

MIX

PROFESSIONAL RECORDING RESOURCES AND MUSIC PRODUCTION

**Multitracking:
Making the
Tape-to-Disk
Transition**

**New Mic
Preamps**

**Touring
Loudspeakers:
More for Less**

**Multichannel
Music Mixing**

World Radio History

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Eight hybrid/discrete mic preamps offer excellent audio quality, low noise and plenty of output power (60dB of gain).

Two aux sends on each channel. Aux 1 is pre-fader for phones or monitor sends; Aux 2 is post-fader for effects.

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The best feature of our new mic preamp is the mixer.

It may look like a mixer. But when we designed the Alesis Studio 12R™, we implemented eight of the best-sounding microphone preamps available. In addition to high sonic quality and low noise, our mic preamps provide more than enough gain to really take advantage of digital recorders (like our ADAT-XT™).

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Check out the new Studio 12R at your Alesis Dealer. You won't find a more versatile or affordable mic preamp...or mixer, for that matter.

STUDIO 12R

MIXER / MICROPHONE PREAMPLIFIER

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ACTIVE MONITOR SERIES

Perspective Monitoring

Two Pros And Their Tannoys...

Five centuries ago, Leonardo da Vinci brought art and science together to create beautiful images using his knowledge of engineering, physics, geometry and perspective. • His images were so clearly rendered, so precisely represented, that the mechanisms he drew then could be recreated today. • Da Vinci maintained that the artist had to use the methods of science, and the scientist the tools of art. • Now, five hundred years later, Tannoy once again blends science and art to deliver the world's most advanced monitoring systems.

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

• Beginning with the precise phase coherent drive units, the AMS series builds on Tannoy's unrivaled reputation for accurate imaging perspective. • Active monitors provide unparalleled

low frequency accuracy, due to the extremely low impedance coupling of the amplifier and drive units, and the elimination of parasitic passive crossover elements. • Precise tailoring of the active filter elements allow matching of production tolerances to within 0.25dB, guaranteeing superb stereo imaging. • The amplifiers use aero-space tolerance components and design, with the components selected for their sonic qualities as much as their reliability.

• The amplifiers are truly unlimited in performance to

ensure that there is no coloration of dynamics due to over-protective protection circuitry.

■ These are studio monitors designed to step aside and let you inside the musical perspective.



Joe Chiccarelli, Producer credits include:

- Tori Amos • Frank Zappa
- American Music Club
- Cracker • Dog's Eye View

"It's the first time I've used a near field monitor where I felt like there wasn't any glass between the control room and the artist. The transparency and phase coherency of the midrange allows you to move a microphone a quarter of an inch and truly hear the difference, a remarkable achievement."

photo courtesy of Royaltone studios

• All of the specifications and hype in the world cannot replace a real life encounter with the Tannoy Active Monitor Series.



• We guarantee that your smile will be bigger than the Mona Lisa's, and your art—who knows—even more famous!

Mick Guzauski, Producer • credits include:

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"I have relied on Tannoy point source Dual Concentric loudspeakers for several years. Their resolution of time and space put them in a league of their own. Now with the advantage of state of the art filtering and amplification, the overall precision of the image and critical damping factor makes them an unbeatable combination at any price."

• Through the exacting application of science, the AMS monitors provide the accurate perspective to clearly



When we designed the PCM 80's basic complement of effects Presets, we also provided the ability to plug in hot, new Audio Software/FX cards. Simply plug in any of our cards and you've now supercharged the effects processor everybody is talking about. New effects and algorithms. Hundreds of stunning new Presets. Sophisticated PC-Card architecture that supports our commitment to functionality and continuing upgradability.

PCM 80 FX cards offer a library of over 700 new Presets — each one tailored for a particular application - with a unique Adjust Knob that lets you quickly audition variations of the effect. We put the most useful parameters of each preset into the PCM 80's "Soft Row" so you can fine tune the Preset without having to hunt for the appropriate parameters. Engineer or



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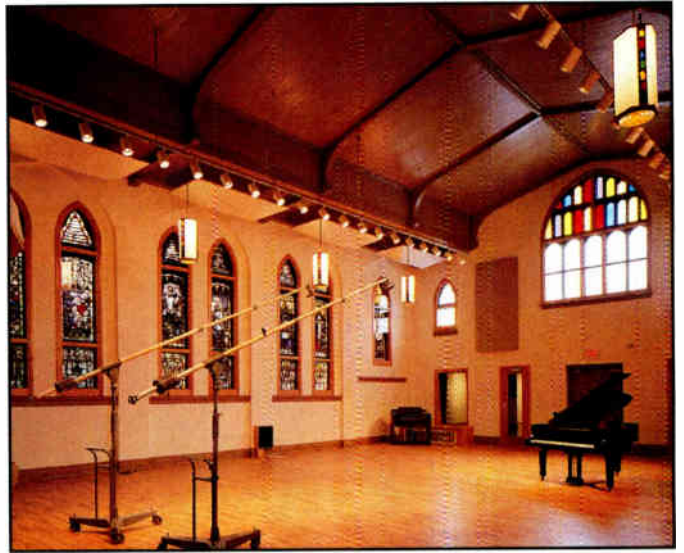
MIX[®]

PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

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Check out Mix Online
<http://www.mixmag.com>

Cover: American Sector Recording Studios in New Orleans, housed in a former Masonic lodge, features a new SSL 4064 G Plus with Ultimotion and a full line of API and Neve mic preamps and EQs. The facility opened in April 1996, maintaining the original Egyptian motifs and plaster work from 1922. Design was by Michael Blackmer; acoustics by Bob Hodas. Main monitors are Dynaudio Acoustics M3s; analog recording is to Studer B27 and Ampex ATR 102. **Photo:** Jackson Hill, Southern Lights Studio. **Inset:** Steve Jennings.



