because at the time I was kind of in the hip hop scene," he says. "I started doing a lot of work at Sony—I mixed Will Smith's *Men In Black*—and I came back in contact with Lauryn, and she asked me to come in the studio with her and work on her record. She really wanted to incorporate the live instruments with a lot of the electronic stuff; we were both sort of figuring things out as we went along." The album took just over a year to complete, and when they were nearing the end of the project, Hill began talking with Williams about him accompanying her on tour. He had much the same studio-live relationship a few



PHOTO: STEVE JENNINGS

Monitor engineers Rick McSorley (L) and Vish Wadi

years previously with KRS-One.

But the game is much different onstage than in the studio, and Williams had his own adjustment period during the first couple of shows, mostly in dealing with mics, "just being able to keep the vocal above the music in certain places where you have to play loud. Especially with a lot of hip hop, it's a lot of low end and just a lot of driving the system hard, and when you have open microphones and you're driving a system like that, you stand to get a lot of feedback. Once I got a technique being able to work that, that was fine. Like a DJ, where he's at line level, and you can turn the DJ up as loud as you need to turn it up. But he's right next to the drummer, or the saxophone player, who has an open mic on his horn."

#### TOOLS FOR MANAGING THE SOUND

Sound for the tour is being provided by Dallas-based Showco; Showco system engineer Gregory Hancock (who joined the tour after stints with Reba McEntire, Limp Bizkit and, most recently, Third Eye Blind) talked about the mid-sized system being used on this theater tour: "We're carrying what is actually a theater Showco Prism<sup>®</sup> rig," says Hancock. "We're only carrying 20 Prism enclosures, but we're carrying a large sub complement—12 Prism subs. We have 13 BFM600 Showco wedges and an additional ten Prism SRM wedges, and we also have four Prism underhung/nearfield enclosures. We have 17 musicians onstage; we are doing mostly 2,300- to 3,200-seat theaters, so it's very tight, very demanding."

The front-of-house rack is equipped with outboard essentials: dbx 160s, Drawmer 201 gates, dbx 903 compressors/904 gates. Effects include Yamaha SPX90s, Eventide H3000s, Lexicon PCM

42, Roland SDE3000 and a Summit TLA100 tube compressor. Williams says he uses effects sparingly, and those he applies vary from night to night. "I have basic reverbs that I may try from room to room, I may fool around with some delays on some instruments, on some vocals, on parts to accent certain things, but there's nothing really that I plan; I just kind of keep things ready. Sometimes I don't use anything, sometimes the show'll be just straight up.

"I don't really like too much compression, and [Hill] doesn't like compression at all," says Williams, who cops to using some on the DJ and a bit of light compression on the overall system. "If you even say that word around her, she'll just freak out, because she always says that compression feels like it limits her voice. It takes away her dynamic range. One thing about Lauryn, she does go from full voice to a whisper often, to a rap—you have that transition."

Because of her dynamic range, Williams says, compression is more helpful to him in a live situation than in the studio, since he doesn't have the benefit of automation. "The console, a [Yamaha] PM4000, is fully loaded. I'm at 58 inputs, and the whole console is full. I have eight subgroups; they allow me to just ride overall sections, but the compression helps when I can't grab something, like the vocal—there may be a part where she just may sing it differently tonight than she sang it the night before. The compression does help to hold on to things, but still, I don't like to squeeze things too much."

One particular FOH challenge is matching levels during a "duel" between the band and DJs spinning records onstage. "A lot of times the DJ is switching, and every night it could be different records," says Williams. "It's not like we have a set of records that are the same all



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## LIVE SOUND

the time. Newer records have a lot more pump, more drive than an older record, and he may switch back and forth between a record from the '90s, a record from the '70s, a record from the '80s. I guess that's where my knowledge of hip hop comes in handy, because I know a lot of the records, so as soon as he switches, I'll know, 'Okay I need to crank this one up, or this one needs a little help on the bottom, or this one is going to be too much, this has a heavy 808 so I need to cut on the highpass filter because you'll get the rumble from the turntable.' So even that is spontaneous."

## CHALLENGES IN MONITORLAND

While Williams may thrive and come alive for the spontaneity, it doesn't make for an easy night for the monitor engineer. "My hat goes off to Vish [Wadi, monitor mixer], because I know the advantage for me is knowing Lauryn, and a lot of those musicians I've worked with in the studio, too," says Williams. "Vish came in as a total outsider and had to try to grasp all of these things while we were already going because we had already done six or seven shows and rehearsed for months before Vish even heard the show. The first time he heard the show was at the monitor board. And he has like 21 mixes going back there, so for him to lasso that horse is not an easy thing."

Wadi, who's working on a Yamaha PM4000M, certainly has his hands full onstage. He had joined the tour a few weeks in and was fine-tuning his process. "It's kind of hard to lock in after four shows; you have to do about two weeks of shows [before you come up with a blend that can work for all the shows]," he says. The bandmembers have individual monitor mixes; Hill and her three background singers are using in-ears, and the drummer has floor monitors plus one in-ear. And since this leg of the tour is a theater tour, space onstage is pretty limited. When asked how he manages the sound onstage, Wadi says he "keeps fingers crossed. I'm using every mix there is on a 4K—everybody out there has their own mix. We're just trying to get a musical balance up there."

For Hill's vocals, "we're trying out different mics on her—Shure, also Sennheiser. When I came in, I was getting to know her voice. We had a [Shure SM] 87 and changed that to a 58." Hill tried a Sennheiser for the Grammy Awards and has used it since. As for ef-

fects, Wadi is using a minimal amount. "There are some effects on the girls, reverb for their ear monitors, but [Hill] likes it pretty dry. Other than that, everybody's got their own effects going on in their mix." Wadi says there's nothing fancy; everything is pretty straightforward. "I do like using a lot of compressors, just to keep the information tight. In any show, [the goal is to] give the audience what they want, and at the same time find control onstage. Don't let the stage control you."

Controlling the stage is probably his biggest challenge, but Wadi says that even as tour dates are being added at the current venues, they are beginning to play larger halls, making the show easier to manage. "[We're] going in the right direction, from tiny venues to 3,000-seat theaters, to 4,000 seats. We're taking one step at a time, getting into a groove."

## WHAT MATTERS MOST

When the show is over and the house clears, Williams says, the thing he enjoys most about live work is the instant gratification it provides. "As soon as something happens, the crowd instantly responds," he explains. "When you make records, you may work on it for a few months, or in the case of Lauryn's record, a year; and then you have promotion, then the record comes out and you have to wait and see what happens. It could be a year after you did something before you see whether people like it or not, whereas live, you know right away whether they like it or don't."

"I'm part of what's going on; as much as they're doing what they're doing up there, it's like the board is my instrument—I'm playing it as they're playing it. I can feel it happening directly, and then the crowd response." Williams says it's important for the crowd to hear the records as they are supposed to sound. "If it's a record that has a heavy 808 or has a lot of low end, and the crowd knows it like that, but when it comes on it doesn't sound like that, it doesn't have the same effect. It just doesn't move them the same way; that initial adrenaline rush, what it does to people when they first hear it, when they first feel it, right at the beginning. If something comes on and that initial impact is not really right, people may pay attention but you may lose the crowd, lose that momentum. So I like to try to keep that intensity all the way through the show, so by the time it's over you feel like you've just been on a roller coaster; you feel like wow, I got what I paid my money for, it was a great ride." ■

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—FROM PAGE 182. LOUDSPEAKER TRENDS

power compression is halved while inductance is lowered.

Significant weight savings are also achieved over the traditional speaker topology by using neodymium and placing the magnet inside the coils. The use of neodymium additionally offers a reduction in flux modulation, translating to lower distortion. Adjusting the spacing of the twin voice coils can provide an increase in linearity without adding the weight of a longer voice coil.

#### COMPOSITE CABINET MATERIALS

The physical properties of speaker cabinets themselves have remained unchanged the longest. Thicker walls, denser hardwood plys and sturdier bracing have all been used to minimize the efficiency losses caused by energy escaping from the back and sides of the speaker cabinet, but all these methods add weight. For years studios have resorted to concrete construction to eliminate resonances in large-format control room monitors, but this approach is not practical for most portable applications or installations. However, materials with

higher stiffness-to-mass than wood are now becoming available, and these materials can improve performance and re-

The National Car Rental Center, home of the NHL's Florida Panthers, has a new sound system including Community CBA/CBS arena loudspeakers. There are six main clusters, each comprising CBA6060NE mid-high horn-loaded systems and CBS315 and CBS415 low-frequency cabinets. Four additional corner clusters are made up of seven CBS6060s, hung without their usual Baltic birch enclosures in an effort to reduce weight and cost...Digital Audio Research's TheatrePlay sound effects replay and editing systems are being used by leading British theater sound company Autograph for the UK tour of the Cameron Mackintosh musical *Martin Guerre*. TheatrePlay enables triggering of up to eight simultaneous effects and incorporates DAR's OMR8 8-track disk recorder technology...Sound reinforcement for the PACE Motor Sports dirt-bike race events was provided by G&G Leasing and Rentals, a division of Houston, Texas-based

Ideas Inc. The competition began Jan. 9 at Anaheim, Calif.'s Edison International Field and will tour the U.S. through May 1. The system that the tour is carrying includes JBL's lightweight Horn Loaded Array (HLA) loudspeaker system: 16 HLA model 4895 array modules are positioned on top of an aluminum grid in the center of each venue...LA Audio reports that its equalizers/processors are being used on tours by Santana (30th anniversary tour) and Deep Purple (digEQs and EQ231 EQ dynamics processors, respectively). Both of these productions are using L'Acoustics V-DOSC P.A.s...Consultants Boston Light & Sound provided more than 50 Electro-Voice theater speaker system for this year's Sundance Film Festival...The Tokyo production of the musical *The Lion King* at the Shiki Spring Theater is using a new 98-input Cadac J-Type console that includes 106 motorized faders and eight programmable dual input channels. ■

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### LIVE SOUND

gy delivered in the intended direction. (It's surprising how often the total polar response of a sound system is ignored.)

Carbon-fiber composite materials were originally developed for use in aerospace applications where weight, strength and rigidity are of paramount importance. Civilian applications of carbon-fiber composite materials now include speaker cabinets that weigh less than half as much as similar cabinets built from wood. Speakers in non-resonating enclosures provide up to 3 dB more output than the same transducers in a traditional wooden box, and, because there is no energy coming off the back of the speakers, monitor cabinets made from these materials are an engineer's dream.

An extra benefit of carbon-fiber enclosures is the extremely durable nature of the material. There is no need for paint or carpeting, and they require little maintenance. Though carbon-fiber composite cabinets cost at least twice as much to build as traditional enclosures, the extra output and lighter weight offer an attractive payback.

### LINE ARRAYS

The speaker design archives are littered with good ideas whose development was limited by the technology of their day. Modern electronics, materials and manufacturing methods now make it feasible to revisit some of these older concepts. For example, the positive coupling exhibited by neighboring speaker components that operate in the same bandwidth is well understood. Long before efficient horn-loaded designs were developed for touring systems, speaker manufacturers discovered that the combined response of a vertical line of closely coupled transducers offered improved performance, better than the sum of the individual drivers. Many speaker enclosures for public address featured this design, and engineers of a certain age will no doubt remember the Shure and WEM columns that predated horn-based systems.

As a practical matter, concert engineers soon learned that transducers and cabinets arranged in a column behaved differently when the same system components were piled in a block. This led to the common arrangement of drivers being aligned vertically, both within cabinets and throughout modular speaker arrays. Coupling between cabinets has long been accepted as a fact of life in concert sound reinforcement.

Several years ago, a landmark AES



paper co-authored by a couple of French scientists showed that when adjacent speakers are close enough, the array behaves like a single sound source having the same shape. This effect is, of course, frequency-dependent, which is why it has been observed in the low and midrange frequencies of many systems for years. The paper further established that this coupling also occurs when the total area of radiating sources is at least 80% of the total area of their arrangement. Practical demonstration of the paper's contents can be found in the V-DOSC™ system. The vertical alignment of the tall, thin openings of the unique V-DOSC high-frequency wave-guides allows the coupling to extend into the highs to match the propagation at lower frequencies. The entire array behaves as a single sound source, without beams or seams, and with well-defined coverage.

Several speaker manufacturers have already taken note of the success of the V-DOSC line array and have fielded similar systems, while others are working on designs that have yet to see a trade show. (The V-DOSC high-frequency wave-guide is patented and cannot legally be a part of other designs unless it is licensed.) No doubt there are those frantically looking for new ways to couple super-tweeters. Old road dogs are reminded of the days when metal radial horns were stacked up together in a column.

This short overview of current trends in loudspeaker system design is not necessarily a roadmap for the future. Though future loudspeaker products may incorporate some or all of the new technologies outlined above, traditional configurations will continue to serve in a wide range of applications. Though compact, self-powered line arrays made of carbon-fiber composite materials and including new, higher-powered dual-coil drivers may offer users a competitive advantage in certain circumstances, there will be situations in which the most technologically advanced solution may also be the most expensive. Successful sound system operators realize that the decision to purchase new equipment must be based on sound business reasons, as well as the desire to provide the best tools for the job. Until the return on investment of sound systems based on new technologies rivals that of more traditional approaches, the best speakers for the job may be the ones already in inventory. ■

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

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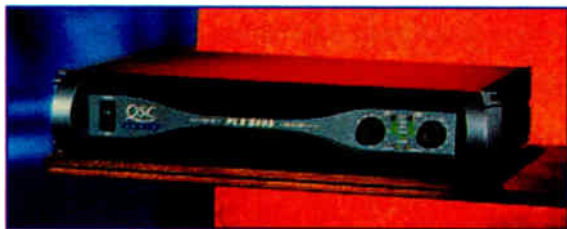
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## PEAVEY IA SERIES AMPS

IA™ Series power amps from Peavey Electronics (Meridian, MS) combine audiophile-level performance attributes (such as frequency response extending to 80 kHz) with pro reliability and advanced features. Standard amenities include Load Fault Correction (LFC™) against abnormal loads; Initialization Protection from power-up transients and failures/careless operation of gear upstream of the amps; DC protection; and LEDs for signal



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## EAW SUPERSUB JR

The EAW (Whitinsville, MA) LA400 SuperSub Jr™ subwoofer provides 139dB SPL peak, 133dB long-term (measured at 1 meter) with a frequency response of 45 to 250 Hz ±3dB (-10 dB at 40 Hz). This single-12 unit is based on EAW's dual-12 KF940/BH822 SuperSub™ design, though the cabinet dimensions conform to EAW's LA460 Virtual Array Technology™ full-range system, which it is designed to complement. Provided with a "towel bar" handle and rear-mounted casters, the LA400 handles up to 500 watts and is supplied with Neutrik Speakon NL4 connectors. It weighs 125 pounds and measures 36x21x36 inches (HxWxD). Price is \$1,084.

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## SABINE TRUE MOBILITY WIRELESS

Sabine's (Alachua, FL) True Mobility™ systems are the first wireless units with built-in FBX Feedback Exterminator, auto de-essing and compressor/limiting. Available in UHF and VHF versions, with handheld, lavalier or headset mics, the single-rackspace receivers offer a front panel charger for rechargeable batteries. Targeted Input Processing automatically assigns the right amount of de-essing or compression to maximize performance. A True Mobility feature applies Sabine's proprietary FBX circuit to eliminate feedback "hot spots" onstage, offering performers unrestricted movement. Both UHF and VHF systems offer optional front- or rear-mount antennae, extension antennae and antenna divider systems.

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## EV MS3000 WIRELESS

The MS3000 UHF wireless system from Electro-Voice (Buchanan, MI) combines the MR3000 receiver with a choice of handheld and bodypack transmitters operating on single custom-tuned frequencies in the 690 to 720MHz (TV channels 50-55) range. Featuring EV's DXN™ companding circuitry, the MS3000 System delivers a signal-to-noise ratio of 104 dB. The MR3000 receiver has a rear-panel squelch adjustment and balanced XLR and unbalanced ¼-inch outputs. Mic choices include EV's N/D767 N/DYM dynamic and the BK-1 condenser. Systems are priced from \$667 (lavalier) to \$792 (handheld).

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## YAMAHA F SERIES SPEAKERS

Yamaha (Buena Park, CA) debuts the F Series line of high-performance live sound speakers. The F12 (\$1,049) features a two-way, bass-reflex design with a 4-inch voice coil, 12-inch cast frame woofer and a 2-inch throat titanium HF driver. Power handling is 1,400 W max at 8 ohms, and integral flying hardware is included. The F12M (\$1,099) is a floor monitor version of the F12. The F15 (\$1,249) has a high-







performance, 15-inch woofer and 3-inch titanium HF driver. The \$1,499 F28 subwoofer has two 18-inch drivers in an extremely rigid cabinet (with integrated casters) and handles over 4,000 watts (peak). All F Series speakers feature carpet finish, steel grilles and handles; a unique switching design allows all F Series two-way speakers to be bi-amplified.

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#### YORKVILLE 2,000 W/CH AMP

Yorkville Sound's (Niagara Falls, NY) AP6040 2-channel power amp is capable of delivering 2,000 W/ch into 4



ohms. Featuring a toroidal transformer-based design, the three-rackspace AP6040 includes protection circuitry to provide DC, load, thermal and breaker protection, a user-defeatable peak limiter and a "soft turn-on" circuit. The unit features ground lift, highpass filter and stereo/mono switches, LED indicators and recessed gain pots. Inputs are XLR and 1/4-inch TRS; outputs are Speakon SP-4 and binding-post. Price: \$1,799, including two-year, no-fault warranty.

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#### GEMINI MOSFET AMPS

Gemini Sound (Carteret, NJ) debuts the XPM Series of stereo MOSFET amps, two-rackspace units featuring recessed front panel controls, steel reinforced chassis, toroidal transformer

and speaker protection circuitry. The XPM600 (\$599), XPM900 (\$699) and XPM1200 (\$799), are rated at 200 watts, 280 watts and 360 watts, respectively, both channels driven into 8 ohms. In mono bridge mode (8 ohm), the units are rated at 550, 800 and 1,060 watts. All XPM Series amps operate in stereo, parallel mono or bridged-mono modes. Inputs are balanced XLR or 1/4-inch jacks; outputs are five-way binding post or Speakon.

Circle 321 on Product Info Card

#### MACKIE VLZ SERIES MIXERS

Mackie Designs (Woodinville, WA) is shipping its Compact VLZ Pro 1202, 1402 and 1604 Series professional audio mixers. All feature new Extended Dynamic Range (XDR™) mic preamps offering 60 dB of gain with low noise and excellent headroom. Features include switchable phantom power, active 3-band EQ on 1202 and 1402 models (swept mids on the 1604), 75Hz highpass filter and 60mm faders. Prices range from \$459 to \$1,249.

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#### RADIAL PASSIVE DI BOX

CableTek Electronics (Port Coquitlam, BC, Canada) offers the Radial JDI Mk II passive DI box. With a frequency response of 20-20k Hz  $\pm 0.2$  dB, and close to zero phase deviation across the audio bandwidth, the unit combines simplicity of operation with uncolored sound. Protected by a recessed front panel, switches include a 15dB pad, a 60Hz filter to reduce hum, and a merge switch that combines the In and Thru 1/4-inch jacks, allowing stereo inputs to be combined to mono. The XLR output has a ground lift switch. Additional features include a Jensen transformer, internal Mogami cabling, aluminum case with non-slip pad and protective bag. Price is \$240.

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#### PRO CO CABLE ANALYZER

The Chek 1 2 3 from Pro Co (Kalamazoo, MI) is a compact, portable audio cable/connector tester that can check a cable with only one end plugged into the tester. The Chek 1 2 3 outputs 250Hz, 1kHz and 4kHz test tones at mic or line level, and the 22-ounce unit operates for over 60 hours powered by one 9V battery. I/Os include pairs of XLR, TRS and RCA connectors. Twelve LEDs indicate incorrect connections and shorts. Price is \$139.98, with three-year warranty.

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#### BAG END TA5000-C

The TA5000-C trapezoidal loudspeaker from Bag End (Barrington, IL) is designed to replace the company's workhorse TA15, yet with improved performance and a lower price. Featuring a 15-inch bass/mid woofer and an updated 1-inch exit HF compression driver, the TA5000-C handles 200 W continuous, 800 W peak and includes a passive Time-Align® crossover. Frequency response is 50-19k Hz  $\pm 3$  dB. Constructed from 7-ply poplar plywood, the two-way vented cabinet weighs 70 pounds and features recessed handles and a stand adapter. Price: \$990.

Circle 325 on Product Info Card



RECORDING NOTES



PHOTO: JAMMIE ARROYO

From left: Dolly Parton, Linda Ronstadt and Emmylou Harris

DOLLY, EMMYLOU AND LINDA

THE TRIO MAKES MORE HEAVENLY MUSIC

by Robyn Flans

Linda Ronstadt, Dolly Parton and Emmylou Harris could hardly believe they were finally all seated at the large Elektra Records conference table promoting *Trio II*. The project had been halted in 1994 near the completion of mixing, and the follow-up to their successful 1987 album had remained shelved until now. The specific reasons for the delay are still vague, but they supposedly had something to do with the impossibility of coordinating three separate artists' contracts and schedules. So Ronstadt never thought her label would agree when she suggested they resurrect this record to help fulfill her own contract.

"It was the same mess they didn't want to deal with originally—different labels,

different managers and the same can of worms all over again," Ronstadt explains. "Plus, Dolly had taken her tracks and put other harmonies on them, and I had taken my tracks and done the same thing. But I said to the label anyway, 'Would you be interested in our reassembling this record in the way it was originally recorded and putting it out?' To my complete shock, they said yes."

"I didn't think it would come out until after we were dead," Harris says. And Parton adds with a laugh, "It's like a good bottle of wine—it's been aging. I was so excited when I got the message about the record getting released I'd been praying ever since we stopped it that it would come out because it was so great."

Parton's busy schedule hadn't permitted her to attend a few of the earliest sessions at the

honey rural studio known as The Site in Marin County, where producer George Massenburg tracked the initial sessions. "It's very complicated because you really want the vocalist to be there when you set up the tracks to make sure you're starting off in the right direction—particularly the key, but also the timbre of the track, to make sure you're supporting the vocal well and to make sure the song is being well-represented," Massenburg explains, adding that Alison Kraus subbed for Parton on "I Feel the Blues Movin' In" so they would be sure of the

—CONTINUED ON PAGE 203





# BARENAKED LADIES

SHOWING GROWTH WITH "STUNT"

by Paul Myers

"The thing about this record is that it was their fourth studio album. I can't emphasize enough how marvelous it was to work with guys who had reached that level of feeling so comfortable in the studio that it becomes a playground to them. It was a lot of fun."

Producer/engineer Susan Rogers is heaping praise on Canada's Barenaked Ladies, and the album she's discussing is *Stunt*, the band's U.S. breakthrough release that she co-produced last year with colleague David Leonard. The album has so far notched triple-Platinum sales and counting, mostly on the strength of its irresistible first single, "One Week," a song with rapid-fire rap lyrics that mention everyone from LeAnn Rimes to Akira Kurosawa, as well as many of the favorite foods of its singer and songwriter, Ed Robertson. (Ed likes vanilla, "it's the finest of the flavors," apparently.)

Since their debut album, *Gordon*, was released back in 1992, the five-man Canadian band—which, in addition to vocalist/guitarist Robertson, includes vocalist/guitarist Steven Page, keyboardist/guitarist Kevin Hearn, drummer Tyler Stewart and bassist Jim Creeggan—had been steadily building a small but vocal cult following in America, largely as a result of endless touring. Although they made the occasional dent on radio playlists with



PHOTO: JAY BLAKESBERG

songs such as "Brian Wilson" and "The Old Apartment," the band's fortunes turned in 1996 when, like Cheap Trick, Kiss and Peter Dinklage before them, they recorded and released a live album, *Rock Spectacle*, which was essentially a live "greatest hits" package. When it became their first Gold album (it recently went Platinum), *Rock Spectacle* broadened Barenaked Ladies' U.S. fan base while "warming the bed," as record executives like to say, for their next release. So, upon entering Arlyn Studios in Austin, Texas, early last year, the sharp-dressed men-who-would-be-Ladies were well aware of the high expectations placed on their first studio album in four years.

Although Rogers and Leonard co-produced the album, they didn't actually work together, side by side, during the process. Like so many inventions, their tag-team arrangement was born out of necessity. Approached by the band in December 1997, Rogers had been eager to accept the job but, reluc-

tantly, had to pass on it because of a prior commitment to the group Rusted Root. A full production was not likely, but if they needed any help, she had a three-week window of availability to offer them. A plan was drawn up wherein Rogers would attempt to complete basic tracking, lead vocals and whatever overdubs they could muster in 21 action-packed days. At that point Rogers' associate, David Leonard (the two share management), would finish the job, including the final mix. The team was set.

As 1998 began, Rogers flew to the band's Toronto base for four days of pre-production, during which she made a number of suggestions about rhythms, tempos, arrangements and instrumentation changes. From Toronto, band and producer flew to Austin to begin tracking. Rogers used a mere 24 tracks to record the album on Arlyn Studios' API console, using her favorite tape, Ampex 499 2-inch.

For the most part, Rogers captured the basic tracks

"live-off-the-floor" with all the musicians out in the room together. To ensure that sight lines were unobstructed, the team made good use of Arlyn's three iso booths, employing one for Hearn's grand piano and one each for the band's two lead vocalists.

"But if it was kind of a loud song," Rogers recalls, "we'd go ahead and have the singer out in the room with the drums and just give him a talkback mic to sing into. Tyler's such a loud drummer that we didn't worry about the guide vocal bleeding into the drums."

The fluid and funky bass work of Jim Creeggan is at the core of Barenaked Ladies' sound—an impressive feat considering the lanky redhead's main axe is an electrified double bass, an instrument not associated with precise articulation. "Jim's double-bass sound is so full, with none of the usual clacky characteristics that you find in a lot of double-bass players," Leonard says.

"Jim is something else,"

—CONTINUED ON PAGE 206

# GENESIS' "THE LAMB LIES DOWN ON BROADWAY"

by Tim Morse

It's not surprising that nearly 23 years down the line many people don't realize that Peter Gabriel was once a driving member of Genesis. He was not only the lead singer of the group but one of their primary songwriters. It was Gabriel who pushed the band into the realm of rock theater, stretching boundaries with his multimedia presentations. The Genesis of the early 1970s differed radically from the pop-oriented band that exists today. It was a progressive rock band that explored strangely surreal musical and lyrical frontiers. Their songs were steeped in fantasy and populated with strange characters such as giant hogweed plants, hermaphrodites and aliens from outer space. The music was filled with uncommon chord progressions, odd time signatures and a dramatic implementation of dynamics.



At the heart of this sound was keyboardist Tony Banks, who was responsible for much of the unusual harmonic content in their music and was an early pioneer of both the mellotron and the synthesizer. Although he was classically trained, he was one of the few keyboardists from that era who exercised taste and restraint and played mostly what was necessary for the song. Guitarist Steve Hackett was responsible for creating a haunting, ghostly electric guitar sound that shimmered within the music. He easily shifted from aggressive



Clockwise from lower left: Peter Gabriel, Mike Rutherford, Tony Banks, Steve Hackett and Phil Collins

rock guitar to nimble nylon string classical guitar performances. Michael Rutherford also brought an interesting duality to Genesis with his thunderous bass work and delicate 12-string guitar passages. Rutherford was also an important composer for Genesis, creating many memorable guitar riffs. Drummer Phil Collins was (and is) considered to be one of the finest rock drummers ever (though this has been overshadowed in recent years by his vocally oriented solo pop material). Together these players made music that was cutting-edge and against the grain of commercial rules.

The group began as a pleasant diversion from the private boarding school, Charterhouse, that the founding members were sent to for their high school education. The original group—Gabriel, Banks, Rutherford, Anthony Phillips (guitar) and John Silver (drums)—was actually more of a songwriters collective than a rock band. They recorded demos with the hope of getting other artists to cover their songs, and in the process managed to get a tape to Charterhouse alum Jonathan King, an artist/producer. King was impressed enough to sign the group to a recording contract and christened them with the name Genesis. Their debut album, *From Genesis to Revelation*, was a fairly undistinguished record with amateurish performances; it sold a pitiful 500 copies. After King dropped the band, they decided to do some woodshedding and become professional (at which point Silver left and was replaced

by John Mayhew). Genesis paid their dues playing some of the worst gigs in the UK before they were noticed by Tony Stratton Smith of Charisma Records and signed to that label. Their sophomore effort, *Trespass*, was a dramatic improvement over their first album and contained many hallmarks of the early Genesis sound: Gabriel's strange stories and passionate vocals, Banks' keyboards and passionate vocals, Rutherford and Phillips' lovely 12-string guitars of Rutherford and Phillips. Unfortunately, Phillips had serious health problems around this time (as well as overpowering stage fright) and left the band. Around the same time the decision was made to fire the erratic Mayhew and replace him with Phil Collins. After an exhaustive search, Genesis made Steve Hackett their new guitarist and set about recording their third album, *Nursery Cryme*, which clearly benefited from the presence of the new members.

By 1972 Genesis was finally reaping rewards from years of hard work. Their *Foxtrot* album was released and is now considered to be one of their classic recordings. The band became headliners in Europe and began testing the waters in showcase gigs in America. They were able to capitalize on this momentum with the follow-up album, *Selling England by the Pound*, which featured their first Top 20 single "I Know What I Like." After a hard year of touring to promote the record they agreed to take their first extended break before reconvening to record the next album.



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May 1974 marked the beginning of a very turbulent time for the group. They had all agreed to the idea of a concept album and went through the democratic process of voting on the candidates. Gabriel's idea, which was accepted after much haggling, was *The Lamb Lies Down on Broadway*, which tells the story of Rael, a young punk in New York City who is transformed through a surrealistic series of events and adventures. The story is a multilayered tale filled with allegory and metaphors, but clearly reflects aspects of Gabriel's own life. He has said as much: "I'm sure that my own doubts and searches were built into the story I wrote for Rael." It was agreed that Gabriel would be responsible for all of the lyrics and the companion story since his vision was such a personal one.

Once the concept was agreed upon, the band decided to live together as they wrote the album at Led Zeppelin's infamous home and recording environment, Headley Grange. Unfortunately, by the time the band arrived, the house was in a spectacular state of disrepair. "It had been raped," Collins remembered. "By that time, rats had become the main occupants. You'd walk down the hall and these rats would slowly scurry across the floor. But we spent three months there driving each other crazy."

At this time it was starting to become clear that the band was going through a period of personal and professional difficulties. Gabriel was being lured by William Friedkin, director of *The Exorcist* to write story ideas for his next movie. A film school dropout, Gabriel was intrigued by the offer and saw this as a major opportunity for himself in that industry. However, the band was adamant that he couldn't take a break to work for Friedkin, so Gabriel left the group. Genesis' management intervened and brought him back into the fold, but the seeds of discontent were sown. Hackett recalls, "I think the band was starting to fall out of love with each other. It seemed to be disintegrating and then integrating again. I got the feeling that everything was being held together with cellophane tape. And in some instances it probably was."

Despite their problems, the band found the music for their album was practically writing itself. Quickly it became clear that they had much more material than could fit on a single album and so they decided to make a double LP (thereby doubling Gabriel's workload). Generally the group would write

and rehearse in one room while Peter toiled in another working and revising the lyrics and vocal melodies. After about three months at Headley Grange they regrouped at a farm house in Glossopant, Wales, to record. Producer John Burns was enlisted to work with Genesis on this project, and he is remembered by the band affectionately for being not only a good engineer, producer and musician, but for having a good sense of humor and being able to diffuse potentially lethal situations by saying the right thing in a positive way.

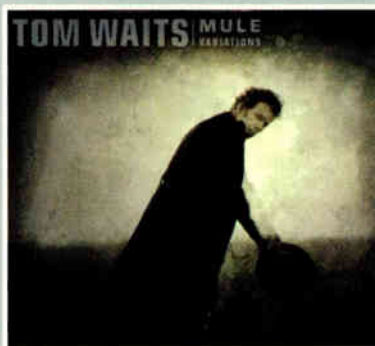
Burns and engineer David Hutchins had set up in Wales with the Island Mobile Studio, and the group managed to record backing tracks in about two weeks. The Mobile was equipped with two 3M 24-track recorders, a Helios 30-input desk, Altec monitors and two A62 Studers for mastering. Although the initial recording went quickly, Gabriel fell behind in his efforts to finish the words and melodies. As he recalled, "I had very arrogantly stuck my neck out and said, 'I've got to write the whole thing,' and then I couldn't do it in time."

## Cool Spins

### The Mix Staff Picks Their Current Favorites

#### Tom Waits: *Mule Variations* (Epitaph)

Admittedly, Waits' music is an acquired taste. The famously gruff vocals are a



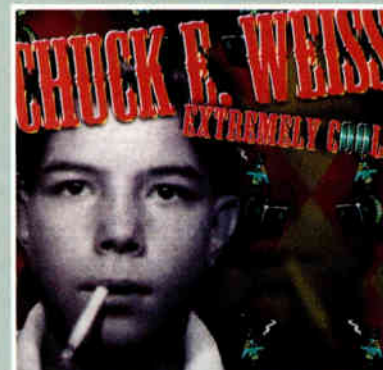
turn-off to some. And on recent albums Waits has often opted for extremely unusual sonics—heavily compressed and/or distorted growls over occasionally bizarre combinations of instruments and rhythmic noises. The first track, "Big In Japan," is a doozy, not for the faint of heart: it combines a seriously altered vocal, what sounds like someone banging on a metal washtub, an angular electric guitar line and Memphis-style horn blasts. But as is always the case with Waits' work, the songs (most of them collaborations with his wife, Kathleen Brennan) are mostly brilliant—the characters vividly drawn, the lyric images haunting and evocative, and the tunes beneath the sometimes ugly exteriors often actually quite pretty. The beautifully atmospheric "Hold On" is as lovely a song as he's ever written (and he's penned some real beauties), and there are a number of other gems on this consistently strong collection of folkish tunes, surprisingly sentimental ballads and

twisted blues: I particularly like "The House Where Nobody Lives," "Pony," "Georgia Lee," "Picture in a Frame" and the hipster poem "What's He Building?" Not for everyone, but a masterpiece nonetheless.

Producers: Tom Waits, Kathleen Brennan; Engineers: Oz Fritz and Jacquire King; Studio: Prairie Sun Recording (Cotati, CA); "Lowside of the Road" recorded by Gene Cornelius at Sputnik Sound; Mastering: Chris Bellman/Bernie Grundman Mastering (LA.) —Blair Jackson

#### Chuck E. Weiss *Extremely Cool* (Slow River/Rykodisc)

The infamous Chuck E. is back with his first full-length album in 18 years. It's earthy, smoky rock 'n' roll and New Orleans R&B, with enough voodoo to conjure Screamin' Jay Hawkins. Weiss has joked that no one with over a third-grade education can play in his band, because his music is so primitive. I don't know what that says about the musicians on



this CD, but they seem perfectly matched to Weiss' hot arrangements, especially the brilliant Tom Waits, who plays guitar and sings on the album in addition to co-producing. Waits and Weiss have had a mutual admiration thing since

—CONTINUED ON PAGE 208



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The title song for *The Lamb Lies Down on Broadway* began its life as a Tony Banks piano piece featuring a classically European stylistic device where both hands play in the same register. Gabriel then created the lyrics and vocal melody for the song, painting the landscape of New York City in words and music. The rest of Genesis added their parts to the arrangement until the piece was complete.

One of the most prominent instruments on the song is Mike Rutherford's bass. He used a Micro Frets six-string bass that he remembered as "one of those basses that has tons of character, but it's difficult to play. Not only did I find that the strings are closer together, but I also found that the scale length was much shorter." He used a Marshall fuzz through an Acoustic amp to give his part that biting edge.

All the guitars were recorded with Shure mics. Hackett played a 1957 Gibson Les Paul through an HH 100-watt amp. To help set the atmosphere of the song in New York, he created the sound of a fly buzzing by hammering notes on the guitar and running DIs into a pair of fuzz boxes. For the haunting obbligato on the bridge, he used a Schaller volume pedal (to clip off the attack of the notes) in conjunction with an Echoplex. Collins used a Gretsch drum kit with a Ludwig snare and Paiste cymbals. The drums were fully miked, and there were also room mics. Tony Banks played an RMI electric piano for the backing tracks and added the grand piano introduction when the band completed the vocals and overdubs later at Island Studios in London. Gabriel's vocals were recorded using a Neumann U47 (a mic he still uses).

The band worked feverishly to get the album completed by the scheduled release date. A European tour was canceled when Hackett injured his left thumb. While he convalesced the band worked night and day mixing the album. Collins recalled, "We ended up back in London doing the vocals and mixing the album in shifts. I'd be mixing and overdubbing all night and then Tony and Mike would come in and remix what I'd done, because I'd lost all semblance of normalcy by that point."

Although the album, *The Lamb Lies Down on Broadway*, was not a tremendous success when originally released (it hit Number 10 in Britain and Number 41 in America), it became perhaps their most respected work and sold steadily for many years as the band became



more popular. Today, the title tune is the only Gabriel-era Genesis that you are likely to hear on the radio. The band went on to perform the whole of *The Lamb* in concert (as The Who did with *Tommy*) 102 times in Europe and America; those shows are fondly remembered by those lucky enough to have attended one. It was also the last opportunity to see Gabriel with the band, because soon afterward he departed the group to begin a solo career. Fortunately, one of the complete shows was documented and is available in the recently released box set *Genesis Archive 1967-75*. ■

—FROM PAGE 196, DOLLY, EMMYLOU & LINDA vocal parts and the instrumentation that would surround them. "On the first record we had some instances where two girls would sing their parts and we'd end up challenged to invent weird parts to make a third part; the second part 'jumped' so much. It would be almost impossible to find a third part."

Since they weren't able to cut the three voices together, Massenburg says, the objective was to make it sound live. Microphone choices assisted in the challenge. "We used several modified U67s with sub-micron Stephen Paul capsules. I used Mastering Lab mic preamplifiers, and GML compressors and equalizers. We did do a little bit of tuning vocals, but only very reluctantly. Where we did it, we did so because we felt it was essential to a beautiful harmony blend."

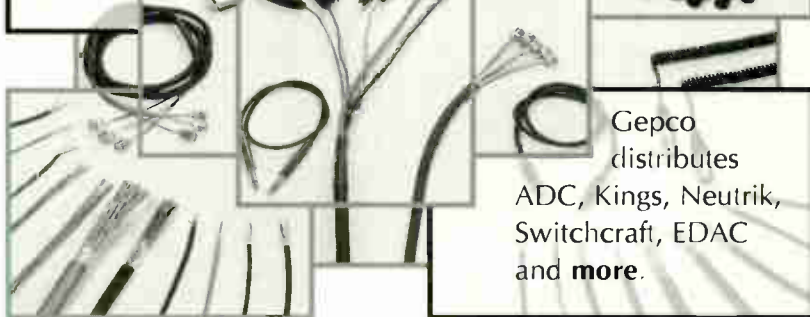
Even being the known perfectionist she is, Ronstadt says she's as much a fan of the Trio's otherworldly vocal blend as the people who buy the records. "It always takes my breath away," she notes. "Me, too," Parton agrees. "It's a thrill. And it's not from any place of an ego thing. I feel humbled to be on it, and when I hear it, I feel so many emotions that I cry."

"What we didn't have were years on the bus and onstage together singing, so we learned to phrase together and anticipate each other's phrasing," Ronstadt says. "That's what took the time in the studio to work out. It doesn't have to be perfectly in tune, but we all have to be singing to the same pitch center. When that happens, it shimmers, and I kept looking for that shimmer."

Though the singers usually have a basic idea where each voice fits in the triad, it is still a process of trial and error on each track. "When we get in the room, we try different configurations to

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figure out what's going to work the best," Harris notes. "There are no rules. It's just, what is the best thing for the song? That even pertains to who should sing lead—the song decides it. We would bring a song in not thinking in terms of, 'Oh, I'm going to sound great singing this.' We were thinking of the Trio. The Trio becomes an entity, and the focus is, 'What facet of the Trio is this song going to bring out? What configuration of voices is going to make this song shimmer?' I'm sure Dolly didn't bring in [Neil Young's] 'After the Gold Rush' with the idea that she was going to sing lead. She just loved the idea of the song. Linda and I felt that Dolly's voice was the one that was going to give it the most spooky quality."

"Linda and Emmy always work so well together that I totally respect what their opinion is on a song, and they know how to use me wisely," Parton adds. "I brought in 'After the Gold Rush' thinking I would be doing the high part because they love to hear my high part."