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Now:

Audiowerk8, Emagic's new PCI based digital audio recording card, makes hard disk recording as easy as tape. With 8 discrete outputs, stereo analog ins and digital I/O, solutions are solutions without exceptions. Shipping with VMR, the "Virtual Multitrack Recorder", software so transparent, the manual is included in this ad. And for your growing studio needs, Audiowerk8 is fully compatible with the Logic Audio production system. The choice is simple, with a list price of \$ 799.- creative expression with professional results is now affordable to all.

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



Introducing Audiowerk8,
the affordable 8 Channel Digital Audio
Recording PCI Card featuring:

- 2 analog IN and 8 discrete Outputs
- Professional Quality A/D-D/A Converters
- Stereo Digital I/O (S/P-DIF)
- Easy Installation and Operation
- Up to 8 Tracks with VMR-Software
- Up to 20 Tracks with Logic Audio Software
- PCI Busmaster Technology for maximum System Performance



MacOS and Windows '95 compatible.

1. Tracks

Play back eight tracks while recording two additional tracks. You can name each track and access a virtually unlimited number of alternative takes.

2. High Definition Level Meters

Allows you to accurately monitor the levels of your recordings on each track.

3. Left and Right Locator Displays

Shows you the currently selected in/out points. Values can be easily edited with click/drag mouse operation. Values can be readily selected and dragged into any of the 20 positions in the Position Memory bank and vice versa.

4. Cycle Button

Enables cycle playback and record between the left and right locators.

5. Track Switches

Besides the standard switches such as Solo, Mute and Record, the Stereo Buttons allow you to group 2 tracks together as one track for easy handling.

6. Wave Display

The positive waveforms of your recorded tracks smoothly scroll from right to left during playback and recording. This allows you to easily navigate through your recordings.

7. Set-Locator Button

These buttons allow you to write the current "tape" position into the locator displays on the fly. Controllable either with the mouse or with a keystroke, these buttons allow you to quickly generate new left and right locators.

8. Tape Indicator

Indicates how much space or "tape length" you have left for your recording. It also indicates your current position within the recording.

9. Auto Drop Button

With this button enabled, the VMR will automatically switch to record mode using the currently displayed left locator as record IN and the right locator as record OUT.

10. Tape Button

You'll need to choose a "tape" before making your first recording. Pressing this button gives you a variety of tape length options depending on the size of your hard drive.

11. Copy Button

This button allows you to copy, move or mixdown the data of "soloed" source tracks between the left and right locators to the tape position on a record enabled destination track.

12. Input Selector

Press "A" to choose the Analog Input, or "D" to choose the Digital Input on your Audiowerk8 Card.

13. Pitch Variation

Clicking on this button opens a display where you can simply enter the desired pitch value by clicking and dragging. Pitch ranges are from -9.99% to +9.99% in steps of 0.01%.

14. Position Memory Bank

Up to 24 positions can be stored with each tape. 6 can be displayed simultaneously. To view others, simply click on the slider and drag left or right. Clicking on the "pair" button between 2 position memories gives you a "pair selection" which can be dragged into both locator displays simultaneously. Position memories can also be set and recalled via keystrokes.

15. Position Display

Optimized for legibility, the position display shows you the current tape position. A maximum tape length of 1 hour, 59 minutes and 59.59 seconds can be displayed.

16. Tape Controls

As simple to use as the controls of any conventional multitrack tape recorder.

VMR "Virtual Multitrack Recorder" Software, included with Audiowerk8, Emagic's new 8 Channel Digital Audio Recording PCI Card.



Easy entry - Easy upgrade:

The Audiowerk8 is an integral part of the Logic Audio System. You can add complete MIDI Sequencing, Scoring and Professional Audio Editing Features including Realtime DSP.

This turnkey solution is your easy introduction to Digital Multitrack Audio Recording.

Along with advanced Audio Recording, Realtime DSP and Editing you also get an integrated Sequencing and Scoring Solution.

The Ultimate Music Production System including Realtime DSP, Sample Editing, Virtual Mixing, professional Scoring and more...

The Audiowerk8 will be available in early March at leading music retailers. The suggested retail price is \$799.- including the Virtual Multitrack Recorder Software. For more information about Audiowerk8, system requirements and all available upgrade options please visit our webpage or give us a call.

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FROM THE EDITOR

DIGITAL REVOLUTION (NUMBER 9)

Pontificators of all breeds—scholars and journalists alike—enjoy classifying historical eras with neatly defined labels. And when these times coincide with the dates of major events (1066, 1492, 1776, 1812, 1941, etc.), so much the better, because this simplifies the pigeonholing process.

Unfortunately, technology doesn't work that way. When Orville and Wilbur Wright first flew a self-powered aircraft over Kitty Hawk, the radical era that followed changed the lives of every person on this planet. Yet, 1903, the date of one of the most significant technology events in history, bears little meaning to schoolchildren who somehow can recall the "Tippecanoe and Tyler Too" campaign slogan of our tenth president, as if that ever mattered to anyone.

In another example, consider Johannes Gutenberg's invention of movable type. Nobody knows the exact date when this occurred, yet there is no question that with the ensuing availability of affordable books, he irrevocably altered the course of human existence.

The point is that technology is more evolution than revolution. The effects coming out of breakthroughs occur gradually, over time, as is the case in digital audio. Commercial digital audio devices have been around for a quarter-century, since the debut of the Lexicon/Gotham Delta T-101. One simple 10kHz bandwidth delay hardly begets a revolution, yet in the following years, pioneering systems came along from Soundstream, 3M, NED, Fairlight and Sony. With the advent of the CD format, MIDI, DAT, ProDigi and DASH multitracks, and DAWs, digital became established in the lives of working pros everywhere. And today, with the availability of MDMs, low-cost digital consoles and workstations, the once-impossible is now the affordable.

And as this evolution continues, we still struggle with choices—what to buy, what to use and what format provides the speed, reliability, media interchange and robust archiving we need. There are no easy answers. In this issue, Sarah Jones talks to engineers on the subject of making the tape-to-disk transition in the production environment; Chris Michie examines approaches to mixing for multichannel release formats; and Bob Katz explains optimizing levels for digital recording. For the novice or pro, learning never stops.

The future holds yet more surprises: high-bit/high-sample-rate audio, new formats, new toys, new technologies, new opportunities. I have a feeling that the real revolution is just beginning.

See you there,



George Petersen

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by David Schwartz and Penny Riker Jacob



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record



CURRENT

WELCOME TO AES EUROPE!

This month, thousands of audio professionals will converge in Munich for the 102nd AES convention. The show takes place at the Munich Order Center, March 22-25. This year's program is one of the most intensive of any AES convention: More than 100 technical papers, 14 workshops, an education fair, nine technical tours and several social events and activities are scheduled, in addition to the educational forum and technical and standards committee meetings. Special events planned include a visit to the Munich IMAX for the showing of "New York 3-D—Eine Zeitreise (A Space Journey)," and an organ recital at St. Michael's Church featuring Soundcraft technical director Graham Blyth and St. Michael's organist Elmar Schloter. Don't miss the "unconventional Convention banquet" at the *Löwenbräukeller* in the heart of Munich.

The convention will begin with the Opening Ceremony on March 22, at 9:30 a.m.; exhibit hours are 10 a.m. to 6 p.m., Saturday through Monday, and 10 a.m. to 5 p.m. on Tuesday. For more convention information on registration and special events, visit www.aes.org or call 212/661-8528.

CLAIR BROTHERS ACQUIRES MD SYSTEMS

Clair Bros. Audio, of Lititz, Pa., has purchased Nashville-based MD Systems. The acquisition price was unavailable—both companies are privately held; however, it was confirmed that the agreement was in the seven-figure range. The sale gives Clair Bros., one of the largest sound reinforcement companies in the world, enhanced clout in the country music touring market. According to MD Systems founder and sole owner John McBride, who will remain as manager of MD Systems, that company will be left intact and will likely operate as a wholly owned subsidiary of Clair Bros. According to Clair Bros. manager for corporate services, Mike Wolf, the Clair Bros. Nashville office, opened in 1995 and headed by Steve McCale, has already been moved into the MD Systems facility. "This will enable Clair Bros. to offer a wider

range of services and resources to the touring industry," Wolf said. MD Systems was founded in 1980 with \$6,000 that McBride had borrowed. Since then it has grown to become the largest Nashville-based SR company, with eight arena-level systems on the road in 1996 with artists including Garth Brooks, Tracy Lawrence, Pam Tillis, Green Day and Sheryl Crow. "We're very happy and excited about the future of both companies in Nashville," McBride said. "There's been a lot of doom and gloom forecasted about [the country music market], but to this point we haven't noticed any slowdown in business."

—Dan Daley

HEADSPACE ACQUIRES IGOR LABS

Headspace Inc., a provider of Internet and multimedia audio content and technology, recently acquired Igor Software Laboratories of Livermore, Calif. Under the terms of the agreement, Igor Labs has exchanged 100% of its stock for an undisclosed sum plus an equity stake in Headspace.

Headspace plans to integrate Igor Labs' audio driver technology into its product line, and Igor's key architects, Steve Hales and Jim Nitchals, will work

at Headspace's San Mateo, Calif., headquarters, with Steve Hales assuming the role of director of audio technologies. According to Headspace, the acquisition of Igor Labs will strengthen the Headspace audio engine; the newly expanded company plans to market a powerful new cross-platform engine soon.

BEHRINGER PAYS DAMAGES ON APHEX PATENT INFRINGEMENT

Aphex Systems Ltd. (Sun Valley, Calif.) and AKG Acoustics-Munich announced the settlement of their claims against Behringer (Syosset, N.Y.) for patent infringement on the Aphex Aural Exciter for approximately \$450,000.