According to Massenburg, that song presented them with one of their biggest challenges: "We didn't realize it until we had recorded it, but we felt that Neil Young's original lyrics had to change. Everybody has kids, and nobody want-

ed to say 'and I felt like getting high.' 'Felt like eating pie' was one replacement suggestion, but that didn't work out," he says with a laugh. "And the reference to 'in the 1970s' was changed to 'in the 20th century.' We had to do the fixes after we had done the vocals, and matching up vocals like this perfectly is never easy. The other thing about that song was that it was really 'outside.' We hadn't done anything like that before. It's the opposite of a country radio record in every respect."

But the notion of cutting "hits" was not a major factor in this project. From the get-go, they believed the music would probably not be serviced to radio (they turned out to be wrong). "We didn't have a lot of radio support for the first album, either," Ronstadt comments, "but we sold a lot of records, and people found out via word of mouth. And it was the kind of thing where connoisseurs of acoustic music liked where we had taken the tradition. I think when you establish tradition in whatever you do—I call it hooking up to the ancestors—and the music reflects all the people who were responsible for putting you where you were emotionally, culturally and intellectually, the music becomes sacred. The three of us had a lot

of that to offer. Dolly, particularly, focuses it because she is the legitimate Appalachian deal. It's music that Emmy and I both have studied, admired and emulated and done as much as we can to capture, but when we have Dolly there with us it becomes a great big thing because she brings an authenticity to it that is just stunning."

Massenburg says he found the lack of radio concern refreshingly liberating, and the production choices reflect that: "It's not recorded or mixed the same way a radio record would have been. With very beautiful voices, it allowed us to retain the detail. We didn't have to make them too loud or perfectly even. They could breathe a little and retain some degree of life. When you're trying to appeal to radio, you generally compress the hell out of it, and by God, I feel like I'm an expert in that, but here we didn't have to do that. All we had to think about was making a great record with great tunes that would flatter the voices. We didn't find ourselves saying, 'This would sure sound good on radio,' or 'We'd better have an electric bass on this because we want it to read on radio.' We found we made choices for the right reasons."

There was more freedom in the choices in instrumentation as well, and they were able to give the tracks an "old-timey" feel. "What that means is the sounds don't have to be saturated. The sounds don't have to be huge and over-compressed, and the acoustic instruments could be delicate and rather small," Massenburg explains. "We approached the first record in a little more old-timey fashion—we had more dulcimers and David Lindley instruments, but we had our share on this one as well. Sam Bush was supposed to play on the album, but the morning he was to leave Nashville, there was a huge ice storm. He walked out to go catch the plane and fell on the ice and broke his elbow or wrist. We very quickly had to get a stand-in, who was David Grisman. Some stand-in. Among many other strengths, he has the best tremolo in the business. He's a great musician and has a solid sense of that old-timey music."

"One of the reasons I was so anxious for this record to come out was that the players gave their best," Ronstadt says. "We had the best players of acoustic music. There might be others as good, but there aren't any better in the world that you could find. They would give up these beautiful little pearls. There are exquisite little internal harmonies that the

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fiddle player or the mandolin player would play. David Grisman is particularly good at that. He might shadow a line of Emmy's or Dolly's that would be a melody line and nobody really would hear that except us, but it's part of the whole thing. The musicians took care of that music like it is sacred music, and it is sacred music."

Hiring the musicians was one of Massenburg's responsibilities, but he says, "The girls have a very clear idea of what they love, so I'm there to enforce what and whom they choose. If I can help by making suggestions, great, but I'm there to execute what they want. If somebody says, 'That guitar doesn't sound very good,' I fix it, fast. Or if Linda says, 'I want a Rickenbacker'—the old Byrds 12-string, which is an awful piece of junk that cannot be tuned—[guitarist] Dean Parks and I may choose a more modern version that actually can be tuned. Linda wanted that sound, but that's where we might exercise choice.

"Certainly I'm there to book musicians and coordinate schedules, which is a huge job and takes technical, musical and political chops. My role is to do what nobody else wants to do, whatever that is at the time. And I believe that is the main role of a producer. It can be to make clear what someone else can't verbalize, or it may be to order lunch. The producer's job is, and always will be, to clean up the rear. And I'm proud of it," he laughs. "I enhance the artist. And I don't want to leave fingerprints. There are some producers who like to leave a big mark, but I'm the opposite. If I change the sound of an act or an artist, I'm not doing my job."

In this particular case, reassembling the tracks five years after they had been recorded was also part of the job. "We had to find stuff in the warehouses," Ronstadt recalls. "When we took the record apart [both Ronstadt and Parton borrowed tracks for solo projects while the Trio album was dormant] we all changed the harmony parts around so they existed on backup reels, but they weren't in completed forms. We had to find all those reels and reassemble the way the harmonies had been and recombine them. That was a lot of work. Poor George had to track those down. He'd play me stuff over the phone and I'd go, 'No, there used to be a part that would go this way,' and it was hard."

"That happened one or two times where I hadn't identified the right cut and it was clearly something where we had remixed it, so I had to find it," Massenburg says. "It was on Sony 9000

MO discs—unfortunately an obsolete recorder—and we just had to find the right things, but it was pretty well-documented. The most we had to do was editing. We put it in a Sonic Solutions workstation and edited between mixes quite a bit."

Massenburg says, "The track I probably like the best is 'You'll Never Be the Sun.' It's stunningly beautiful, and that happened one morning before Linda got there. Mark Casstevens played a gut solo on it, which he tried to improve, but never could."

"'You'll Never Be the Sun' was the one that really just kept haunting me

during the five-year period," Ronstadt adds, "and also the mandolin harmony David Grisman played on 'When We're Gone, Long Gone.' There were things where I just felt, 'This record has to come out.' The last record the three of us made together and this one are the projects I have participated in that have most fulfilled the goal set. When you set out to make a record, you hope that it's going to satisfy certain aspirations that you have, and these two records really succeeded in what we set out to do. I've made a lot of records where I didn't feel that way. And I probably feel that way the most about the ones that were

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most [commercially] successful. It's like, 'Ughhh, that sucks!' It's really hard for a project to match the dream, but this one did."

"It's a lot easier for me to listen to this record than to my own records," Harris says. "But I like to listen to this, because the Trio is its own entity."

"Listening to mine, I find all kinds of faults and I'm thinking, 'I should have done this, I should have done that,'" Parton notes. "But everything is perfect on these albums. I'm prouder of the Trio albums than anything I've ever done." ■

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—FROM PAGE 197, *BARENAKED LADIES*

seconds Rogers. "He knows the bass so well, but, perhaps more importantly, he also knows what the song needs for bass. He's one of those guys who is great in a supporting role; he can hear the track and know right where he fits in. That's invaluable in the studio and in a band. We needed some string bass on 'When You Dream' and 'Call and Answer,' and Jim would take a cassette of the songs into the next room then come back with four or five parts written. We just set him up and he'd lay down track after track after track of these things."

In addition to the pickups in Creegan's double-bass, Rogers employed a variety of microphones to record his parts. "I used a U47 FET," she reports, "which is always good on bass of any kind, and sometimes a 421. I'd vary the position of them depending on what part of the instrument we needed to pick up, and we would try blending that sound with the pickup signal until we got the right tone."

Because the group's pre-production window was so small, a couple of songs came together once the studio sessions had begun, including "When You Dream," Steven Page's paean to his young son's slumber. The dreamy soundscape that adorns the song began in the studio with a series of loops made from Hearn's samples of air conditioners and motor noises. Page then added some of his own samples of vintage music boxes. Page then sang and played the song on acoustic guitar against the looped backdrop.

In the case of "Some Fantastic," "Ed had an idea for wanting to do it with a Brazilian rhythm," Rogers recalls. "We started by sending Ed and Tyler out in the parking lot with these snare drums around their necks. It goes without say-

ing that a snare drum is a really loud instrument, but you notice it even more when it's outdoors because the sound really travels. So we had to put a couple of towels over each snare, which actually made them sound better. They played the whole song, five minutes or something, until the neighbors complained. Then we brought them back into the studio and added the other instrumentation."

Speaking of disturbing the peace, the boisterous choruses, crunchy guitars and crashing drums of "One Week" sur-

**My main contribution  
was to put  
more noise and grit  
into the tracks  
and to mix it  
with that edge.**

**—David Leonard**

prised many of the Barenaked Ladies' longtime fans—and the bandmembers themselves: It was cast as a small acoustic number on their original demo.

"It was played on acoustic guitar with a small drum sound, and it was really appealing that way," Rogers says. "After we had cut the basic track and started treating it, we wanted to have just a bit of electric guitar here and there. Kevin and Ed both came up with some great electric guitar hooks, and we put on a few different tracks just to incorporate all of that. Then I had an idea that I wanted a very big sound coming from a very small sound source. Tim Blunt, one of their guitar techs, had one of those tiny Marshall amps, about four or five inches high, so we set that on a chair, put an SM57 in front of it and Ed plugged in his guitar and just played. The idea was to sound as if it was a guy in his room—it could be a guy who couldn't actually play, playing along with the record. We had a few of those little licks—very tiny but very, very distorted—on there. Mainly, they were just decorative."

After completing all the band tracks for that song and most of the lead vocals, Rogers handed off the tapes to coproducer David Leonard, who beefed up the tracks during a whirlwind two-week period at Phase One in Toronto.

Rogers points to Leonard's layering expertise, in particular his knowledge of what she refers to as "heavy, distorted, electric guitar" sounds, for the song's final heaviness.

"My main contribution," Leonard says, "was to put more noise and grit into the tracks and to mix it with that edge. There's a lot of levity in their music, so I thought to put a bit of angst into the tones would be a good combination to give it some bite."

Making extensive use of Phase One's customized Neve 8060 console, Leonard overdubbed what he calls the "colors and sprinkles." He added backing vocals, lots of percussion and assorted synthesizers and, of course, all of those big electric guitars.

The final stage in the album's evolution began when Leonard took the tapes to mix at East Iris Studios in Nashville, a studio Leonard favors for many reasons, but mainly because of its SSL J 9000 console. "I'm addicted to the J Series," Leonard says. "The greatest thing about East Iris is that when you're in the control room mixing and then take it to your car or your home, there are absolutely no surprises. It never changes; it sounds exactly like what you're hearing at the mix."

For processing on the mixes, Leonard used a few of his preferred pieces of equipment, including his current favorite, the SansAmp. "On 'One Week,' I ran Ed's voice through it to give it more edge and bite, and I love them on percussion, too. I'll often re-amp the bass guitar using the clean setting of the SansAmp. It makes a nice amp simulator that doesn't have any phase shift like a real amp would. And on the drums I always go for that boinky snare, probably left over from the Mellencamp days with Kenny Aronoff. I'll put the snare through an API 525 compressor; it really just grabs that sound and pulls it out."

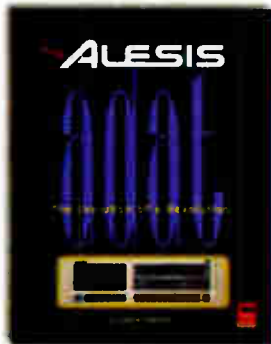
During a mix, Leonard often employs sidechains to handle what he refers to as "frequency dependent" compression demands. "I probably have a dozen sidechains on every mix, which I think is more than a lot of other people," he says. "I'll take a mult of the sound source that has the aggravated characteristics that I want to compress and then drive that into the detector on the compressor. That way, the compressor is only reacting to the part of the sound that you least like without robbing the fullness of the other sounds that you do like. As I plug up the sounds in a mix, I will mult a num-



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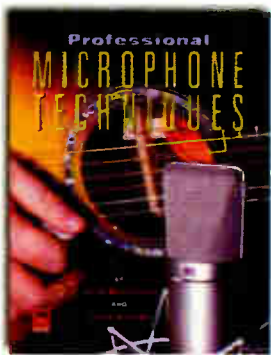
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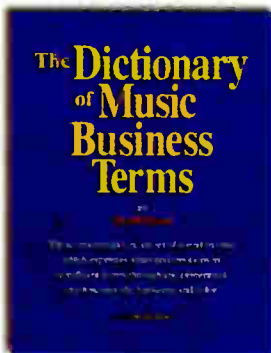
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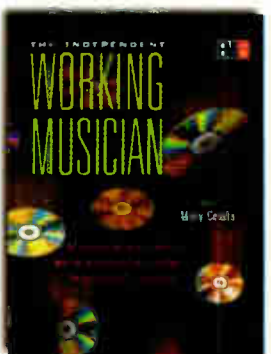
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ber of the sounds over to the little faders on the right hand side of the board and use those equalizers. I'll typically run the whole right side of the board as mults of guitars and over-heads and voices."

With their first Number One hit single, first Platinum album and their first Grammy nomination, it's been a year of firsts for the Barenaked Ladies. Coincidentally, *Stunt* is also the first Barenaked Ladies studio album to feature the prolific input of Kevin Hearn, who had replaced original member Andy Creeggan after the sessions for the third BNL album, *Born on a Pirate Ship*, and had previously only appeared on the live album. "Kevin is just phenomenal," says Leonard. "He has a lot of clever little sparkles and ear candy and things that really make a mix fun. He did some wonderful work on sounds with keyboards, but also with guitars. He's got a whole sampler full of crazy little home-made things."

And Robertson, who co-founded Barenaked Ladies with Page while the pair were at summer music camp over a decade ago, is the first to credit Hearn as a "major influence," not only on the album but on the band as a whole. "For the first time," he says, "it was Kevin's chance to really put his fingerprint on the band, and we couldn't be happier with the way it all turned out." More than 2 million BNL fans would probably agree. ■

—FROM PAGE 200, COOL SPINS

they were sharing a stage in L.A. 20 years ago, and *Extremely Cool* shows where the two artists still meet—in these powerful, thumping jungle drums, nightclub pianos, crunchy guitars and prophetic voices.

Producers: Tony Gilkyson, Tom Waits, George Howard, Mike Hutchinson and Chuck E. Weiss. Engineer: Mike Hutchinson. Studio: John Herron's. Mastering: Jeff Lip-ton/Peerless. —Barbara Schultz

**Faith Evans: *Keep The Faith* (Bad Boy)**

With the crossover popularity of female R&B/hip hop artists such as Toni Braxton, Mary J. Blige and more recently, Lauryn Hill, the genre has taken a strong turn toward melody. Formerly married to the late Christopher Wallace (better known as the Notorious B.I.G.), Evans has made a disc that shines with Biggy's grooves and her own gorgeous vocal arrangements, aided by a number of top-notch producers and engineers. Her range is especially impressive on the dance-y "Love Like This" and the memorable



"Caramel Kisses." Puff Daddy lends his voice on "All Night Long," but it is the beautifully textured and tastefully arranged ballads—notably the infectious "My First Love"—that are the real standouts. It's difficult to compare Evans to other R&B contemporaries because she has truly created her own sound, which will no doubt inspire others. A great pick for anyone who appreciates melodic and harmonic symmetry, regardless of genre.

Producers: Sean "Puffy" Combs, Ron "Amen-ra" Lawrence, J-Dub, Carl "Chucky" Thompson, Richard "Younglord" Frierson, Steven "Stevie J." Jordan, Dent (one song), David Foster (one song). Recording engineers: Joe Perra, "Prince Charles" Alexander, Tony Smalios, Tom Russo, Alex Niehaus, Doug Wison, Rob Paustian, Tom Cassel, Paul Boutin (one song), Tony Black (one song). Mixing Engineers: Tony Maserati, Niehaus, Michael Patterson, Alexander, Jon Gass, E'lyk, Black, Jordan. Recording Studios: Hit Factory (NYC), Larrabee West (L.A.), Daddy's House (NYC), Sony Music (NYC), Record Plant (NYC), Brandon's Way (L.A.). Mastering: Herb Powers/Powers Sound (NYC) —Jason Perl

**Polaris: *Music From The Adventures of Pete & Pete* (Mezzotint)**

Since first appearing with his band Miracle Legion in the '80s, Mark Mulcahy has made consistently luminous, stirring guitar rock. On this new release, Mulcahy teams with the rhythm section from the last incarnation of Miracle Legion (who, these days, perform

with Frank Black) under the name Polaris. The band appeared as fictional characters in the late, lamented Nickelodeon series *The Adventures of Pete & Pete*, and they recorded these Mulcahy-penned tunes over three years for the three seasons of the show. Despite the fictional guise, there's no mistaking the provenance of these songs: Mulcahy's warm, inviting voice has a strangely beguiling presence and power, and he sounds as good as ever here, while the music (at turns quiet and wistful or driving and ebullient) is soulful in an off-hand way. Loaded with surprising, beautiful moments.

Producers/Engineers: Drew Waters, Tom Buckland. Studios: Mill Rat (Providence, RI), 1313 (Cleveland). Mastering: Allied Digital Technologies (Long Island, NY)

—Adam Beyda

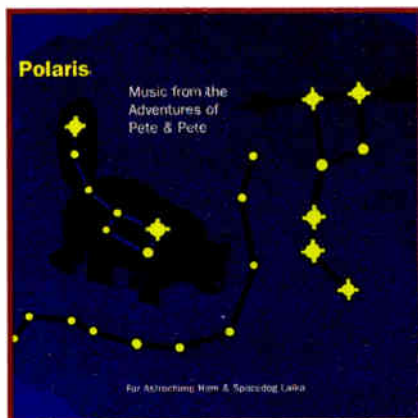
**Rosie Flores: *Dance Hall Dreams* (Rounder)**

Some artists do it for love. Thank goodness, too, because otherwise talented singer/songwriter Rosie Flores might not still be making beautiful music. Though Flores has never received a whole lot of recognition, she continues to make her sparkling country/Tex-Mex albums, each more enjoyable than the last. This latest release is more singer/songwriterly than Flores' last solo release, *Rockabilly Filly*, though there's still a good dose of honky-tonk. Standouts are the first track, "Little Bit More," and "Bring It On." There are also several ballads, where lyrics and arrangements are more earnest, but in Flores' capable guitar-wielding hands, and thanks to her adorable voice, even the most strident compositions sound genuinely sweet.

Producers: Rosie Flores and Ray Kennedy. Engineer: Frank Campbell. Overdub recording: Rosie Flores and Ray Kennedy. Mixing: Ray Kennedy. Studios: Recorded at Cibolo Creek Country Club (San Antonio, TX); overdubs and mixing at Room & Board Studios (Nashville). Mastering: Hank Williams/Masternix (Nashville). —Barbara Schultz

**Ginuwine: *100% Ginuwine* (Sony/Epic)**

In the sometimes cookie-cutter world of R&B, it's nice to see acts that have unique recipes, master chefs at work and the talent to create their own name and style. To the innovator's list we should add Ginuwine and his latest CD release. From party grooves to slow ballads, *100%* covers a gamut of styles. The CD's sound is marked by soothing, soulful vocals that flow easily over varied instrumental backdrops consisting of some unique drum patterns, live guitars and even some retro keyboard sounds (clavinet and Mini-moogs). "Do You Remember" takes the listener on a lover's journey, while "So Anxious" paints a picture of some very different emotions. And on "Same Ol' G," Ginuwine talks about staying grounded in the face of his new celebrity.



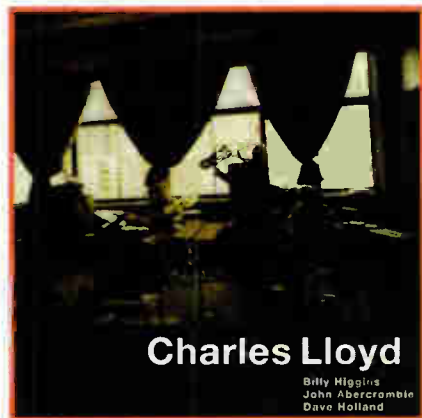




The production of Timbaland and mixing by Jimmy Douglas: create a nice, complementary balance between the vocal and instrumental parts. This sophomore release should go far in building his already large following.

Producer: Timbaland. Engineer/mixer: Jimmy "Senator" Douglas. Studio: Manhattan Center Studios (NYC). —Mark Hopkins

**Charles Lloyd: *Voice In the Night* (ECM)**  
Here's an all-star band that really delivers—tenor saxophonist Lloyd fronting the ever-imaginative double-bassist Dave Holland, nimble drummer Billy Higgins and ECM guitar stalwart John Abercrombie. The disc covers a nice range of styles, from boppish inventions ("Homage") to playful takes on the blues ("Pocketful of Blues"), a dash of Latin flavoring ("Dorotea's Studio") and the quartet's ethereal rendering of Billy Strayhorn's "A Flower Is a Lovable Thing." There's a new reading of



**Charles Lloyd**

Billy Higgins  
John Abercrombie  
Dave Holland

one of Lloyd's most famous compositions from the '60s, the multipart "Forest Flower: Sunrise/Sunset," and even a version of "God Give Me Strength" by Burt Bacharach and Elvis Costello. Abercrombie's silvery guitar lines mesh wonderfully with Lloyd's earthy and sensual tone throughout this live-in-the-studio date. The tunes are warm and melody-rich, the atmosphere pleasingly casual. Pass the snifter of cognac, please.