In August, 1992, Behringer was found guilty of the original patent suit filed in Germany in 1987. After the German courts awarded what was viewed by Aphex and AKG as an unacceptably low settlement, the two firms filed an additional law suit for recovery of damages amounting to \$910,000. The court recently awarded half that claim.

RHODES RECAPTURES TRADEMARK

Inventor Harold B. Rhodes regained the worldwide rights to the Rhodes trade-

—CONTINUED ON PAGE 12

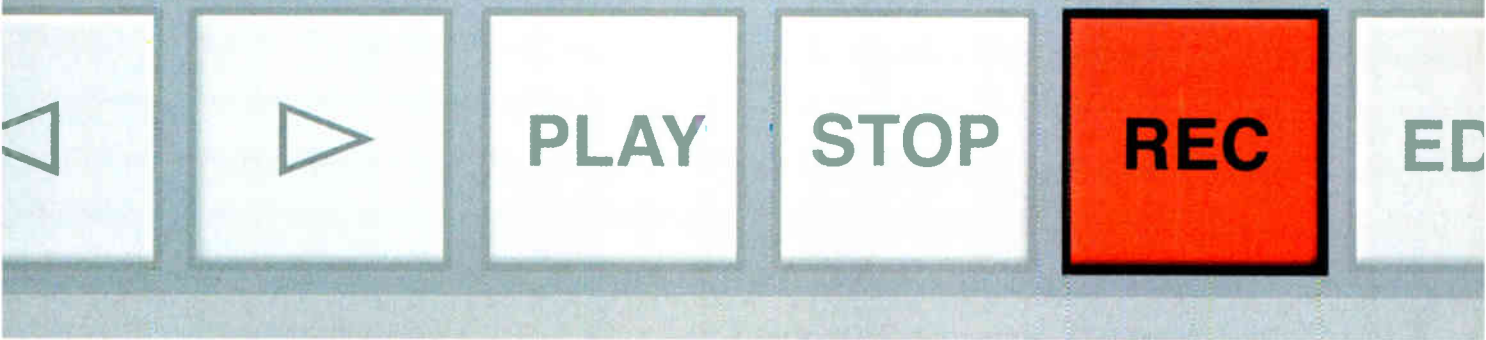
TEC AWARDS DISTRIBUTE PROCEEDS

The Mix Foundation for Excellence in Audio announced the distribution of proceeds from the Twelfth Annual Technical Excellence & Creativity Awards, held last November 9 at the Regal Biltmore in Los Angeles.

In January, \$30,250 was presented to organizations involved in the prevention and treatment of hearing impairment and to scholarship programs for students of the audio arts and sciences. Fifty percent of the proceeds was donated to the Hearing is Priceless campaign of the House Ear Institute of Los Angeles, which educates the public, especially young people, about the danger of noise-induced hearing loss. Ten percent was given

to SPARS audio scholarship programs; 10% was awarded to the AES Educational Foundation; 5% went to the Hearing Education Awareness for Rockers (H.E.A.R.) of San Francisco; and 20% was divided among Berklee College of Music, Full Sail Real World Education, the Institute of Audio Research, Middle Tennessee State University, University of Massachusetts at Lowell, University of Miami and the University of Southern California. The remaining funds were awarded to the two recipients of the TEC Awards Scholarship Grant, Daniel J. Overholt and Erik Todd Lutkins (see "Current," December '96).

For information about the 1997 TEC Awards, contact Karen Dunn at 510/939-6149.



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World Radio History

INDUSTRY NOTES

Mark IV Audio (Buchanan, MI) appointed **Charlie Winkler** to the post of vice president, pro audio group. Other Mark IV Audio appointments: **Steve Dupaix** was named director of marketing of RF products and **Mike Maloney** was named market development manager for music products...**David Scheirman** joined **JBL Professional** (Northridge, CA) as director of tour sound marketing... Woodland Hills, CA-based **Spatializer Audio Laboratories** promoted **Maria Hermanussen** and **Theodore C. Tanner Jr.** to vice presidents of the company's audio subsidiary, **Desper Products Inc.**...**Aphex Systems**, headquartered in Sun Valley, CA, brought on **Garry Greth** as sales engineer...**Lexicon Inc.** announced the completion of a move to larger facilities, located at 3 Oak Park, Bedford, MA 01730-1441; phone 617/280-0300; fax 617/280-0490... Calgary, Alberta-based **QSound Labs** hired **RiCharde & Company** to distribute its **Digidesign** plug-in products...**Group One**, headquartered in Farmingdale, NY, took over international distribution for **KRK Systems** (Huntington Beach, CA). In other Group One news, **Network Pro Marketing** and **The Rep Company** are its newest sales representative firms... **Berkley Integrated Audio Software** (BIAS), based in Sausalito, CA, named **Andrew Calvo** to the newly created position of director of sales...**The Harman Music Group** (Sandy, UT) appointed **Brad Jensen** to the post of technical marketing communications for **dbx Professional Products** and **James Homes** as marketing coordinator/designer for **dbx** and **Allen & Heath**. **Harman Pro North America** in Nashville named **Paul Freudenberg** as national sales and marketing manager, **Stephane Ecalle** as sales engineer and **Arthur Sloatman** as audio lead service technician for the **BSS Audio** division...**Korg USA** has moved. The new address is 316 South Service Road, Melville, NY 11747;