Producer: Manfred Eicher. Engineer: James Farber. Studio: Avatar (NYC)

—Blair Jackson

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# COAST TO



Richard Thompson (R), with producers Rob Schnapf (L) and Tom Rothrock

## L.A. GRAPEVINE

by Maureen Droney

Dropped in at Sunset Sound's Studio One, where I found songwriter/guitarist Richard Thompson in mixing his upcoming Capitol release with producers Tom Rothrock and Rob Schnapf. Rothrock/Schnapf, perhaps best known for their cutting-edge work with artists such as Beck, Elliott Smith and Foo Fighters, have their own independent label (Bong Load) and were hooked up with Thompson by Capitol A&R exec Kim Buie, who had long thought that the three would make a good team.

"I've been a big fan of Richard's since '81 or so," says Schnapf, "and I was always very interested in doing something with him. Kim has been trying to get us together for about five years, and finally the time was right."

"It was a bit like a job interview when we met at my house," recalls Thompson with a laugh. "Although I guess it was more like, 'Who's interviewing who?' I thought it was great that there were two of them. I knew if I had a falling out with one, there was always another I could work with! It's turned out very well. We made the record I wanted to make, without trying too hard. It was fun, and comparatively easy to record. We got really lucky with the musicians—I don't have a regular band; it's more of an irregular band, and this was it. We had [drummer and Fairport Convention alumnus] Dave Maddox and [upright bassist/ex-Pentangle member] Danny Thompson, with Atom Ellis from the [Bong Load-signed] band Dieselhed on electric bass. That's the core—and my son Teddy Thompson sang and

—CONTINUED ON PAGE 212

## NY METRO REPORT

by Gary Eskow

Vintage analog continues to be in high demand in New York, but savvy clients are also looking to integrate the sound of classic Roland synths and Ampeg bass amps with the control and possibilities afforded by a hard disk recording environment. New studio Stratosphere Sound is emblematic of this development, offering an A room that centers around a classic Neve 8068 console and a fully loaded Pro Tools

Stratosphere partners (from rear) Andy Chase, James Iha and Adam Schlesinger

Mix Plus system.

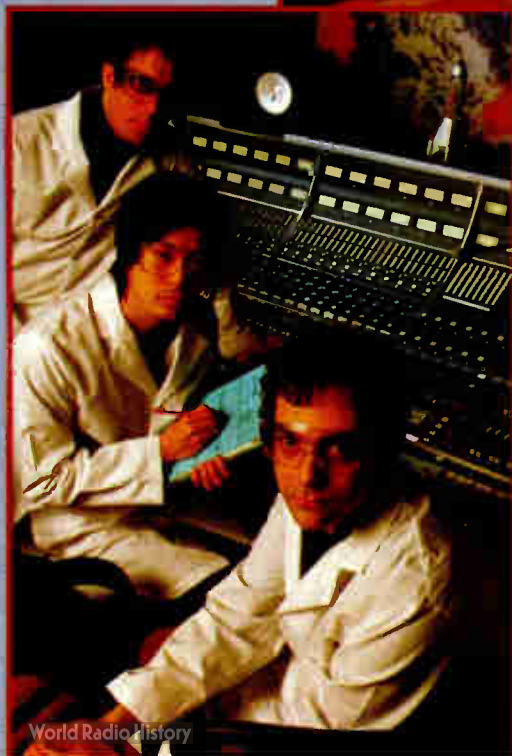
Stratosphere partners include Smashing Pumpkins guitarist James Iha, engineer/mixer/producer Andy Chase, and Adam Schlesinger, whose title song from the Tom Hanks film *That Thing You Do* earned him an Oscar nomination. Located in the meat packing center near the Village, Stratosphere is large and homelike. It feels like your first apartment might have if a cleaning crew came by every other day or so.

"The studio has a

really relaxed, comfortable feel to it," Schlesinger says. "It's like recording in your living room—that is, if you happen to have a vintage Neve in your living room. The place developed in a very organic way. I write and produce, and I play bass and guitar in two bands—Ivy and Fountains of Wayne—and I live very nearby. Originally, the space was where my bands worked out ideas. As time went on, we began talking with the previous owners and eventually decided to



PHOTOS: LEO SOBEL



take it over." (Smashing Pumpkins band members reside and record most of their tracks in the Chicago area, but Iha spends a lot of time in New York, and he wanted to establish a musical home here, especially for the projects he develops on his own.)

Engineering consultant John Klett was putting the final touches on Stratosphere's 8068 when I met with him. "I remember when this board first went into

—CONTINUED ON PAGE 214



# COAST

## NASHVILLE SKYLINE

by Dan Daley

To recap our story so far: Nashville's studio community found itself caught up in the throes of a long-awaited consolidation. Emerald Recording, flexing some pent-up financial resources, bought Masterfonics out of bankruptcy: Seventeen Grand expanded by acquiring mid-sized facility Love Shack. And both facilities made it clear they were still hungry, which caused several other facilities around Music Row to spruce up the grounds and clear up their dance cards. Meanwhile, Sixteenth Avenue Sound quietly closed, as did October Studios and a few other supporting players. On other fronts, country record labels and music publishers were doing a similar dance, with Sony/Tree handing out pink slips to writers (who burn up a lot of studio time on demos). MCA Records—now owned by a Canadian liquor manufacturer—folded the Decca label, the first high-profile closing of this year (last year saw at least three other labels—including Almo Sounds and Rising Tide—close). Then there is the sub-plot in which Christian labels, whose business has

been based till now in Nashville, balked at resigning musicians union pension and welfare agreements, with murmurs that other cities have studios and musicians, too.

Cue the organ, break for a soap commercial.

Nashville remains in motion. It's a city where everyone seems to know everyone else's business, and the gin-soaked Greek Chorus chronicles and laments every new episode nightly down at the Sunset Grill—where *schadenfreude* is a cocktail as well as a concept. Everyone has an opinion as to what's going on and what the next plot twists might be, but unlike most soap operas, there's little in the way of consensus.

"I think what we'd been hoping for a long time is finally starting to happen," says Brett Blandon, manager at Ocean Way Nashville and one of the optimists. "The labels in L.A. and New York are starting to view Nashville as a kind of retreat, where their artists can make great records for competitive prices without the pressures of those cities." Blandon cites an increase in major-label pop, R&B and rap records being made in Nashville, as well as the realization by labels' country divisions that the pop market offers revenue pos-

—CONTINUED ON PAGE 214



PHOTO: MICHAEL PASTERNO

Jazz pianist Bob James (R) recorded his most recent release, *Playin' Hooky*, at his Westchester County, N.Y., home studio, which is equipped with a Sony 3324S 24-track, Opcode Studio Vision Pro, Pro Tools 24 and a linked pair of Yamaha O2R consoles. Outboard includes Drawmer compressors, Pultec EQs and SPX90s. With James at the O2Rs is his engineer, Ken Freeman.

## SESSIONS & STUDIO NEWS

### SOUTHERN CALIFORNIA

At The Dog Bone (producer Pete Anderson's facility in Burbank), Dwight Yoakam recorded two new tracks for his greatest hits package, due out in the fall on Reprise, and Scott Joss cut his second release for Little Dog Records... Sony/Clockwork Entertainment artist T.Q. mixed the track "Summertime" with engineer Rob Chiarelli and assistant Jeff Gregory at The Enterprise (Burbank)... Actor John Lithgow worked on a new swing-influenced children's album for Sony Wonder titled *Singin' in the Bathtub* in Studio D at The Village Recorder (West L.A.), with producer (and jazz keyboardist) Jai Winding and engineer Ted Blaisdell...

### NORTHEAST

Dream Theatre tracked

for a self-produced Elektra/EastWest release with engineer Doug Oberkircher and assistants Steve Regina and Bryan Quackenbush at Bear Tracks Recording (Suffern, NY)... At Indre Studios in Philadelphia, Relpase Records artists Brutal Truth mixed an album (recorded live in Australia) with engineer Michael Comstock, and David E. Williams recorded a new EP for indie label Ospedale Records... Sevendust recorded for their nextTVT Records release (due out this summer) with producers Toby Wright and Jay Jay French at Longview Farm Studios (North Brookfield, MA)...

### NORTHWEST

The Climax Golden Twins completed a new CD for Japanese label Meme at Seattle's Gravelvoice Studios with co-producer/engineer Scott Colburn... Fuse recorded for their debut at Studio D Recording (Sausalito, CA) with studio co-owner Joel Jaffe produc-

ing and engineering. The studio recently purchased an Amek 9098I console, an ADAT M20 and a Sony CD burner... At Hanzsek Audio (Seattle) Scott Ross engineered piano recordings for retailer Nordstroms... Quasi, Satan's Pilgrims and Sarah Dougher were some of the recent acts in at Jackpot! Recording (Portland, OR), working with engineer Larry Crane. Also in were Jr. High, recording their second CD with producer/engineer Joanna Bolme... Seattle-based producer/engineer Tucker Martine has been working on releases for the Gully Jumpers, Jana McCall (for Up Records) and Julian Priester... Hollywood Records artists Leftover Salmon overdubbed for an upcoming release at Colorado Sound (Westminster, CO) with producer Randy Scruggs, engineer James Tuttle and assistant Lorne Bregizer...

### SOUTHEAST

Tree Sound Studios (At-

—CONTINUED ON PAGE 216

—FROM PAGE 210, L.A. GRAPEVINE played guitar, as well.”

Recorded at Capitol's Studio B over a three-week period and titled *Mock Tudor*, the CD is scheduled for a June release. Although not, according to Thompson, a “theme record” per se, the album does have a leitmotif: It was inspired by his recollections of growing up and living in '60s to '80s London—hence, the title, from the architectural style of the row houses that dominated his neighborhood. “It's not actually about nostalgia,” he says. “It's more about the things that drive you, the things that, years later, can still sometimes make you wake at night in a sweat.”

Rothrock and Schnapf are frequent denizens of Sunset Sound. “We like Sunset Sound because we like the vintage stuff,” Rothrock says. “The consoles, the couches...and we like API consoles a lot. They're American and they don't break much. It's kind of like driving an old Ford vs. other vintage consoles that are more like old MGs.”

The duo also work on an API DeMedio console at their private studio in Northern California, where Rothrock, who attended Humboldt State University, hails from. “It's kind of a retreat studio,” he says. “We usually do a lot of work up there in the summer when it gets hot and smoggy in L.A.” The idyllic-sounding and “state-of-the-art '70s” facility also features a Stephens 24-track. “We try not to be up there in the winter because it's just mud,” Schnapf adds. “It's in a barn with lots of windows and natural light, on a river, in the redwoods by the ocean...”

The two do their own engineering, trading off chores as needed. “Rob and I both have engineering backgrounds,” Rothrock explains, “so there aren't really defined roles, just a way of working. We've been working together, kind of exclusively, for ten years, so I'd say we have a routine. [“Although it's sometimes hard to figure out what it is,” says Thompson.] A lot of times it's not discussed. One of us will be running the tape machine and get up and move to the other side of the room. The other person will walk by, sit down and start running the tape machine. There's a lot of back and forth that's just understood. We're definitely not haphazard, though, and it's not a happy-go-lucky free-for-all. There are defined areas of responsibility, but there's not a defined way things have to go down. You can be flexible while still being in charge.”

Rothrock and Schnapf's association began when both were working at Re-

cord Plant. Rothrock had dropped out of college with the goal of finding work at a studio; Schnapf had arrived in L.A. from Washington, D.C., with his band, and when the band broke up, he also decided on a studio career. “We both ended up working at Record Plant on Sycamore within a year of arriving in L.A.,” Schnapf says, “not as assistants—they wouldn't let us be assistants. We were making coffee and sweeping up. The good thing about Record Plant at the time was it had Stage M, the scoring stage, and a remote truck, so we both gained invaluable, all-around experience.”

How did the two start working together? “It was Christmas Day 1988, and I'd just finished producing a little five-song indie recording that I'd been doing on the side at Cherokee Studios,”

(seemingly not so prevalent these days) of bringing in bands to record on off-time. “There was a space above the main Record Plant called Microplant, run by Steve Deutsch, who would let us work in there anytime it wasn't booked,” Schnapf explains. “We'd drag bands in, and we started amassing all this material. We were producing, but it was always considered just demos, until we got sick of that. No one would put the music out, and Tom had always wanted to have a label, so that was the launching ground, the birth of Bong Load.”

With Beck's smash hit “Loser” to their credit (Beck was signed to Bong Load prior to being picked up by Geffen, and “Loser” was a Rothrock/Schnapf production), one would expect that the team would have it made. “It was interesting,” muses Schnapf, “the *Mellow*



At The RecRoom (L to R): Giorgio Bertuccelli, Michael Skloff, Greg Bissonette, Doug Rider, Rocket Ritchotte and Matt Bissonette

Rothrock recalls. “Record Plant had a tradition that there was at least one staff member there 24/7, and that Christmas I was the guy. Rob dropped by to see what poor schmo was stuck there, found nobody at the front desk and me in a studio with two DAT machines dubbing this EP. I had headphones on and he kind of scared me when he said, ‘What are you doing?’ ‘I'm dubbing this thing I just produced,’ and it was like ‘What? You're the janitor—how did you produce something?’ ‘Well, I met these guys who had a band, and I told them I knew how to record.’ He listened and said, ‘This is the kind of stuff I'd like to produce!’ So I said, ‘Well, I've got time upstairs at Microplant, and my roommate's got a band...’ You can't be too fussy in the beginning. If a band has some good quality about them and there's something you think you can bring to it...”

The two continued honing their chops in that classic studio tradition

*Gold* experience. It was kind of a weird record, so it's not like our phone was ringing off the hook. It was an idiosyncratic record at the time—it still is, actually—or, well, it's just Beck. But at the time I think it confused some people. It didn't fit into column A or B, and people couldn't really recognize a thumbprint of ours. A lot of producers have that kind of style imprint, but our whole thing is to try to maximize what the artist does, and I think that can be hard for some people to get.”

“When we're looking for stuff to work on,” Rothrock says, “we pay most attention to the songs. That's why we can go from Elliott Smith to Richard Thompson to Moby, and hop around genres, because we really are just looking at the songs each time—the songs and the task at hand. We've been lucky, if that's the right word; you meet a lot of people who want to be working in the opposite genre from what they're already doing, and we've been



able to avoid that. Maybe having our own label helps, and also the fact that we'll work on something at any level keeps us from getting pigeon-holed."

The duo definitely still enjoys getting in on the ground floor with artists. "That's the fun part," Schnapf comments. "It's cool to be able to find something early on and get to maximize the good things about it before all those other agendas start to happen. It's like you're in it for the right reason, just for the music."

Working with a seasoned artist like Richard Thompson gave some different perspectives. "We've worked with a lot of young bands," Schnapf says, "and a lot of them could learn from Richard. He's a master of the craft of songwriting, and he has a great work ethic. The process was very streamlined; it was get in there and work, work, work—have a good time, but always be productive. Then you take a break, then you work some more, and when you're no longer productive, you go home. As opposed to people farting around all day and just wasting time."

Upcoming Rothrock/Schnapf projects to look for besides *Mock Tudor* include Moby's new release (featuring some vocal cameos from No Doubt's Gwen Stefani), and an album by Sony 550's buzz artist Carl Hancock Rux.

In a very convenient Beverly Hills-adjacent location I found The RecRoom, where partners Michael Skloff and Giorgio Bertuccelli were laying down cues for the *Friends* television series soundtrack. Composer/keyboardist Skloff and producer Bertuccelli are a busy team; they also score for two other top NBC sitcoms, *Veronica's Closet* and *Jesse*, as well as doing work for film soundtracks and TV movies.

The RecRoom complex is utilitarian and comfortable—an industrial-style space with concrete floors, exposed ventilation ducts and plenty of translucent-shaded natural light, with walls a combination of plywood and some rather indescribably avant colors (although the amiable Bertuccelli made a search for paint cans to pinpoint an accurate name for a certain green I was curious about). The control room features a Vincent Van Haaff/Waterland Front Wall room-within-a-room construction surrounding a Euphonix CS2000/3000 console (2000 frame, 3000 electronics). On the day that I visited, engineer Doug Rider was recording direct to Pro Tools the regular *Friends* band—Rocket Ritchotte on guitar and Greg Bissonette on drums, with brother Matt Bissonette on bass and Skloff on

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piano. This rather amazing collection of studio cats routinely lays down 30 to 40 cues in a seemingly laid-back three-hour weekly session and has a good time to boot. These guys make it look effortless!

Skloff spent ten years in New York working in musical theater, while Bertuccelli was producing and engineering, working with synthesizers and bands. They met when Skloff came to Bertuccelli's studio in Hollywood's historic Taft Building to record some songs from a live performance he was working on. "The project never came to fruition, but Giorgio and I just sort of stuck together and started doing a lot of stuff together," he says.

"I'm self-taught and Michael went to Carnegie Mellon for composition," says Bertuccelli. "That's kind of what we offer each other."

The RecRoom is a relatively new space; the studio design came about in part because Waterland Design's offices were beneath those of Bertuccelli's studio in the Taft Building. "After we started doing *Friends* about five years ago, we jumped around a lot from studio to studio," Bertuccelli says. "Finally, it was time to get our own space. When we first talked to Vincent, the original drawings were of a conventional room. He had a 3D rendering on his desk of the Front Wall, and we said, 'Hey what's that?' We like having open spaces."

"It's a lot bigger and more fun; that's why we call it the RecRoom," adds Skloff. "It's great not to have so much separation between people. It's the best of both worlds—we have this great sort of experimental open space and the three isolation booths that keep us safe when we need to keep tracks separate. There are mic panels in all the rooms [a drum kit is also set up in the high-ceilinged lounge] with video link in all those panels, so we can potentially record an orchestra here when we need to."

Although Bertuccelli and Skloff have for the past few years been concentrating on their highly successful soundtrack career, they are also branching out—a recent session at the RecRoom consisted of three days with Phil Ramone working on Barry Manilow's version of "Strangers in the Night," and the two have been recording material for artists that will be released on their own imprint. You'd think they'd be too busy, but, you know that old saying: "If you want something done, give it to a busy person to do." ■

Got L.A. news? Fax Los Angeles editor Maureen Droney at 818/346-3062 or e-mail [mismk@aol.com](mailto:mismk@aol.com).

—FROM PAGE 210, NY METRO REPORT

White Crow up in Burlington, Vermont." Klett says. "They did a number of good upgrades to it, including group muting, a redesigned monitor panel and associated 'communications' rack. The monitor-communications upgrade gives the console a more flexible cue system and adds bidirectional and simultaneous communications like the V3 and VR consoles have. The producer can lean on the button and carry on a two-way conversation.

"At some point the board made its way to Sweetfish, a recording studio up in Argyle, New York," Klett continues. "At Sweetfish the original Neve patchfield was retrofitted with nine new nickel-plated bantam bays made by Manhattan Audio Consultants. That was maybe three years ago. Sweetfish wanted to scale back, and they sold the console to Stratosphere at the end of December 1998. The board has GML moving fader automation—GML has the VME cards now and is going over them for us. This board is set up with the latest software and a Mac front-end for those who don't like the old command line interface. There are four wild faders for grouping, and all the faders are being cleaned and lubed.

"By the time your article goes to print the console will be completely recapped using high-quality, low-impedance parts," Klett says. "These are actually superior in some respects to the original parts. We are checking every amplifier for distortion and bias. All the switches are being cleaned, reconditioned and lubricated. Whatever switches, pots, etc. don't clean up will be replaced—the console will be in tip-top shape."

Being able to work regularly on an 8068 was a dream come true for Schlesinger. "This is really my fantasy console. We had an Allen & Heath board previously, and I enjoyed that board as well, but the Neve is a huge step forward. When we were mixing our last Fountains of Wayne record in Boston, we worked on an 8068, and I fell in love with it." Schlesinger's other band, Ivy (in which Chase also plays), recently finished work on *Utopia Parkway*, their second Atlantic album, which should be released in the near future. (To date, Ivy's best known track is "This Is the Day," which received a boost when it was used in the film *There's Something About Mary*.)

Everyone makes mistakes. If you sold your Roland Juno 60 synth, don't feel bad; so did I. I can't help but wonder if Stratosphere's Juno 60 once sat in my studio. Schlesinger laughs. "Anyone who has heard 'That Thing You Do'

knows that I have a real affinity for '60s music. I also love the early '80s synths and effects from that era. We have an Arp Omni II, a Moog Prodigy, a Farfisa Syntheslalom, as well as things like a Roland Space Echo hanging around. And no digital guitar amp simulator competes with the vintage Marshal JMP 50W, or the Silvertone Twin Twelve and Ampeg B-15 Protaflex amps we use when we want that authentic tube amp sound." The early century 9-foot Steinway also makes an impression.

Schlesinger knows that tripping down nostalgia lane could lead to limited bookings if this equipment freezes out modern technology. "Integrating the vintage gear with Pro Tools is a key to what we're doing here. I've used Pro Tools to track, fly vocals around to create arrangements, and automate mixes, and it's a tremendous workstation. We're upgrading to a Mix Plus system, and it will sit right by the console. Of course, there are always going to be clients who want to stay 2-inch throughout a project, and we can accommodate them as well, since we have an Otari MTR-90 II."

Staff engineer Geoff Sanoff's resume includes a stint at Sony Records. He says that the feel of Stratosphere fits his working style. "They make great records at Sony, but the corporate environment isn't for me. There, every project has to be seen in terms of how many dollars it can generate. That's fine—I respect the fact that it has to be that way. Down here we work differently. Like Adam says, we have a family atmosphere going. We're offering our clients the best combination of analog and digital technologies, but in a looser, more relaxed setting. Our connection to the Pumpkins opens up doors that could one day be very exciting." ■

E-mail your New York news to New York editor Gary Iskow at [scribeny@aol.com](mailto:scribeny@aol.com).

—FROM PAGE 211, NASHVILLE SKYLINE

sibilities that country's current tailspin doesn't. Blandon mentions the pop success and Grammy nominations of Faith Hill's "This Kiss," and producer Hugh Padgham's work with Kami Lyle in 1998 as examples of this trend. However, Blandon concedes, projects and producers like that may have been "a year too soon" for Nashville to appreciate what they can do for the studio base here. "There's a kind of maturity that's being forced upon Nashville at the moment," he continues. "We're in a zone in between the original good ol' boy way of doing



things and the cutting edge. Nashville's finally becoming accepting of change, if for no other reason than it has to."

Josef Nuyens, owner of the Castle Studios, is less sanguine. "I don't think anything's going to really change in the end," he says, "at least not as far as studio revenues are concerned. My long-term prediction is that many of the studios that are growing by consolidation now are going to break apart five years down the line because they won't be able to carry the weight that the cost of these new acquisitions brings with them."

The same day we spoke, the Bloomberg wire carried the news that insurance giants Aegon and Transamerica had merged, and the markets reacted positively based on the notion that insurance companies, which also operate under heavy profit margin pressures, can better withstand those pressures as larger entities. Does the same apply to recording studios? "No," says Nuyens, who also has an investment business. "Insurance companies are buying capital assets that they can put into mutual funds and make dividends on. Recording studios that buy other recording studios are buying devaluating assets, particularly if they're just buying equipment and not the real estate." Nuyens' response, aside from noting that the Castle's 35 acres continue to appreciate thanks to real estate development nearby, is to diversify: the studio recently created a joint co-publishing deal with Warner Chappell Music and is starting up an online music retailing operation called tappedinto.com. "You can keep your studio running, but you need other sources that can return profits faster to support it," he says.

Recording Arts owner Carl Tatz says that, while no one knows what's going to ultimately happen in Nashville, or even whether the downward trend has bottomed out yet, the future will revolve around rates. "There's a void out there right now in terms of figuring out what's going on," he says. "On the one hand, the consolidation trend is actually heartening because I see it as a way of controlling rates. On the other hand, the record label people I talk to tell me that they're looking at two years before things turn around. They see what's going on with the studios, and they're looking to get more bargains in terms of rates. I have one major producer coming in who never haggled on rates before, and this time he's asking for a rate reduction. Not a whole lot, but the fact that he's asking tells me something."

Tatz also expects more work to

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move into producer-owned studios, a complaint voiced by other studio owners and managers. But he also believes that many more traditional Nashville producers prefer to use conventional studios rather than spend the time needed to become familiar with operating their own digital equipment. "I'm curious about how all this will come out," he adds, "but in a way, I want to know but I don't want to know."

In fact, this is a script with no ending but with plenty of dangerous liaisons and the occasional pratfall for comedy relief. Meanwhile, Aunt Gertrude is lying in a ditch on the other side of town. And what of John's love for Mary? Stay tuned... ■

Send Nashville news to Dan Daley at [danwriter@aol.com](mailto:danwriter@aol.com) or fax 615/646-0102.

—FROM PAGE 211, SESSIONS & STUDIO NEWS  
lanta) had Edwin McCain in tracking for his second Atlantic release in Studio A with producer Matt Serletic, engineer/producer Noel Golden and assistant Shawn Grove...New Psalm Records recording artists Grand Design tracked vocals for their debut at Digitrax Multimedia in Hazard, KY, with producers Bernie Faulkner and Wayne Davis...Former Tribe Called Quest member Phife worked on a new solo release at Patchwerk Recording in Atlanta with engineer Mike Wilson...At Crescent Moon Studios (Miami) Sony Work Group artist Jennifer Lopez (yes, the actress who played Selena) tracked for her debut with producers Emilio Estefan Jr., Manny Benito, Lawrence Dermer and Randy Barlow. Cesar Sogbe and Freddy Pinero Jr. engineered, assisted by Alfred Figueroa, Gustavo Bonnet and Tony Mardini...Visom Studios (Lauderhill, FL) recently mastered projects for Mariah Carey and for Cheyenne...Blackacidisco recorded with producer/engineer Rob Tavaglione at his Catalyst Recording (Charlotte, NC)...Dave Nelson and his band worked on a live album and a new studio album at American Holly Studios (Charleston, SC)...Ruthless Records artists Forbidden tracked self-produced sessions on the SSL 9080J in Studio A at House of Blues Studios (Memphis, TN). Jimmy Thomas co-produced, Jean Marie Horvat engineered and Kevin Page assisted...Knight Recording (New Orleans) hosted sessions for Antonio Miranda and the band Venus Envy...La Louisiane Studios (Lafayette, LA) wrapped up work on Rod Bernard's new CD, out on CSP Records. ■



## audix cx-series

### TRUE CONDENSERS

Other microphones claim to be "large diaphragm condensers" when they are no more than 1/2" or 3/4" electrets. Their performance simply does not compare to the sound produced by the Audix CX Series which employs a full 1" gold vapor diaphragm requiring a minimum of 48 volts phantom power.

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e-mail: music@loborecording.com  
<http://www.loborecording.com>

Located 35 minutes east of NYC, Lobo Recording is the place to achieve your creative goals. Recent acquisitions include an SSL 9096J, Neve VR 72, Studer D827 and Yamaha C7 Grand Piano. Other equipment includes Amek Angela IIs, Studer A827s, A80s, ADAT XT's 64 tracks, and an extensive list of microphones and outboard gear. Please call for more info.



## Artisan Recorders Mobile

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For over 20 years, Artisan Recorders has been providing excellence in remote recording and broadcast. Along with an extensive array of equipment in a comfortable aesthetic environment, our "Mobile Red" studio boasts an expert staff of technicians with a love of music and desire for perfection. Recent credits include: "The Big Bang" concert series for radio and television, ABC's Tom Joyner Morning Show, Wyclef Jean presents the Carnival, Dave Matthews Band and many more. When you rock, we roll.



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e-mail: visom@mindspring.com  
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Located in sunny South Florida, Visom Mastering combines state-of-the-art equipment (featuring Sonic Solutions & Weiss Engineering) with well over a decade of experience and customer satisfaction. We offer a comfortable, professional atmosphere to work in, a friendly and knowledgeable staff, and extremely attractive rates. For more information give us a call and see why clients like Sony, Universal/PolyGram and WEA put their trust in us.

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## Studio 880

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The ultimate artist's refuge in a discrete location in the S.F. Bay Area. Studio 880 boasts the best new and vintage outboard gear and microphones in a world-class environment. At the heart of Studio A is an 80-input Otari Concept 1 with moving fader automation and built-in dynamics. Pro Tools 24, 5.1 surround, Foley stage and a huge live room are just some of the other features that make Studio 880 a state-of-the-art production facility. Please visit us at [www.studio880.com](http://www.studio880.com).



## Dungeon Recording Studios

1954 NE 147th Terrace  
North Miami, FL 33181  
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<http://www.dungeonrecording.com>

Located 15 minutes from the heart of South Beach, this three-room facility features 24-track 2-inch/32-track digital recording, Pro Tools 24 editing and automated mixdown. The Dungeon's two tracking rooms have a wide selection of microphones and amplifiers, a baby grand & Hammond with Leslie. Whether it's record or post production, the Dungeon is equipped to handle your project.



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Located in downtown Washington, D.C., Studio 4A offers a spectacular recording environment well-suited to all music genres. Studio 4A, at 2,600 sq. feet, is one of the largest recording facilities on the East Coast. We offer digital and analog multi-track recording, an extensive mic collection, digital editing suites and CD mastering. NPR also offers satellite uplinking, fiber and ISDN capabilities worldwide.



**Mobile Audio Recording Services Inc.**

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## DIGITAL MIXERS

# MACKIE

## Digital 8 Bus Mixing Console



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

### FEATURES-

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



\* monitor, mouse & keyboard sold separately

# Panasonic

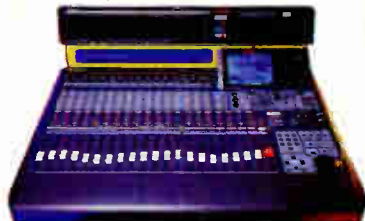
## WR-DA7 Digital Mixing Console



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

### FEATURES-

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



\* meter bridge optional

# TASCAM

## TMD1000 Digital Mixing Console

You want to see what all the digital mixing buzz is about? The NEW TMD1000 from Tascam will have you smiling & automatin' in no time. It features fully automated EQ, levels, muting, panning and more in an attractive digital board with an analog 'feel'. Your digital future never looked, or sounded, so clear.

### FEATURES-

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



## DIGITAL RECORDING

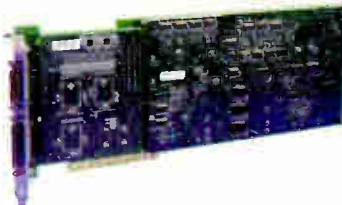
# Lexicon

## Lexicon Studio Recording System

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

### FEATURES-

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



### OPTIONS-

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

## EFFECTS PROCESSING

# t.c. electronic

ULTIMATE SOUND MACHINES

## Finalizer Express



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

### FEATURES-

- 24-bit resolution A/O & O/A converters
- 16 & 20 bit dithering
- TC's unique Multiband Comp & Limiter Algorithms
- Boost and cut over three bands with the Spectral Balance Controls
- Soft Clipping and Look Ahead Delay
- Finalize Matrix for 25 variations in style and rate

- Optimize overall level with the Automatic Make-Up Gain
- Extra compression in each band using Emphasis keys
- Record fades from the built-in Digital Fader or the optional TC Master Fader via MIDI
- Connections include AES/EBU, S/PDIF, Optical Toslink & MIDI I/O's.
- High Res LED Metering of I/O & multi-band gain reduction

## M3000 Professional Reverb



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

### FEATURES-

- VSS-3, VSS-3 Gate, C.O.R.E. & REV-3 reverbs as well as Delay, Pitch, EQ, Chorus, Flanger, Tremolo, Phaser, Expander/Gate, Compressor and De-Esser
- 300 high-grade factory presets including Halls, Rooms, Plates, Ambience, Gated Reverbs, and more

- Up to 300 user presets in internal RAM and 300 more using an optional PCMCIA card.
- Dual engine configuration featuring 24-bit A/D/D/A's.
- Connections include AES/EBU, Coaxial S/PDIF, Optical Tos-Link/ADAT & analog XLR I/O's, MIDI IN/OUT/THRU, Clock Sync and External Control

# Lexicon

## MPX1 Multi-Effects Processor



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

### FEATURES-

- Intuitive user interface for easy editing, built-in help.
- Balanced Analog I/O (1/4" & XLR)
- 56 effect algorithms
- Digital Inputs & Outputs (S/PDIF @ 44.1KHz)

- 18 Bit A/D; 20 Bit O/A Conversion. 32-bit processing
- >90dB of Dynamic Range
- Intelligent Sorting by Name, Number, Application, etc.
- Parameter Morphing
- Dynamic MIDI@ patching & MIDI automation

## COMPRESSORS

# PreSonus

## ACP88 8 Channel Compressor

Starting from their popular ACP8, the ACP88 comprises eight channels of compression, limiting and noise gating for a variety of studio applications. It features individual side chain for each channel and it's attractive blue anodized finish lets you show your true sonic colors.

### FEATURES-

- 8 separate compressors/gates with individual controls.
- Servo balanced or unbalanced inputs & floating balanced or unbalanced outputs.
- Individual side chain jacks for spectral compression and a separate sidechain jack for gate processing.

- Each channel boasts full gain reduction metering, compression threshold indication & gate open/close
- Front panel buttons include hard/soft knee compression, peak/auto compression, bypass, gate range and link.
- Link feature uses a unique summing bus for multiple combinations of master/slave link setups.

# dbx

## Model 566 "Silver Series" Compressor

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

### FEATURES-

- Hand selected Premium 12AU7 vacuum tubes
- +4/-10 operation
- Drive control for a wide variety of great tube effects

- PeakPlus limiter on each channel
- Complete sidechain, OverEasy, and Auto: function
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## HARD DISK RECORDERS

# Roland



### VS1680 Digital Production Studio

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

#### FEATURES--

- 16 tracks of hard disk recording, 256 virtual tracks.
- 24-bit MT Pro Recording Mode for massive headroom and dynamic range.
- Large 320 x 240 dot graphic LCD provides simultaneous level meters, playlist, EQ curves, EFX settings, waveforms and more
- 20-bit A/D D/A converters
- 2 optional 24-bit stereo effects processors (VS8F-2) provide up to 8 channels of independent effects processing.



- New EZ routing function allows users to create and save various recording, mixing, track bouncing, and other comprehensive mixer templates for instant recall.
- 10 audio inputs: 2 balanced XLR-type inputs w/ phantom power, 6 balanced 1/4" inputs, and 1 stereo digital input (optical/coaxial)
- 12 audio outs: 8x RCA, 2x stereo digital & phones.
- Direct audio CD recording and data backup using optional VS-CDR-16 CD recorder

## CD RECORDERS

# Fostex

### CR200 Professional CD Recorder

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

#### FEATURES-

- Converts any input signal to CD 44.1kHz standard
- Uses both Professional and Consumer CD formats
- S/PDIF Inputs and Outputs for versatile interfacing.
- AES/EBU In, XLR Balanced Ins, Unbalanced Ins & Outs
- 5 Record Modes, Records To Red-Book Standards



- IDs Recorded Automatically
- Durable Platter Mechanism Resists vibrations
- Full-function Remote Included

## STUDIO DAT-RECORDERS

# TASCAM

### DA-45HR Master DAT Recorder

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

#### FEATURES--

- Word Clock
- 24-bit A/D and 20-bit D/A with dither
- XLR balanced and RCA unbalanced analog I/O
- AES/EBU and S/PDIF digital I/O



- Word Sync In/Thru
- Alphanumeric data entry for naming programs
- Independent input level adjustment capability
- Output trim for XLR balanced analog output
- Optional RC-D45 Remote Controller

## DIGITAL MULTI-TRACK RECORDERS

# TASCAM

### DA-88 Modular Digital Multitrack

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

#### FEATURES--

- 1:48 minutes record time on a single 120 min tape
- Expandable up to 128 Tracks using 16 machines
- User-definable track delay & crossfade
- Shuttle & Jog capability
- Auto punch with rehearsal



- SMPTE, MIDI and Sony 9-Pin sync capability
- Options include RC-808/848 Remote Controllers, F-88AE/IF-685D digital interfaces, MU-Series meter bridge, MMC-88 MIDI machine control interface, SY-88 Sync Card

### DA-38 Digital Multitrack for Musicians

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



# ALESIS

### ADAT M20 20-bit Digital Audio Recorder

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

#### FEATURES--

- SVHS Recording format - up to 67 minutes recording.
- 18-XLR connections (9 in and 9 out) as well as a 56-pin ELCO connector.



- 24-bit, 64x oversampling recording, 20-bit, 128x oversampling playback
- Digital I/O
- Includes LRC remote and a digital cable.

### ADAT XT20 Digital Audio Recorder

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

#### FEATURES--

- 10-point autolocate system
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.



- Remote control
- Servo-balanced 56-pin ELCO connector
- Built-in electronic patchbay
- Copy/paste digital edits between machines.

### ADAT LX20 Digital Audio Recorder

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

# Fostex

### D-15 Pro Studio DAT Recorder

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

#### FEATURES--

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



### D-15TC & D-15TCR

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

# SONY

### PCM-R500

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

#### FEATURES--

- Set-up menu for preference selection. Use this menu for setting ID6, level sync threshold, date & more. Also selects error indicator.
- Includes 8-pin parallel & wireless remote controls



- SBM recording for improved S/N (Sounds like 20bit)
- Independent L/R recording levels
- Equipped with auto head cleaning for improved sound quality.



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**New Address:**  
**420 Ninth Ave. (Bet. 33rd & 34th St.)**  
**New York, N.Y. 10001**

## TUBE MICROPHONES



### SOLIDTUBE TUBE MICROPHONE



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

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



### audio-technica AT4060



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

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

## MICROPHONES

### SHURE KSM-32



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

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

### BPM CR10



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

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

## SAMPLING

# AKAI



### S5000 & S6000 Studio Samplers



Akai is proud to announce its next generation of samplers with the introduction of the S6000 and the S5000. Building upon Akai's legendary strengths, both machines feature up-to 128-voice polyphony and

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

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

## E-MU Systems, Inc.

### E6400 Professional Sampler



The e-6400 from EMU features: an easy interface that makes sampling easy. Automated features like looping, normalizing and more allow you to flexibly create your own sound palettes or access any of the 40H sounds provided on 2 CDs for unlimited sound creation. It is upgradeable to 128MB of RAM (4MB standard) and features 64 voice polyphony, 8 balanced analog outputs, SCSI, stereo phase-locked time compression, digital re-sampling and more. A dream machine.

## MIC PREAMPS

# Focusrite Green 3 "Voicebox MKII"



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

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

## dbx 586 Vacuum Tube Mic Pre

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



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

## JOE MEEK VC1 Studio Channel

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



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

## MONITORS



### M6000/S Studio Monitors



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

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

## Hafler TRM-8

### Powered Studio Monitors

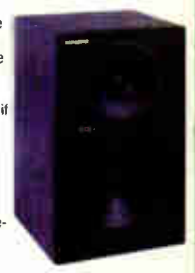


Winner of Pro Audio Review's PAR Excellence Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Trans-nova power amp circuitry.