phone 516/333-9100; fax 516/333-9108...**Michael Marans** joined **Event Electronics** (Santa Barbara, CA) as vice president of business development...**Meyer Sound Labs** in Berkeley, CA, hired **Rick Coleman** as southeast regional sales manager...**Celestion International Ltd.** (Ipswich, Suffolk) formed the **Celestion Professional** division, headed by **Richard Wear**, to handle P.A. and component business. In the U.S., **Knut Rosness** was appointed CEO of **KH America** (Holliston, MA), the domestic distributor of **Celestion**, **KEF** and **NAD**; in addition, **Bill Fox** was promoted to sales and marketing coordinator...**Bernie Wu** joined **Irvine, CA-based Pinnacle Micro** as vice president of marketing...Japanese distribution companies **SCJ/AKG** and **Studer Japan** merged. The new company, based in Tokyo, will retain the **Studer Japan** name and be headed up by **Hiroyuki Ikeuchi**...**Pacific Microsonics/HDCD** (Berkeley, CA) named **Betsy Alexander** director of label and artist relations... **E. Dean Jones II** joined **Rank Video Services America** as vice president of marketing...**The Society of Broadcast Engineers** (SBE), based in Indianapolis, named **Linda Goodby** as certification director...**PreSonus** (Baton Rouge) president **Jim Odom** was awarded **Innovator of the Year** by the Louisiana Partnership for Technology and Innovation...Nashville-based **Speer Communications Ltd.** named **Beth Grace** as chief operating officer...**Selenium Loudspeakers S.A.** (Nova Santa Rita, Brazil) appointed **Gordon Peter Gerstheimer** as export manager...**Marshall Long Acoustics** is celebrating its 25th year in business...**Bag End Loudspeakers** announced a 6,000-square-foot expansion of its warehouse facilities in Barrington, IL...**Sennheiser Electronic Corporation** (Old Lyme, CT) named **First Choice Marketing** in Seattle as its 1996 Rep of the Year. ■

—FROM PAGE 10, CURRENT

mark from **Roland Corporation** of Japan. **Rhodes** was assisted by **Joseph Brandstetter**, president and CEO of **Rhodes Educational Systems**, in recapturing the trademark for the famous electric piano name. "After almost 40 years, the great **Rhodes** name is back where it belongs," says **Brandstetter**. "We look forward to bringing new innovative ideas to the music world."

SHOWS NEXT MONTH

The **National Association of Broadcasters** show returns to Las Vegas next month (April 5-10), with a radio/audio hall at the Las Vegas Convention Center and a second radio/audio exhibit area at the Sands Expo Center. For information on **NAB '97** and **NAB MultiMedia World** events, phone 202/429-5350.

The **NSCA Expo '97**, "Uniting electronic technologies for the new millennium," will take place from April 18-20 in Charlotte, North Carolina. For details, including information on the first annual **Jason Perlman Memorial Charity Golf Tournament** happening April 17, call 800/446-6722.

WEB DEBUTS

Allen & Heath's Web debut: www.allen-heath.com

Audio Upgrades changed its URL: home.earthlink.net/~jwilliams3/

Carver Pro Audio premieres www.carverpro.com

Furman Audio debuts a home page at www.furmansound.com

Mcmix Production Services: www.mcmix.com

The **Rock & Roll Society** page is at www.rocknrollsociety.com

Sonic Solution's updated site: www.sonic.com

Sound on Sound introduces a Web site at www.soundonsoundstudios.com

Studio 440 Architecture & Acoustics announces: www.studio440.com

TMA-1 (The Music Area) can be found at www.apcg.demon.co.uk

Yamaha Guitar launches a site at www.yamahaguitars.com

CORRECTION

The January "Industry Notes" mistakenly identified **Mike Cantwell's** position at **Quantegy Inc.** Mr. Cantwell is vice president and chief financial officer. ■

CHECK OUT THIS MONTH'S
MIX ONLINE!
<http://www.mixmag.com>

A Legacy of Great Performance

Sennheiser and the Hollywood Bowl

Joseph Magee, a sound designer for the Hollywood Bowl, insists upon the precision German engineering of the MD 421 II. "It's faster, more open and transparent, yet it retains the timbre of the MD 421."

The superb directionality and freedom from distortion to more than 175dB SPL provide the versatility and control to capture every performance. And its renowned rugged construction secures your investment. The MD 421 II is built to even closer tolerances to consistently deliver the classic Sennheiser sound.

Contact your dealer for a personal demonstration or call us directly.

In addition to being a sound designer for the Hollywood Bowl Joseph Magee records and mixes for film, and in 1995 received a Grammy nomination as a producer/engineer.

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Then say hello to Roland's new JV-2080 Synthesizer Module. It's the latest evolution in the world's most popular line of sound modules.

With 8 expansion slots, the JV-2080 sets a new standard for user-expandability, giving you access to more than 2,900 patches when fully expanded. To



The large LCD and Patch Finder make it easy to locate and audition any patch in seconds

help you take advantage of all these classic Roland sounds, we've added the Patch Finder so you can hear and audition only strings when you need strings, separate your basses from your brasses and quickly locate any of your favorite internal or expansion patches.