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

## MACKIE

### HR824



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

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

## TANNOY Reveal



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

- FEATURES-**
- 1" soft dome high frequency unit
  - Long throw 6.5" bass driver
  - Magnetic shielding for close use to video monitors
  - Hard-wired, low-loss crossover
  - Wide, flat frequency response
  - Gold plated 5-way binding post connectors

# Ad Index & Advertiser

PAGE	PRODUCT INFO NUMBER	ADVERTISER
215	143	Aardvark
120	077	Acoustic Sciences Corporation (ASC)
114	072	Acoustic Systems
86	049	Acoustical Solutions
204	135	Acoustics First
80	044	ADK
71	038	Akaï
53	026	AKG (C4000B)
135	090	AKG (C414B)
IFC	001	Alesis (M20)
111	069	Alesis (Q20)
126	084	AlterMedia
98	059	American Gear
11	005	AMS Neve
49	023	Aphex Systems
30-31	016	Apogee Electronics
189	123	Apogee Sound
227	150	Argosy
163	110	Ashly
104	063	Atlantis/Augan
59	030	Audio-Technica
217	146	Audix
220-3	147	B & H Photo-Video
113	071	BASF
28	014	Bellari
115	074	beyerdynamic
190	124	BGW
79	043	Bryston
173	009	BSS Audio
26	012	Burlington/Maxell
148	097	Burlington/Sony
107	066	CAD Professional Audio
119	076	Cakewalk Music Software
213	140	Cal Switch
216	145	Caruso Music
91	054	Carvin
70	037	CD Cyclone
73	040	CEDAR Audio USA
209	138	Conservatory of Recording Arts & Sciences
153	103	Crate Pro Audio
169	115	Crest
123	080	Crown
129	078	Crystal
114	073	The DAT Store
131	089	DataViz
64-65	035	dbx Professional Products
55	027	Digidesign
202	132	Disc Makers
47	021	Dolby
62	033	Drawer/Transamerica Audio Group
136	092	Dreamhore
50-51	024	Duracell USA
52	025	Dynaudio Acoustics
122	079	EAR Professional Audio/Video
162	109	Earthworks
147	095	Eastern Acoustic Works (EAW)

PAGE	PRODUCT INFO NUMBER	ADVERTISER
175	130	Electro-Voice (EV)
36-37	019	Empirical Labs/Wave Distribution
86	050	Empirical Labs/Wave Distribution
14-15	007	Euphonix
168	114	Europadisk
151	100	Event Electronics
249	156	ExpoLatina
150	099	Ex'pression
125	082	Five Towns College
56	031	Focusrite
81	•	Fostex
149	106	Full Compass
165	112	Full Sail
48	022	Furman Sound
136	091	Future Sonics
203	133	Gepco
192	126	Gold Line
152	101	Grandma's Music & Sound
215	142	Guitar Center's Rhythm City
109	067	Hafler
171	116	Hannay Reels
75	042	HHB Communications (Radius)
167	113	HHB Communications (CDR850)
213	141	The Hollywood Edge
25	011	ILIO Entertainments
82	045	Institute of Audio Research
BC	161	JBL Professional
60	029	Joemeek/PMI
156	105	The John Hardy Company
121	087	JVC Professional
155	104	Klark Teknik
72	039	Lafont/Sascom Marketing
124	081	Lawson Microphones
27	013	Lexicon (MPX 1)
127	085	Lexicon (PCM 81)
199	•	Los Angeles Recording Workshop
203	134	Lucasey
18-19	008	Mackie (D8B)
IBC	160	Mackie (Compact Pro)
21	117	Manley Laboratories
226	148	Markertek Video Supply
193	129	Martinsound (MSS-10)
229	153	Martinsound (Neotek Elite)
128	086	MediaFORM
126	083	Mediastore
17	•	Meyer Sound
90	053	Microboards Technology
145	096	MIDIMAN
45	020	Miller & Kreisel Professional
106	065	Mitsui Advanced Media
207	137	Mix Books
230	061	Mix en Español
248	155	Mix Online
112	070	Musician's Friend
13	006	Neumann/USA
193	128	Ontario Institute of Audio

PAGE	PRODUCT INFO NUMBER	ADVERTISER
89	052	Otari (RADAR II)
157	098	Otari (Advanta)
6-7	•	Panasonic
179	119	P. Audio Systems
181	120	Peavey (MediaMatrix)
187	121	Peavey (TSS Four)
226	149	QCA
95	057	QSC Audio Products
9	004	Quantegy
110	068	Quested America
84	047	RADIAL
83	046	Rane
201	118	RCF North America
99	154	Recording Technology 99
216	144	The Recording Workshop
63	034	Sabine
85	048	SAE Institute of Technology
94	•	Sam Ash Professional
192	127	Sensaphonics
205	136	Simon Systems Engineering
188	122	SKB Corporation
1	•	Solid State Logic (SL 9000)
42-43	•	Solid State Logic (Axiom MT)
69	036	Sonic Foundry (Sound Forge)
161	108	Sonic Foundry (ACID)
117	075	Soundcraft
92	055	Soundelux Microphones
57	028	Soundtracs
164	111	Speck Electronics
209	139	Spir Music
22-23	010	Spirit by Soundcraft
32	017	Studer Professional Audio Equipment
152	102	Studio Consultants
96	058	StudioPro99
2	002	Summit Audio
29	015	Sweetwater Sound #1
250-1	157	Sweetwater Sound #2
252-3	158	Sweetwater Sound #3
254-5	159	Sweetwater Sound #4
74	041	TAD/Technical Audio Devices
3	003	Tannoy
61	032	Tascam #1
159	107	Tascam #2
38	018	Tascam/WaveFrame
98	060	Taytrix
202	131	Thoroughbred Music
227	151	Tunedge
105	064	Turbosound/Audio Independence
103	062	Utrecht School of the Arts
191	125	Vega
38	018	WaveFrame/Tascam
93	056	Waves
141	094	Whirlwind
229	152	Whisper Room
87	051	Yamaha (D24)
137	093	Yamaha (MSP5)
130	088	Yorkville



—FROM PAGE 20, ABUSING

The questions of lighting the booth—how to shield, how to dim and so on—were dealt with properly: no lights. But that's what proprioception is for, isn't it? Playing in the dark? Actually, enough light gets in through the window.

As over-the-top as this is, I can now record any guitar, including old soap bar and other non-humbucking pickups, with *no* hum or buzz at all. And PAFs sound incredible.

### WHY DO SOMETHING SO EXTREME?

How many times have you printed the guitar that sounded pretty good—and was pretty quiet—instead of that hacked-up old Strat that sounded *perfect* but was too out of control to deal with? Or you did print that Strat but didn't let the player set the volume and tone knobs where he really wanted to (and where it would have been the sweetest) because there was just too much hum and noise? I won't even *talk* about where you made him leave the pickup selector switch.

For "clean" work, the absence of hum while playing in this metal room opens up the overall feel more than you would imagine. No more sterile and cottony noise gates or expanders. Yup. That old gold-top Les Paul will open its heart and sing with new detail in a room like this.

And for full-tilt, ear-bleeding rock, well, you won't believe the difference! You know the hell that breaks loose when you turn your old Twin up enough to get that wonderful-horrible-saturated-overdriven distortion you dream about at night. You probably take it for granted by now, knowing that you are going to have to take artificial measures to deal with the buzz. Maybe you've never even heard what that Wall-O-Sound is like without the ever-present Flood-O-Hum.

Actually, I *know* you are used to it. Almost every CD I get with overdriven guitar tracks has the same symptoms. The way the guitar is recorded and mixed, *and even the way it's played*, reveals the same preoccupation: hide the hum. Without the hum, there is so much more creative freedom. More freedom to EQ, to compress, to place in a mix. More freedom to hold a chord way into the tail, where it would otherwise degenerate into 60Hz motorboat-ing mush.

Second, the less obvious and *much* less expensive: Though active guitars don't really interact much with the audio cord or the amp front end, all the older (and many newer) passives certainly do. And vintage tube amps definitely interact with the guitar's pickups.

But it starts even before this. Each pickup's impedance, resistance, capacitance and resonance all happily interact with the other pickup's, and the two or three pickups are often wired in crazed combinations of series and parallel by the selector switches. And then there is the "phase" switch. Add to this the guitar's "tone" control circuitry (almost always an insane mix of unpredictable

**I can now record  
any guitar,  
including old soap bar  
and other  
non-humbucking  
pickups, with no hum  
or buzz at all.**

interactive and reactive components: capacitors, resistors, chokes, electro-mechanical delay lines, aluminum foil, silver paint, chocolate chip cookies and anything else they had on the bench when they designed the things), and you start to see the complexity of the issue.

Any and all components in a circuit will interact unless isolated with an active gain stage. And here we have ten crazed pickup wiring combinations, multiplied by whatever the phase switch does (50 combos now?), multiplied by the effects of each volume and tone pot—reaching 2,000 discernible combos, if not more. All interacting, all ready to interact with whatever's seen next. And that, friends, is the guitar cord.

So you *have* to use the highest-quality, largest-diameter, lowest-capacitance cord you can find or build. If you can get one with braid *and* foil shielding, get it. If you want to go to the trouble of building a special one, use top-grade *balanced wire*, solder the hot lead to the tips, the cold lead to the sleeves, and the shield to the cold lead—on one end only! Leave the other end of the

shield unconnected and insulate it so it can't accidentally touch the cold or hot leads inside the jack cover later (like in the middle of the best guitar solo you have ever heard).

Make sure to choose a twist pitch that is right for your location (you *do* know that the hot/cold lead twist pitch should be different for 60Hz and 50Hz countries, right?). Make several of these things, in 6, 12 and maybe 20-foot lengths.

Choose the shortest cord you can get away with. All passive guitars interact with all cords, but the shorter the cord, the less the interaction. And the higher the cord quality, the less the interaction. Try the cord *both ways*. Yes, I know that you shouldn't have to do this, but in the real world, your guitar might be quieter with the soldered shield end in the amp, or it might be quieter with that end in the guitar.

Now you have done all you can do. Of course, all this assumes that you are after that hard-earned sweet sound of a totally passive chain like the old days. It assumes you *want* to have as much guitar-to-amp interaction as possible.

Oh, yeah, and keep the following two things in mind. First, most tube amps have slightly different circuitry on each input, so try every input for the best possible combination of sound and lowest artifact level. Second, turning the guitar down 20 dB and the amp up 20 *never* gives you the same results as doing the inverse. The same *level*, yes, but not the same sound. I know you knew, but maybe you just forgot.

On the other hand, you can avoid all this silliness by putting a line amp in the booth three feet from the guitar. Unpredictable interaction will disappear, but along with it goes any hope of capturing that sweet organic warmth and rich character that could be yours if you went the high road.

### IN CONCLUDING PART 1

I am aware that parts of this column may be a bit esoteric to some of you, and other parts may seem obvious to others. Well, take what you want and leave the rest for the next guy. Depending on which group you fit into, you will either be happy or horrified to learn that Part 2 has the truly crazed stuff in it. ■

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## INSIDER AUDIO

—FROM PAGE 28, GEORGE MARTIN

was when he learned to play chess." Ringo again: "I was lucky to be in a band with three frustrated drummers. They could all play drums, but each of them knew only one style."

On "Being for the Benefit of Mr. Kite," John wanted to bring in a real steam-driven calliope, but Martin found out that, besides the nightmare of having such a contraption in the studio, calliopes weren't played by hand but were programmed, like player pianos, using punched cards. "Just for us to make a card punch so that we could tell it what we wanted to play would have taken forever," he said. So instead, they built up the sound using a foot-powered harmonium, Lowrey and Hammond organs, with long-suffering roadie Mal Evans puffing away on a bass harmonica. Martin played the fast organ riffs with the tape running at half-speed—"As you all know," he told the crowd, most of whom did know, "it makes you sound bloody brilliant." And while Martin and engineer Geoff Emerick were pulling off the legendary cut-up-the-tape-throw-it-in-the-air-and-reassemble-it-at-random trick, "John was like a kid in a candy store."

At one point, "A Day in the Life" had 24 bars of empty space in the middle of it. "You can hear a little alarm clock at the end of the 24 bars, which let us know when to come in," he said. "I asked what they wanted to put in there, and they said, 'Let's have a symphony orchestra.' I said, 'Okay, what will they play?' and they said, 'Anything they like.' They didn't understand that symphony musicians can't play anything unless you put music in front of them." Martin sketched out the charts for the players, telling them, "Don't listen to the chap next to you. If you're playing the same note he is, you're playing the wrong one." All their lives, they'd been told to try to play as one man—in a few minutes, The Beatles changed all that."

After the "orchestral orgasm," the first idea was to have "a giant 'hummm,' like a Tibetan chant. I can't tell you how pathetic that sounded." The giant piano chord that they ended up with required three of them to play at the same time, and then to hold their breaths. "At the end of it, the amplification was turned up so high," Martin said, "that if anyone of us had coughed, it would have sounded like a bomb."

"I was a little worried we were tak-

ing people too far with this album," he told us. "But the head of Capitol Records in the U.S. came by, and I played him 'A Day in the Life,' and he was absolutely gobsmacked. 'I never heard anything like it,' he said. I knew if we had him, we'd got it."

And the multitude of faces on the album cover? They were a logistical nightmare—not just setting up the photo collage, but getting permission to use the likenesses of all the people on it. Remember, this was long before the Internet, and people still felt they had a right to their own images. "EMI insisted that we get clearances for all of them, but they wouldn't do it themselves. So Brian hired his old assistant to make the phone calls and letters. Leo Gorcey, an actor who had been in the Dead End Kids, wanted \$500, so we painted him over. Mae West wrote back, 'What would I be doing in a Lonely Hearts Club?' So we got the four of them to write her a letter expressing their admiration for her, especially for her having spent ten days in jail for obscenity, and she relented. Think about how much that letter would be worth today—certainly a lot more than the \$500 Gorcey wanted!"

By the time you read this, Sir George Martin's tour will be over, but some 10,000 people will have been privileged enough to experience it. We all owe more to this man than we can possibly express, and this tour was a reminder of that. But it was also his way of giving something back to the audience (or a very small segment thereof) who allowed him to pursue such a brilliant career. And my way of thanking him is to let him have the last word:

"Music, I was told, was a nice thing to be able to do, but it wasn't something sensible people tried to make a living at. To me, it didn't seem any more hazardous than flying for the navy [which he did in World War II]. I always followed my gut feeling, whether it was whether I should go into music, or should I sign this band or do this film. And it's always worked. If you're a gambler, and you always bet the favorite, you end up losing money. If all you care about is statistics, you might as well be in the insurance business." ■

*Paul D. Lehrman, whose wife shook hands with John Lennon in 1964, is editorial director of Mix Online (www.mixonline.com). An earlier version of this piece appeared on that Web site.*



## THE MIX INTERVIEW

—FROM PAGE 98, BLONDIE

Stein: Yeah. That was a song I did a demo for on one of those little Roland pocket sequencers. Clem had been talking about doing a 3/4 song, and I had it already sketched out. At this point we're thinking of doing a more straight-ahead country-rock version because no one ever crosses over into country from rock; it's always the other direction.

Harry: Chris had wanted to do a waltz piece. That's one that's pretty much the way he brought it to us.

*"Out in the Streets" is a nice slice of girl-group pop, with those cool backing vocals.*

Harry: That's a song Ellie Greenwich [and Jeff Barry] wrote for the Shangri-La's. Ellie has worked with us through the years. We thought it was sort of apropos today because of all the gang stuff going on. But it's such a beautiful piece of music. It's actually a song that Blondie has been doing since 1974. I've been doing that song for a long, long time.

Leon: "Out in the Streets" was the first demo I ever heard from Blondie, when I was working at Sire way before I got involved with them.

For the backup vocals on the album, we'd usually fit those in after the lead vocal was done. Sometimes we'd leave gaps for them. There were also some parts that were done on keyboards originally that were taken off and replaced with vocal lines. There was a lot of chopping and changing all the way to the end, including replacing some of the basics.

*What's the story with "Boom Boom in the Zoom Zoom Room"? Debbie, was that influenced by your work with the Jazz Passengers?*

Harry: Clem came in with this idea that we should do a little swing thing; he was thinking about the Jazz Passengers. The lyric was from a story that Ronnie Catrone told me; it's just a crazy thing.

Leon: We were going for a sort of murky, kind of lounge-y sound that was almost like a cross between something on an old Doors record and jazz, and even elements of the first Suicide album I did—that's partially what Clem was looking for with the strange hi-hat thing going in the background. So that's what the track was, and then Debbie came up with an incredible jazz melody on top of it.

*Does being on the road with Blondie feel nostalgic, or does it feel like a new thing?*

Harry: It's a little of both. We know each other so well and yet this is definitely a new era for us, a fresh start. A lot of our old friends and fans are showing up, which is great, and also teenagers—kids who never saw us years ago.

Stein: It's really mixed. It's great—I'm meeting a lot of young girls! [Laughs]

*Can you play obscure Blondie tunes or do you feel an obligation to pretty much play the hits?*

Stein: We pretty much stick to the crowd-pleasers. A few years ago, I wouldn't have wanted to do that, but now I'm seeing everything through fresh eyes and so it doesn't bother me. There are so many young kids out there who have never seen us perform before, so it's nice to be able to play the songs they might know. I'm even feeling kind of sentimental about some of the old stuff myself. We're playing four songs from the new album right now; we'll probably work up seven or eight before it's over.

Harry: I enjoy playing our hits. They're all pretty good songs. They've enriched my life, and there's a certain personal satisfaction you get from that kind of acceptance. People love these songs. We're entertainers. I'm happy to sing them. "Rapture" is a lot of fun to do. "Dreaming." I like them all. Obviously, there is a lot of other material we could do, and on my solo tours I did some Blondie songs that were a little more obscure, like "Cautious Lip" and "Rifle Range," and I enjoyed doing those.

*Do you see No Exit as the first in a series of new Blondie albums?*

Harry: One would hope so, but honestly I guess it depends on business. If the record sells, it will warrant us doing another. I'd like to do another one, try some different things. Maybe we'll do something that's a little more unusual next time; I really can't say what it will be. Maybe we'll do something like *Metal Machine Music* [Lou Reed's infamously unlistenable noise record]. Who knows?

Leon: I really hope they do another record. From what we've been talking about, it'll probably be something that's radically surprising. This record [*No Exit*] is to establish that, yes, Blondie is still in existence and they can still sing and play great. But the next one...well, we've discussed all kinds of things. It could be pretty out there. I hope so! [Laughs]

*Blair Jackson is the executive editor of Mix.*

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## INTERNATIONAL UPDATE

—FROM PAGE 114, THE BRITISH INVASION

cessful in the world, and at least two—Martin Audio and Turbosound—owe a large part of their international following to their early success in the U.S. Formed in 1971 by Australian David Martin, Martin Audio initially manufactured just one product: the compact folded bass horn known worldwide as “the Martin bin.” Sold exclusively through the London-based sound system design company Kelsey Morris, the Martin bin became the foundation of most British P.A. systems of the time, including the much-admired Pink Floyd system, which was large enough to be rented out for festivals when the band was not using it. (For several years Roger Waters’ onstage bass rig consisted of Martin bins and JBL radial horns.)

Because Midas shared space with Martin Audio in a mews near Euston Station in London, the two companies were often associated in the minds of customers; many live sound engineers still swear by the “Midas-Martin” systems that resulted. Supertramp’s sound rental company, Delicate Productions, was one of several U.S. companies that committed to the Midas/Martin setup, and Martin’s midrange horn, dubbed the “Philishave” because of its resemblance to an electric razor, became a familiar sight at concerts in the late ‘70s. Other famous Martin products included the LE400 monitor, which was introduced in 1972 and eventually sold around 10,000 units worldwide, and the modular F2 System introduced in 1988. More recently, Martin has introduced the W8CM and W8CT high output concert systems, and the company has also developed a range of products for the installation and cinema markets.

Another British speaker company that has parlayed its success in the U.S. to a healthy presence around the world, especially in Asia, is Turbosound. “If we’d just stayed in Europe, it would have been much harder to make the international sales breakthrough,” says Turbosound founder Alan Wick. Already established in the UK live sound business as a sound mixer and rental company owner, Wick first came across the Turbosound name in 1979. Impressed by the sound of the innovative system, Wick sold his own P.A. system to his major client, The Jam, and joined up with Turbosound designers Tim Isaac, Tony Andrews and John Newsham, who were then working out of an Army hut near Dorking, Surrey.

Realizing early on that the U.S. market was essential to long-term success, Wick opened a sales office in New York and began promoting the company’s newest product, the TMS-3, which was first widely heard in the U.S. on a Styx tour. In 1983, Wick hired a recent college graduate named Daniel Abelson to handle U.S. marketing, and by the mid-’80s Turbosound was firmly established. The TMS-3 went on to sell 4,000 units worldwide and was soon followed by the even more successful TMS-4 (6,000 units sold worldwide). Turbosound also introduced the world’s first 24-inch subwoofer cabinet (the TSW-124) and continued to upgrade the product line with the Flashlight system, which arrived in 1991, followed by the Floodlight and Highlight ranges.

Jack Kelly remembers the period fondly. “In those days, you could run into everyone in the business at the Los Angeles Hilton bar during the AES convention,” he recalls. “If someone was putting together a system, I’d tell him to go to Wayne Freeman for a board—it happened to be a Soundcraft, but you were primarily buying a board from Wayne—and to call Danny Abelson at Turbosound before buying a P.A. We must have sold dozens of systems made up of the same basic components—a Soundcraft board, Turbosound P.A., BSS and K-T processing, and QSC amps.” But, as Kelly notes, the growth of the live sound market spelled the end of the freewheeling business climate. “The business changed in the ‘80s as tour accountants took over,” says Kelly. “They fixed a ceiling on the P.A. rental rates, which haven’t really gone up in the last 15 years, and started emphasizing economy over quality.”

## MEET THE SUITS

A more formal business climate also brought about other changes. By the mid-’80s the live sound market had become large enough to attract the serious interest of Japanese manufacturers. In a pre-emptive defensive move, BSS marketing director Nigel Olliff suggested to Turbosound’s Wick that the two companies would be better positioned as a partnership. BSS and Turbosound duly merged in 1986 under the umbrella of a company called Edge Technology Group Ltd. A year later, EdgeTech founded Precision Devices Ltd., a loudspeaker company, and in 1989 EdgeTech was sold to AKG, which was then bought by Harman International in 1994. Harman, originally a consumer hi-fi and car audio company, already



owned JBL when it purchased Soundcraft in the early '80s and, having acquired AKG (along with BSS, Turbosound and Precision Devices), Amek and Studer, is now the largest pro audio company in the world.

Because the Harman portfolio already included JBL, Turbosound found itself in competition with its corporate sibling, and for some years the latter's product development was aimed away from concert sound and toward the club and installation markets. In 1998, after spending several years in the hospitality industry, Alan Wick led a successful management buyout of Turbosound. Back in the saddle as managing director of the company he had started, and backed by European venture capitalists Investors in Industry (3i), Wick is planning a slew of new product introductions and fully intends to recapture his company's former position as a market leader in concert sound. It is the kind of challenge he has faced before. "In the early days of Turbosound, ElectroSound took out a license on the technology and had a set of festival systems made up in enormous flightcases," recalls Wick. "They were called Turbo boxes and they sounded awful, so when we opened up as Turbosound in the U.S., we had a serious image problem to overcome."

Harman was not the only company that went shopping for UK-based pro audio manufacturers. In 1990 the Mark IV holding company, which already owned Electro-Voice and Altec, bought Klark Teknik. By this time, K-T, which had gone public in 1984, had also bought Midas and DDA, so Mark IV got all three companies at one swoop. In 1996 Mark IV was bought out by Greenwich Street Partners and has now been merged with Telex to become Telex/EVI (it may have been during this transition that K-T's hyphen was finally laid to rest—the hyphen had been appearing and disappearing in company sales materials for years). However, the British partners were not entirely happy in Buchanan, Mich., and, though very much part of the Telex/EVI organization, the Klark Teknik Group is now headquartered back in Britain.

Similarly, Martin Audio was acquired in 1990 by TGI, a holding company that also owns the Tannoy and Goodman loudspeaker companies. However, though David Martin stayed on under the new management, he went missing in late 1992 after a confrontation with his partner in a non-audio business venture. Martin's body was never found,

but his former partner was arrested and convicted for his murder.

#### MORE TEA, VICAR?

This brief history of British-based manufacturers in the U.S. live sound market is necessarily selective and even simplistic. The influence of the British sound system rental companies that operated in the U.S. in the '70s—TASCO, TFA/Electrosound and Malcolm Hill, for example—should not be underestimated, nor should the influence of such successful and equipment-intensive live acts as Supertramp and Pink Floyd be ignored. These organizations, and others like them, brought dozens, if not hundreds of British sound engineers to the U.S., resulting in a cross-pollination of ideas and techniques that has enriched the professional and technical vocabulary of both communities. The British may not be able to teach the Americans how to make tea properly, but the "Teabags" have at least shown that they can design and manufacture quality audio gear for live sound.

Most would agree that the U.S. live sound business will never be quite as exciting, freewheeling and potentially profitable as it was during the first two decades after The Beatles stopped touring. But there will always be room for new products that offer otherwise unavailable functionality, are sonically superior, or are just more fun to use. And success in the U.S. market is a fair indication of a product's viability worldwide. As Turbosound's Alan Wick stated in a recent telephone call from England, "The U.S. is the most competitive market in the world, so if you get it right over there you can flourish anywhere."

•••

The author would like to thank the following for their help in preparing this article: Danny Abelson and Alan Wick of Turbosound, Chas Brooke and Nigel Olliff of Quantdrop, Bill Calma of TGI North America, Lyle Dick of A-1 Audio, Wayne Freeman of Amek, Clive Green of Cadac, David Bissett-Powell and Rob Hofkamp of Martin Audio, Jack Kelly of Group One, Ted Leamy of Electrotec, George McKechnie of BSS, Don Pearson of UltraSound, Smoother of Delicate Productions, and David Solari of Cyberlogic. ■

*In 1976-77, Chris Michie could have been found mixing on a Soundcraft Series II. Acts whose sound was thereby improved included Blondie, Tom Petty & The Heartbreakers, The Jacksons, Neil Sedaka and Dolly Parton.*

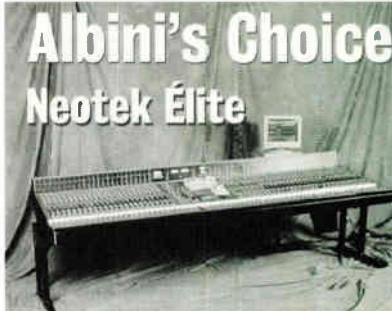


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## FIELD TEST

—FROM PAGE 152, SOUNDTRACS DPC-II

put. A definable, switchable insert point is available for each output, enabling easy pre/post encoding comparison. Finally, the sources are mapped to the outputs in yet another matrix layout. Each output can contain a mix of the eight sources. Additionally, an output can be set up to toggle one or more of the sources on or off when it is selected.

Given that everything in this system carries user-definable labels in menus that never go more than two levels deep, and the whole configuration process is conducted using the touchscreen, setting up the Monitor Matrix is much faster and easier to do than the description above would seem to indicate.

### AUTOMATION

Automation in the DPC-II is available in an offline edit mode as well as in real-time recording. The touch-sensitive faders allow some excellent options such as touch recording (the channel goes into Record as soon as the fader is touched) and auto-nulling on release (when the fader is released, the channel goes out of Record and fades from its current position to the existing automation level).

All channel and bus parameters can be automated, and automation modes can be set for each channel *and each parameter* individually. Standard absolute, relative and update modes are present, as well as both snapshot and dynamic automation. Missing from the DPC-II is one of my favorite automation features, where a fader drops out of record when it crosses through the level from which the move started. Auto-nulling—or manually nulling by releasing the fader in Auto null and re-touching the fader to manually null—can be made to suffice, but is not as good when fast moves, which are difficult to finish precisely, need to be made.

Offline editing is done via a graphical display that shows control movements for multiple tracks or parameters of a track. Mutes are shown by color-coding the section of the fader automation display, which lets you easily see the movements that are being muted out. The offline editor is just about the only major part of the console's user interface that requires heavy use of the trackball. Where buttons are touchable in the rest of the DPC-II, they must be clicked in the automation editor. Changing from the touchscreen to point-and-click operation feels like a rude awakening and a step down in ease of use; the touch-sensitivity will spoil you

quickly. Soundtracs plans to make more of the automation functions touch-operable in future software upgrades. Nonetheless, the toolset for offline editing is thorough and powerful. In addition to standard cut/copy/paste/delete stuff, there are tools for nudging, fading in or out, "joining" (i.e., crossfading) between levels, and so forth.

Only one mix pass is stored in memory, but up to 99 can be stored to disk. (With a few extra steps, another 99 can be stored, too.) It is not possible to switch between mixes during an automation pass, but parts of several mixes can be combined by cutting to the clipboard, loading a different mix and pasting.

### CONCLUSIONS

In all, my review circumstances did not permit me to do an extended critical evaluation of the DPC-II's sound quality, but I was able to get a pretty strong feeling for its operation and how a session would flow. Clearly, a lot of market research was done in designing the interface for this console, and Soundtracs listened to the users. There are many, many small touches and organizational aspects that clarify and simplify working on this board.

For example, the color-coding of the EQ bands and knobs is very helpful in keeping track of four bands of full-bandwidth EQ. The system of organizing inputs and outputs into groups speeds routing considerably.

Consideration of the challenges of assignable consoles shows in the way the channel display supports layering: When one layer is selected, the channel display has a small area that shows the label and a very small level meter for the layer that is not selected, enabling the user to quickly scan levels on the hidden layer without having to flip one or all of the inputs.

The lack of stereo linking is a peculiar oversight. Equally strange is the inability to copy settings (EQ, dynamics) from one channel to another. Of course, EQ and dynamics settings can be stored as presets and then recalled on other channels, but that introduces several extra steps to a common function.

Soundtracs takes a novel approach to its software version numbering. Although the DPC-II has been shipping since last year, and is certainly quite functional, there are still features and buttons that are present in the display but, as yet, unimplemented. Most companies designate the software version at a product's release as V.1.0 and increment from there, but, at the time of this writing, the current software version for

the DPC-II is 0.84. Soundtracs says that Version 1.0 will represent a full implementation of their feature specification, including the stereo linking feature mentioned previously. Version 1.0 is expected to be released this summer.

All in all, I absolutely love the touch features of the DPC-II, and Soundtracs has done the finest job I have seen in creating a mixing console that takes the greatest advantage possible of touch-sensitivity to increase ease-of-use on a programmable control surface. This, combined with the price, feature set, footprint and quantity of inputs and outputs, puts Soundtracs squarely on the map as a player in the large-format console sweepstakes. The DPC-II offers extensive facilities, ease of use and affordability. If you are considering a large-format console, I strongly recommend starting with a close look at the DPC-II. You may need to go no further.

Mix would like to thank Sound Lounge in New York City for graciously offering studio time on its DPC-II for our evaluations.

Soundtracs USA, 200 Sea Lane, Farmingdale, NY 11735; 516 333-9100; fax 516 333-9108. Web site: [www.soundtracs.co.uk](http://www.soundtracs.co.uk). ■

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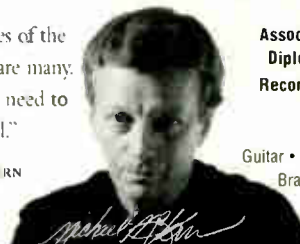
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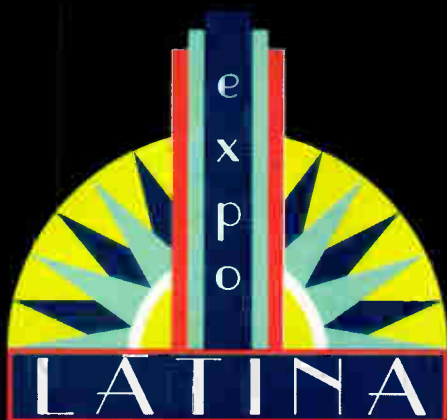
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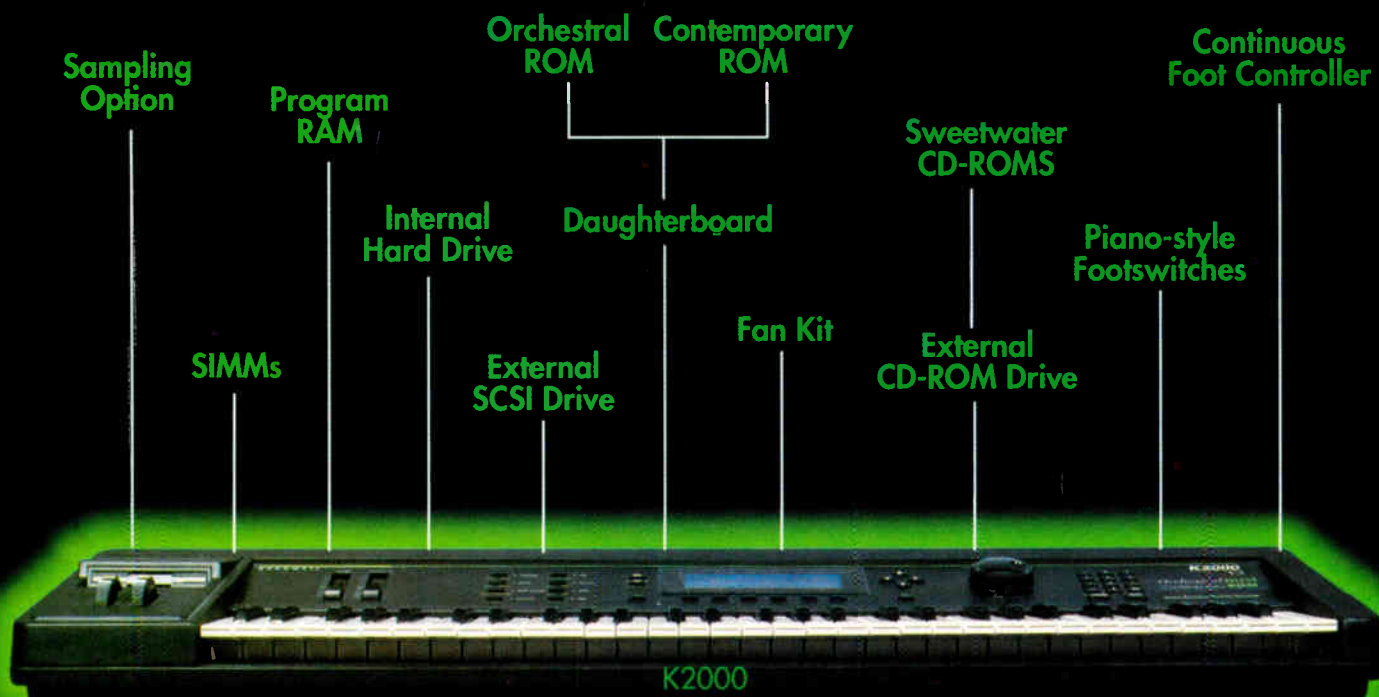
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# OPTIONS



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These charts will give you an idea of the powerful options available to you. With the Kurzweil K2 Series instruments, you get tremendous value as you can select the features you want — without paying for the ones you don't.

Exactly which options are right for *your* custom Kurzweil? That's where we come in. **Sweetwater Sound** has more experience building and supporting customized Kurzweil instruments than anyone else in the world. In fact, the very first music technology product we ever represented was the legendary K250 system from Kurzweil. Since then we've been building complete systems, creating lush, critically-acclaimed soundware libraries on CD-ROM and helping thousands and thousands of musicians get the most out of their Kurzweils.

Ready for an instrument that transcends the ordinary? Ready for an instrument that's built to your specifications for your music? Ready for the sonic thrill ride of your life? Then you're ready for a custom-configured Kurzweil from Sweetwater.

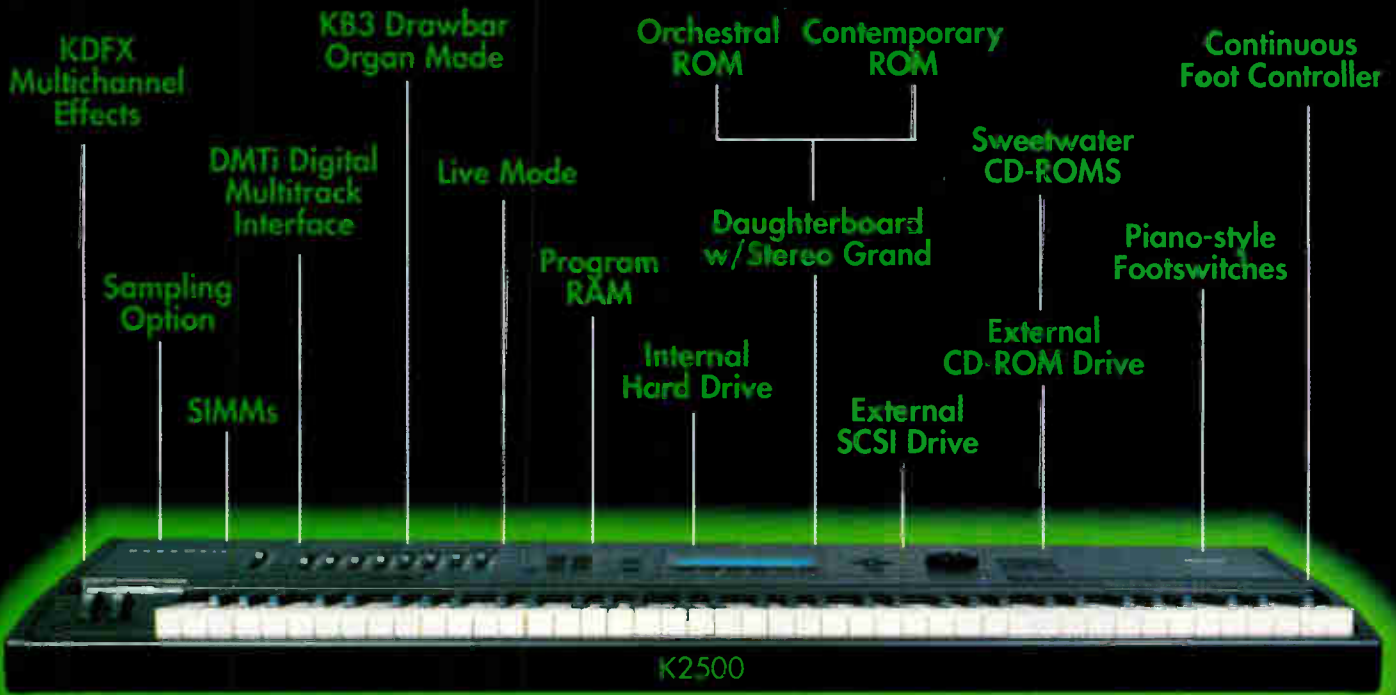
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- **KDFX Digital Multichannel Effects:** Add new pro-quality, 4-Stereo Bus digital effects to your existing internal effects. *(Available for K2500 only)*
- **Sample RAM:** Install up to 128 MB (up to 64MB in the K2000) for your Samples.
- **Live Mode:** External digital or analog signals can now be processed and controlled via Kurzweil's Variable Architecture Synthesis (V.A.S.T.) engine. *(Available for K2500 only)*
- **KB3 Mode:** Realtime Drawbars with all the features of a real B-3 Organ. *(K2500 only)*
- **Contemporary ROM:** 8 MB of Modern sounds and Ethnic Instruments including percussion.
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- **Daughterboard:** Required if you want to add the Contemporary or Orchestral ROMs. The K2500 daughterboard comes with an outstanding set of Stereo Grand Piano ROM Samples.





# = POWER



- **Program RAM:** Holds additional Programs and Songs (not Samples) even after power off.
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- **DMTi:** Digital Multitrack Interface. Connect your K2500 directly to your Alesis or TASCAM multitrack for pristine digital transfer of audio data. (Available only for K2500)
- **External Hard or Removable Drives:** Virtually limitless storage for all your data.
- **Sweetwater CD-ROMs:** Push your Kurzweil to the max with Ultimate Guitars, Total Stereo Session Drums, Grand Pianos and more.
- **External CD-ROM Drive:** We have the fastest Kurzweil-compatible drives available anywhere!
- **Piano-style Footswitches:** Elegant single or dual style.
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What do you get when you combine a Windows computer with Mark of the Unicorn's 2408 hard disk recorder? You get an astounding, creative tool with a universe of powerful options for composing, editing, and recording.

Add hard drives, backup, and CD burning from *Cliff*, and software from *Steinberg*, *Sonic Foundry*, *Bitheadz*, *Waves*, and *Antares* for a comprehensive desktop studio!



# We do Windows ...together

## Steinberg

### Producer Pac / 24

Want the world's hottest PC software for recording, producing, mixing, and mastering your music in stunning 24-bit/96kHz resolution? Steinberg's Producer Pac / 24 brings together all of these top programs at a tremendous discount—over 50% off! And if you purchase Producer Pac / 24 from Sweetwater by September 1, 1999, you get the Magneto analog tape emulator plug-in at no extra charge—an additional value of \$199, available only from Sweetwater Sound!



### WaveLab

Far more than a stereo audio editor, WaveLab's extraordinary accuracy and unmatched plug-in support give you tremendous mastering capabilities. One of our clients traded in their \$70,000 dedicated mastering "solution" in favor of WaveLab. Why? The sound is silky smooth with up to 64-bit internal processing (that's 1024 times the resolution of a 16-bit editor); operation is lightning fast; extensive plug-in support gives it more processing power and it runs on the same PC as your sequencer. WaveLab also features advanced file analysis, an extensive audio database, and the ability to burn Red Book audio CDs that are ready for duplication.