Once you've selected those perfect patches, the JV-2080's 64 voices, 3 simultaneous



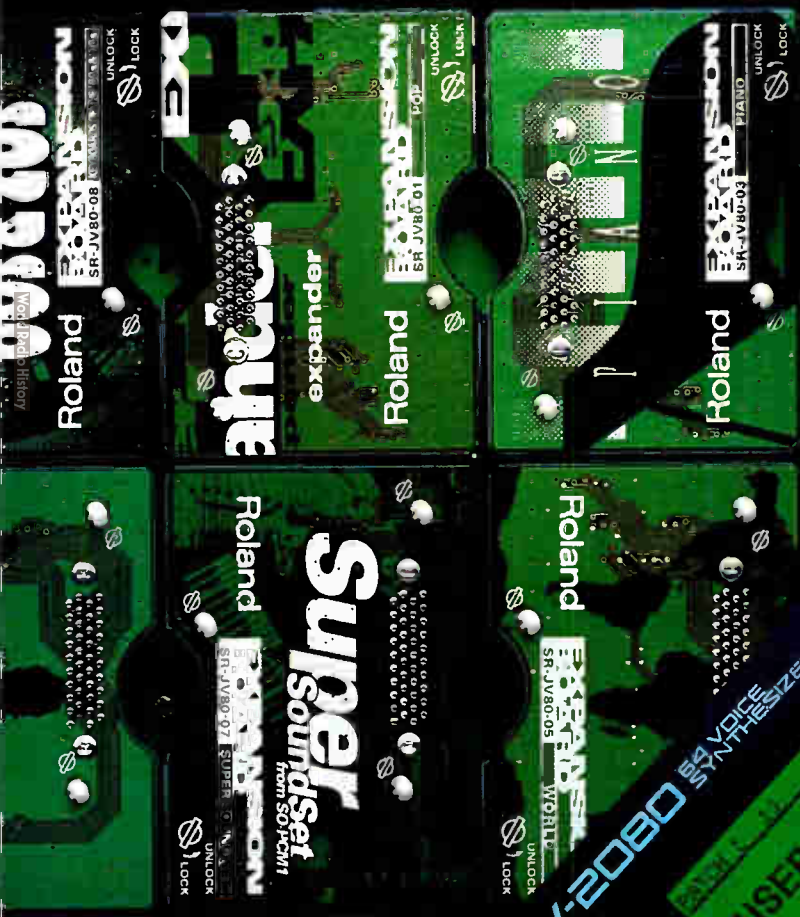
Use 3 insert effects simultaneously, each with 40 effects selections in addition to reverb and chorus

insert effects and 3 stereo outputs provide a flexible production environment that just may leave you speechless. So check out the JV-2080 at your local Roland dealer. And to audition the full line of Roland Expansion Boards, call (800) 386-7575 ext. 753 to get our Expansion Board demo CD (\$5.00). Chances are, you won't stay silent long.



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THE WORD ACCORDING TO BINARY

Digital recording. It's like electricity; those who have it can't remember what life was like without it, and those who don't have it can't imagine what they are missing. Digital recording is true magic. Now, it should be noted that a wise man once arranged to be quoted as saying, "Magic is simply technology that the observer does not understand," or something like that. Or maybe that was never said, but it is now.

Fifteen years ago, the only people who dared to even dream the digital dream were its own developers. Then around ten years ago, this elite 8-bit club grew to (a somewhat generously named) 16 bits and included a token handful

of bleeding-edge artists and studios. Remember the Sony 601 PCM converter for video transports? How about the Nakamichi DMP-100 integrated same-thing? Simply a reworked video deck for recording PCM digital audio data instead of *Star Trek*. I used that Nak so much that I actually learned to watch the PCM data (remember, it was framed in NTSC video, so you could actually *watch* it on any video monitor) as my main L/R metering. Best meters I ever had!

Anyway, these machines marked the beginning of a spurt of growth that led directly to the 1610. Digital recording in all its brash, edgy wonder was upon us (well, at least

the first ten or 12 bits were, plus or minus 5 dB or so).

Outside of this elite club who knew the word—all the other artists, producers and engineers at that point in digital history's distant past fell into two groups: those who had no hands-on experience with these fledgling PCM recorders and doubted if they would ever really sound right, and those who did have hands-on experience and doubted if they would ever really sound right.

Well, with the 20-bit barrier now broken into tiny (LS) Bits, we are actually getting there! Who of those in our industry around 1980 to '85 woulda' thought it? Now there are offerings in the 24-bit

BY STEPHEN ST. CROIX

—CONTINUED ON PAGE 217



ILLUSTRATION, ADAM McCAULEY



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AMS MULTI-FORMAT PRODUCTION CONSOLE

World's premier music production console

Audio quality against which all other mixing consoles are judged
Level formant spectrum EQ and dynamics in each channel
Mono/4 stereo auxes when tracking, up to 48 auxes when mixing
Master status switching for tracking, mixing and broadcast
Colour TFT screen in meter bridge provides sight-level automation data and Recall displays
Encore automation/mix data interchange with AMS Neve digital consoles

VXS Multi-Format consoles additionally provide

- Monitoring and output configurability
- Up to 8 discrete outputs/4 stereo pairs
- Monitoring independent of main outputs
- Support for three additional 8-track ATRs/dubbers, or 2nd multitrack
- Additional stereo guide track inputs
- Pec/Direct paddle switches for monitor select and record arm
- Optional music and dialogue dual track faders
- Optional assignable joystick panners

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7 REASONS TO BUY OUR TO MIX MORE CREATIVELY,

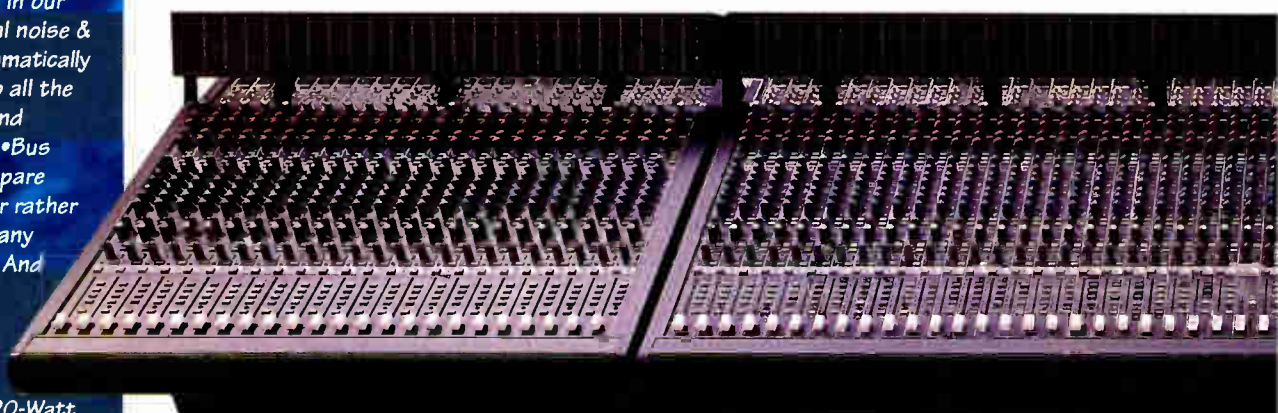
1 **VLZ CIRCUITRY FOR ULTRA-LOW NOISE AND CROSSTALK.** A fancy new name for the same old circuitry? Nope. VLZ (Very Low Impedance) is a Mackie innovation based on solid scientific principles. Through the careful deployment of high operating current and low resistor values at critical points in our consoles, thermal noise & crosstalk are dramatically reduced. Open up all the channels, subs and masters on an 8•Bus console and compare what you hear (or rather don't hear) with any Brand X console. And because VLZ circuitry needs loads of high current, we ship a humongous, 220-Watt power supply with every 8•Bus & 24•E expander.

7 **MAC™ & WINDOWS™ 95-BASED AUTOMATION THAT'S RELIABLE, PROVEN AND AFFORDABLE.** Along with affordable digital multi-track recorders, the Mackie 8•Bus has made it possible to do world-class productions on a modest budget. But until now, Big Studios have still had one remaining and unattainable creative "secret weapon"... computerized level automation. That's why we developed the UltraMix™ Universal Automation System. It gives you fully editable and recallable

2 **IT EXPANDS ALONG WITH YOUR NEEDS AND BUDGET.** You'd be surprised just how many 8•Bus console setups like the one below are currently in use. But you don't have to start out this way. Start out with a 24•8 or 32•8 and then grow your 8•Bus console 24 channels at a time with our 24•E add-on modules. 1, 2 or even 3 of 'em connect in minutes. They come with their own 220-watt power supply; optional meter bridges are available.

3 **IMPECCABLE MIC PREAMPS.** A console can have motorized dooflammers and an optional MIDI espresso attachment, but if the mic preamps aren't good, you don't have a fully-useful production board. Our discrete preamps with large-emitter-geometry transistors have won a critical acclaim for their exceptional headroom, low noise (-129.5dBm E.I.N.) & freedom from coloration. VLZ circuitry in the preamp section also reduces crosstalk.

4 **THIS CONSOLE JUST PLAIN SOUNDS GOOD.** Sure, you may be able to buy a Brand X console for less. But you end up with a console that sounds like...well...a Brand X console. Granted, we're getting into a pretty subjective area here...but we have tall mounds of 8•Bus warranty cards that rave about our consoles' "clarity," "sonic purity," "sweet sound," "transparency," "lack of coloration" and a lot of other superlatives we wish we'd thought of first.



Above: 24•E 24-ch. expander with optional MB•E meter bridge and stand.

Above: 32•8 with optional MB•32 meter bridge and stand.

control of input, channel and master levels – plus features not found on even the most expensive proprietary Mega-Console automation systems. Equally important, it doesn't degrade sound quality, introduce zipper noise or cause audible "stepping." UltraMix is currently being used to mix network television music themes and on several major album projects – by seasoned engineers who grew up on Big Automation Systems. Their verdict is that UltraMix is a serious automation solution – stable, reliable and frankly easier to use than more expensive systems. The basic system controls 34 channels

and can be expanded to as many as 128 channels. UltraMix Pro™ software, for 030/040 & Power PC Macintoshes and PCs (Windows® 95 required), includes a wealth of features like editable fader curves, built-in level display, up to eight subgroups, SMPTE time code display, event editor with pop-up faders, optional control of outboard effects devices, and the ability to play Standard MIDI files from within the program.