## CUBASE VST / 24



### Cubase VST / 24

VST is the hub of your MIDI/Audio world. Often copied but never duplicated, Cubase defines graphic arranging and realtime MIDI effects. VST / 24 is the latest advancement with full 24-bit capability and powerful VST audio processing—another Steinberg created standard.

## Steinberg



### FreeFilter

Spectral Design's FreeFilter boasts 30 (that's thirty!) bands of graphic EQ in either linear or logarithmic modes. The really cool thing about FreeFilter is that it can actually lift the EQ characteristics from one piece of audio, and apply it to another! Don't try that trick with any hardware EQ!

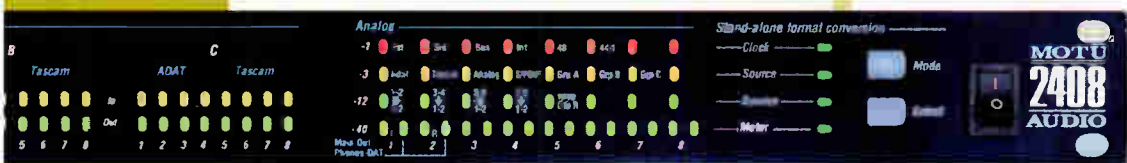


Wave's Renaissance Compressor is one of the most highly regarded audio processors ever. Use it on individual tracks or your entire mix—wherever you want amazing sound.





Turn the page to discover more wonderful Windows opportunities!



**The undisputed price/performance leader for multiple output Windows audio.**

Why is the 2408 such a huge, world-wide hit? Its 24 channels of simultaneous input and output for under \$1,000 is simply unmatched by any other device. You get analog I/O, digital I/O and tons of advanced features.



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We here at Sweetwater Sound can honestly say that we have enjoyed unrivaled performance from Glyph and give them our highest recommendation.



**Put your drives and DigDAT™ backup in the same bay with Glyph's road-tested rackmounts.**

It's essential to understand that not all hard drives are created equal! For the maximum number of playback tracks and plug-ins with error-free operation, you need a serious drive that has been specifically tested for digital audio with today's advanced audio software. While that "budget" drive in the PC catalog may be fine for word processing, your music demands bulletproof performance. You'd never trust the cheapest no-name tapes. A premium-quality hard drive is just as important. Glyph consistently combines top components, heavyweight construction, comprehensive testing, and stellar tech support to create the most trustworthy storage devices you can own. Plus, they are available in road-worthy rackmounts—perfect for your pro audio rig!

**Want Fast, Painless Backup?**

Nowhere is reliable backup more essential than with your original music. If you lose your files, they're gone forever! Don't like the hassles of backing up? That's why Glyph's DigDAT is such a fundamental foundation for your rig. Easily backup large sessions onto a single DAT tape. Confidently archive and retrieve your tracks quickly, without headaches or days of down time. Backup may not be "sexy," but nothing will win you more creative time than avoiding even a single devastating crash. Adding a Glyph DigDAT is perhaps the single best favor you can do for your music!

**Which Glyph Drive is Right for You?**

4 Gig? 9 Gig? 18 Gig? Fast & Wide? Ultra-Wide? The choices can be staggering. That's why your Sweetwater Sales Engineer will work with you to determine the best approach for your personal needs, rather than stick you with a cookie-cutter "solution."

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- Step 1:** Start with a Windows computer.
- Step 2:** Add the MOTU 2408 recording system.
- Step 3:** Combine with software from Steinberg, Sonic Foundry, BitHeadz, Waves, and Antares.
- Step 4:** Complete with a robust Glyph hard drive, DAT backup, and CD-Burner.
- Step 5:** Serve hot and enjoy astonishing power!



# We do Windows ...together

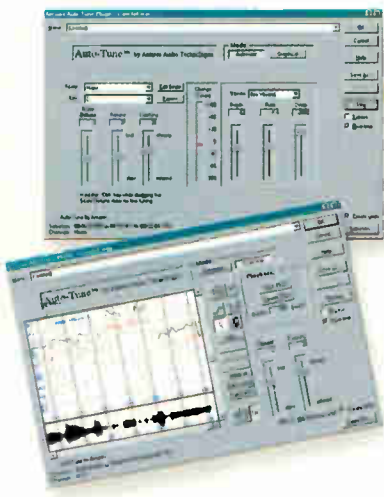


## ANTARES

### Auto-Tune Pitch Corrector—Now for Windows!

When Auto-Tune first hit the market as a TDM plug-in just a short while ago, the response was truly amazing. Delivering intelligent intonation correction without robotic side-effects, Auto-Tune was so good folks were purchasing \$8,000 systems just to run it! Now the full version of Auto-Tune is available as a DirectX plug-in to use with your Windows audio rig. Correct intonation problems in vocals or solo instruments in realtime, without distortion or artifacts, while preserving all of the expressive nuances of the original performance. Auto-Tune gives you both Automatic and Graphic Modes to fine-tune your fine-tuning! And the pros all love Auto-Tune because the only sonic difference between what goes in and what comes out is the intonation.

"Holy Grail of recording"—Recording Magazine



### Sonic Foundry Mastering House

While Mastering House is an incredible collection of professional mastering tools, that's just the beginning. It also brings you brilliant creative capabilities you can use at every stage of the recording process. This new bundle saves you a bundle as well! Let's step inside:

**Sound Forge 4.5**—Your host? The award-winning Sound Forge Audio Editor of course! It slices! It dices! It sets the standard for editing Windows audio. Great with the 2408 or any Windows soundcard. MC Sound Forge also serves up steaming loops and DSP effects.

**CD Architect**—Who's spinning the tunes? Why it's CD Architect! Design and build your own audio CDs with speed and precision. You'll rave about the drag-and-drop playlists. Exact control of crossfades, track markers, EQ, compression, and support for both SCSI and ATAPI/IDE burners help you perfect your master CD.

**XFX 1 & 2**—Take your sound out of bounds with the XFX 1 & 2 collections of amazing audio plug-ins. Noise Gate, Multi-band Dynamics, Compression/Expansion, EQ, Reverb, Time Compression, Pitch Shift and Chorus effects — whew! From tracking to mixing to mastering, you'll use these processors day in and day out.

### More Sonic Foundry Software & Plug-ins

**ACID**—"The coolest, easiest way to remix," proclaims acclaimed remixer Doug Beck. "True innovation," says Craig Anderton in EQ magazine. Feeling the fervor even further is Jeff Mac of Audio Media magazine who writes, "ACID is an absolute godsend." But Jeff, how do you really feel? Electronic Musician magazine took the easy way out and simply awarded it a 1999 Editor's Choice Award. No matter how you try to describe it, ACID burns through your preconceptions about creating music with a battery of realtime tools. Seamlessly mix & match tempos and pitch from drastically different loops without dropping a beat!

**Noise Reduction**—Got 60-cycle nasties, annoying clicks & pops, or horrible hums & rumbles? You could spend the rest of your natural life redrawing waveforms by hand. Or you could simply reach for Noise Reduction. It works wonders restoring "damaged" audio. About the only thing Noise Reduction can't quiet down is our enthusiasm for it!

**Acoustic Mirror**—Tired of the same old Reverb? Acoustic Mirror adds the acoustical coloration of real environments and sound-altering devices to your recordings with uncanny realism and stereo imaging. Simulate everything from large concert halls to vintage tube mics, or generate new effects. It includes an extensive library of high-quality acoustics "signatures" from a wide variety of environments.







**24 I/O, ADAT, DIF, S/PDIF, Word Clock, and more—under \$1,000!**  
Sweetwater Sound has installed more 2408 systems than any other company in the world. Want to get the most out of your 2408? Take advantage of our experience with configuring and operating this amazing recorder for maximum performance, whatever software you choose.



**Unity & Retro—Superb Sampler & Software Synth!**

Bitheadz is storming the software module world with unrivaled software sampling and synthesis. Using the power of your Windows computer, Unity and Retro simply blow away hardware approaches when it comes to both features and price performance. These are some of the most exciting products we've encountered in a long time. And with the multiple high-quality outputs of the MOTU 2408, you get everything you need to make Unity and Retro really sing! Both are ASIO and Direct Sound compatible.

**Unity**—The power and convenience of a full-screen software environment combined with awesome 24-bit, phase-locked stereo sampling! Imports 16 or 24-bit WAV, AIF, Aka, S-100, CD-Audio, SoundForge 2.0, Sound Designer I/II, Sample Cell I/II and more. Cross-switch up to 128 samples per note.

Simultaneously loads from disk while playing. Built-in digital audio editor. Includes over 250MB of sounds with instruments, loops & GM bank.

**Retro**—Transform your computer into perhaps the most powerful analog synthesizer ever devised. You get three oscillators per voice plus LFOs with a variety of 9 continuously variable waveforms. That's simply unrivaled flexibility! Use the 2 filters with 13 filter types in series or parallel. Includes Frequency and Cutoff (Poly Mod) modulation. Enjoy realtime control of every parameter simultaneously with MIDI! You even get 1,000 classic analog patches to get you going right away.



**Native Power Packs**

Waves is the most respected name in audio processing plug-ins. Once available only to the fortunate few, they've brought their delicious line of processors to Windows native audio in

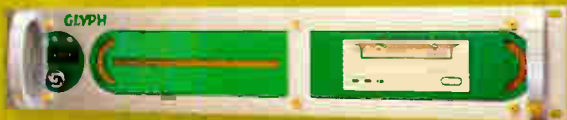
two great Native Power Pack bundles. Get both for a comprehensive collection of extreme fidelity software processors. Compatible with all the top Windows audio programs including Cubase VST, Sound Forge and WaveLab.

**Native Power Pack I—Legendary Waves processors:**

- TrueVerb—virtual space reverb and distance processor
- Q10—Parametric Equalizer—the "Swiss-Army knife" EQ!
- C1—Compressor/Gate—frequency specific compression!
- S1—Stereo Image—for "safe" stereo enhancement!
- L1—Ultremaximizer—industry standard mastering limiter!

**Native Power Pack II—acclaimed Renaissance plug-ins:**

- Renaissance Compressor—warm sound and simple operation!
- Renaissance Equalizer—an amazingly musical, transparent EQ!
- MaxxBass—the ultimate bass enhancer!
- De-esser—dedicated de-esser, high-frequency reducer!



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To get maximum results from your Windows MID/Audio system, you need a dedicated, reliable drive. Only Glyph has the dedication to audio necessary to earn our highest recommendations.

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World Radio History

# AUDIO PRECISION PORTABLE ONE

## TROUBLESHOOTING TIPS

Audio Precision introduced the System One in 1985 and the Portable One in 1990. Since then, many features and new capabilities have been added. Here are a few handy analog measurement tips for the Portable One.

The connection between your test equipment and whatever you are measuring is incredibly important. Leads should be well-made and checked regularly. One of the more useful adapters is a set of XLRs to alligator clips, which can

Check out how your synth-to-console connection is working by running the generator at 600 $\Omega$ .

### GENERATOR LOAD TEST

A common problem in studios with "vintage" equipment and newer gear is "loading." The input impedance of older equipment may be as low as 600 $\Omega$ , or even 150 $\Omega$ . Almost all equipment made today has inputs that are high-impedance "bridging" or "non-loading." Many things made today are not able to drive loads that are not bridging. Gen. Load will help find these problem inputs quickly. Older mic pre-amps can be switched or strapped for various input impedances. A 50 $\Omega$  ribbon microphone will be quieter and have more gain looking into a 300 $\Omega$  load, though most microphones you encounter today will do better with the 1,200 $\Omega$  setting or higher.

Another Gen. Load test will identify capacitive loading problems in the stereo mix distribution setup. If a console mix bus is mulded and normaled to several machines, use Gen. Test to feed into that distribution. Go into Sweep mode and look at Gen. Load vs. Frequency. It is common to find that at midband (around 1 kHz) the load is sitting at 4-5 k $\Omega$ . At 10 kHz it could be as low as 1,000 $\Omega$ , and at 20 kHz it might be half of that. DAT machine inputs are often the worst offenders, and the common practice of mulding out to a number of machines causes problems quickly. Find the problem with Gen. Load, and you may be able to mod the gear or convince someone to invest in a good distribution amplifier.

### USE YOUR EARS

Don't forget that other valuable test equipment—your ears. Listen to the

monitor output of the distortion analyzer. Let's say you are presented with two of the same item to compare—one marked "Sounds Good" and the other labeled "Sucks." Frequency response, noise and distortion measurement numbers are pretty much the same, but the two items do sound different. Older gear may make noises even when healthy, but in this case the higher odd-order harmonic and inharmonic distortion, switching transients, artifacts from poorly biased push-pull outputs and other obnoxious distortions and noises are clearly audible in the total distortion content. The overall contribution of these distortion products may not significantly affect the overall Total Harmonic Distortion plus Noise number, but you can hear it in the distortion analyzer monitor output. If you use this technique, you can train yourself to recognize problems from the sound of the distortion.

### NOISE MEASUREMENT PAGE

In the Noise Measurement page you can select a  $\frac{1}{2}$ -octave selective filter and focus on noise within that band. This is very helpful when you are working on getting good erase depth in tape machines, or when you are measuring things like fader kill attenuation in a console. Go into Sweep mode from the Noise page after you have set the filter to Selective and you can plot a readable noise spectrum. Because you are looking through a  $\frac{1}{2}$ -octave filter, you will see humps of noise rather than single frequencies, but the display is still quite useful. If you want to measure your progress in reducing PSU noise, you can get better and more accurate numbers by using the selective filter than you will by measuring wide-band. ■

*John Klett is a system/product designer and gear mod/maintenance expert based in Manhattan. Visit his company, Singularity Enterprises, at [www.singularity.com](http://www.singularity.com).*



be used to measure voltage summing bus levels in vintage consoles directly and inject signals into various points of the signal path to locate problems quickly.

### IMPEDANCE LOADING

Always check your generator impedance settings. The output impedance has to be appropriate to the device being tested. For example, the TAB V-76 mic preamp was specifically designed for a 200 $\Omega$  source and has an input transformer with a large step-up turns ratio. If you measure the TAB V-76 with the generator set to 40 $\Omega$ , you will see a bump at both ends of the response curve. If you measure with the generator set to 600 $\Omega$ , the top and bottom roll off severely. The 40 $\Omega$  balanced generator output is most like a well-designed line level output should be, but a lot of keyboards and samplers have quite high source impedances.

BY JOHN KLETT



# NEW VLZ PRO™. THE FIRST COMPACT MIXERS WITH ESOTERIC MIC PREAMP SPECS AND SOUND QUALITY.

**Y**ou won't find any other mixer manufacturer admitting this dirty little truth: For years, expensive outboard mic preamplifiers have yielded better sound than the preamps in any size mixing console including "status mega-consoles." In fact, if you happen to have numerous extra thousands in cash lying around, we urge you buy an esoteric mic preamp or two or three right now.

■ But if your equipment budget is slightly more down-to-earth, we'd like you to enjoy the benefits of the

most extensive analog engineering project in Mackie's history: The new XDR™ Extended Dynamic Range mic preamplifier.

■ Now for the first time, you can realize the full potential of the world's finest condenser microphones with an affordable compact mixer: Room ambiance so detailed you can practically hear the carpet pattern...high frequency resolution that defines cymbals, triangles and bells down to the molecular level... midrange that's as gentle and fluid as a warm bath...and tight, authoritative bass with intoxicatingly rich harmonic texture. In short, you can now achieve an aural panorama that's breathtakingly realistic, excitingly vivid and truly 3-dimensional.

■ You probably think we're laying it on a little thick—until you hear the XDR™ mic preamplifier in person. It really does have...

- The **lowest harmonic distortion** of any compact mixer mic preamp in existence (for example, ten times less THD than our previous VLZ™ series).
- **Lower Equivalent Input Noise** in the critical +20--+30dB operating range than most \$2000 preamps.
- **Over 130dB of dynamic range** to handle hot 24-bit/196kHz outputs from digital audio workstations.
- **Astonishing bandwidth** without RFI side effects. Not only are XDR™ mic

preamps flat within 1/10<sup>th</sup> of a dB across the bandwidth of any known microphone but they're only 3dB down at 1Hz and 192kHz!



**Warm, natural sound**  
**0.0007% THD**  
**130dB dynamic range to handle 24-bit/196k digital input sources**  
**Lowest E.I.N. at real world gain settings**  
**Impedance independent**  
**Near DC-to-light bandwidth**  
**The best RFI rejection of any compact mixers in the world**

- **Controlled Impedance Interface.** Use the XDR™ mic preamp with mic/cable impedance combinations anywhere from 50 to 600 ohms and get the same ruler-flat frequency response.
- There are also XDR™ benefits you won't hear:
- **The best RFI** (radio frequency interference) **rejection** of any compact mixer... without attenuating high frequency response.
- Comprehensive **protection against "hot patching" and short circuit damage** — a

critical feature even some high-end mic preamps lack.

■ The mixers are pretty cool, too. XDR™ mic preamps are the latest major enhancement to our industry-standard CR1604, MS1402 and MS1202. For more information, call toll-free, log onto our web site or visit your nearest Mackie Dealer and hear the new VLZ™ PRO Series. Think of them as \$2000 mic preamps with superb mixers attached.



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## MS1402-VLZ™ PRO

6 XDR™ mic preamps  
 14x2 • 4 stereo line inputs • 6 mono mic/line inputs • extra ALT 3-4 stereo bus



## CR1604-VLZ™ PRO

16 XDR™ micpreamps  
 16x4x2 • 16 mono mic line inputs • 4 sub groups • rotatable I/O pod



## MS1202-VLZ™ PRO

4 XDR™ mic preamps  
 12x2 • 4 stereo line inputs • 4 mono mic/line inputs • extra ALT 3-4 stereo bus



**CYNIC'S CORNER.** Did we just slap a new buzzword on our "old" VLZ mixers? **Emphatically NO!** We spent two years and a quarter of a million dollars to produce the first no-compromise mixer microphone preamplifier design. XDR™ is a quantum leap ahead of anything but the most expensive outboard mic preamps. Plug a high-quality condenser mic into a VLZ Pro compact mixer and you'll hear the difference. Run a side-by-side comparison with a \$1000-per-channel esoteric mic preamp and you'll be blown away.

CIRCLE #160 ON PRODUCT INFO CARD

# The First Integrated Professional 5.1 Monitoring System With THX® Approval

## No Off the Shelf Parts. No Off the Shelf Thinking.

The All-New JBL LSR Monitors are, quite literally, just that. Highlighted by a long list of performance-tailored components and customer-inspired features, they're like no other systems on the market today. The entire line, including the LSR32 3-way, 28P 2-way and 12P Subwoofer, is a technical triumph; resulting in new standards and performance levels for a rapidly emerging multi-channel recording industry.

## Performance-Tailored Components

Revolutionary transducer designs, optimized network topologies and innovative materials are some of the reasons why the LSR line is being hailed as 'the world's most advanced monitor'. JBL's all-new *Differential Drive*® woofer permanently dispels the notion that better linearity, higher power handling and greater dynamic accuracy are somehow an unobtainable, evil triangle. *Dynamic braking* produces truly accurate bass at higher SPL's with maximum reliability. Composite materials, including *Carbon Fiber* in the woofer as well as *Titanium* and *Kevlar*® in the high and mid frequency components, insures performance that is always optimally maintained.

## Not Just A Better Spec... A Better Monitoring System

While all companies boast about their specifications, JBL went one step further. To guarantee that every component of the LSR family worked together for optimal performance, LSR development employed JBL's unique 'system-engineered' design philosophy. Simply put: the entire line was researched and refined as one, with an overall performance goal in sight. What this means to you is a monitor and subwoofer that work together as a system; delivering stunningly uniform and accurate performance in both stereo and multi-channel applications.



### LSR 32

12" 3-way mid-field monitor with rotatable Mid/High Elements.



### LSR 28P

8" 2-way close field monitor with bi-amplification and active filtering.



### LSR 12P

12" Active Subwoofer with Bass Management System.

Carbon Fiber Composite Cone

Dual Top Plate

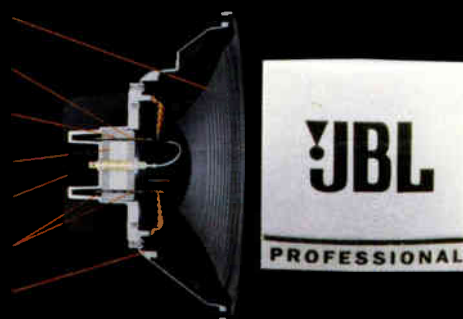
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Neodymium Magnet

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Dual Drive Coils

Diecast Frame



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World Radio History