UltraMix™ includes the Ultra-34 Interface, UltraPilot Controller and software for \$2797 suggested U.S. retail. Macintosh® or Windows® 95-compatible PC not included.



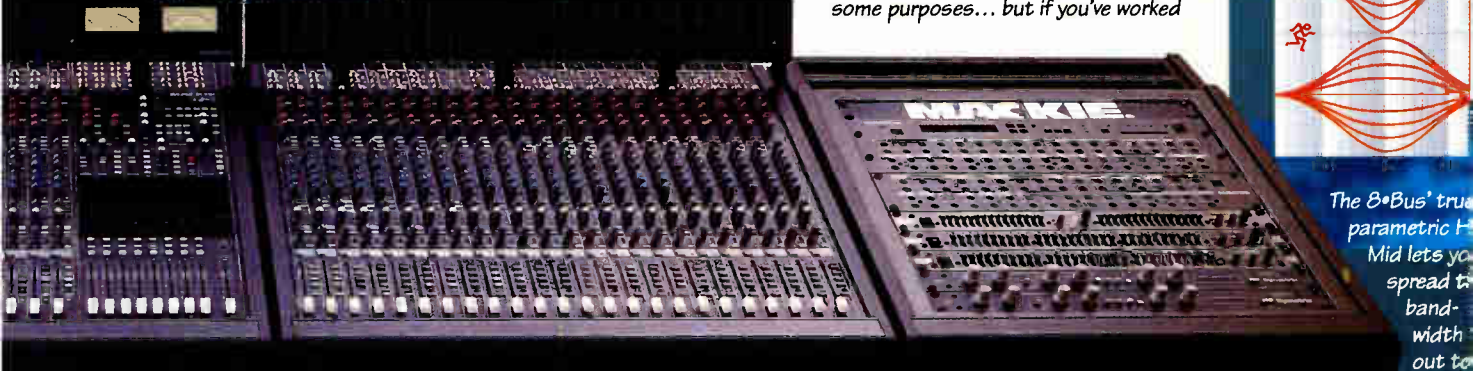
B-BUS CONSOLE... AND 2 TIPS ON HOW TO USE IT EFFICIENTLY AND, WELL, MORE FUNNY.*



5 PROFESSIONALS REALLY USE THEM. The members of Boyz II Men could have afforded any console they wanted for their studio's second room. They chose an 80-input 8-Bus setup with 102 channels of UltraMix™ automation. In the studios of artists as diverse as k.d. lang¹, Yes, Queensryche, Aerosmith, Lee Roy Parnell, Bryan Adams, Carlos Santana, Whitney Houston, Eric Clapton & U2, our consoles really are used to make great music.

6 WIDE MID RANGE EQ. Whether you're tracking or mixing, equalization is one of your most important creative tools. Mackie's 8-Bus consoles feature extremely-wide-bandwidth peaking EQ that can be used to achieve effects that simply aren't possible with narrower EQ. Most Brand X midrange EQs have a fixed bandwidth of about 2 octaves (blue graph at right). You can sweep it up & down the frequency spectrum, but the "sharpness" of the EQ curve is always the same. This kind of EQ is good for some purposes... but if you've worked

with it before, you know it's too drastic and localized for gentle changes in overall tonal coloration.



Above: 24+E 24-ch. expander with optional MD+E meter bridge and stand.

Above: The SideCar, matching 8-Bus equipment rack.

8 WHAT ULTRAMIX AUTOMATION CAN DO FOR YOU:

- Hone a complicated mix one track at a time with every fader move recorded
- Clone your best fader moves and use them in other places in the mix
- Automute unused sections of your tape tracks or noisy MIDI sound modules
- Via automated mute or fader cuts, make a composite mix ("comp track") from the best moments of several tracks of the same vocal or instrument
- Save mixes for recall and editing at any time (great for mixes with music beds or "donuts")
- Make six voice-over versions of a jingle mix – and then easily make the inevitable nitpicky client changes three days later
- Step up to big-league automation without breaking the bank!

9 LEGENDARY RELIABILITY. One of those factors you probably don't think much about – until your console goes down in the middle of a critical late-night session. Built with pride in Woodinville, WA USA, Mackie 8-Bus consoles have an enviable three-year track record for enduring continuous, round-the-clock use and abuse.

The 8-Bus' true parametric Mid lets you spread the bandwidth out to as much as 3 octaves (red curves above). That extra octave of "width" gives you a whole new creative palette.

* Poetic license applied for.
¹ Mention in this ad denotes use only, as reported to Mackie Design, and is in no way intended to constitute official endorsement of the artists or groups listed.



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CAREERS FROM HELL

CONSIDER THE ALTERNATIVES



ILLUSTRATION: RICK SEALOCK

Everybody who's been in this business more than two weeks has their own "Gig From Hell" stories. Singers drooling all over the microphones, record company execs with dubious hygiene abusing everyone in sight, guitar heroes who insist that louder is always better, advertising clients bragging that they can do your job better than you can, producers using the console as an ash tray—the list is endless. Some of my own favorite memories of the genre include the enraged, drunken mob of high-school reunioners who chased my little acoustic trio down a hill when they realized the punk band they thought they'd hired wasn't going to show up; the assistant engineer who filled a kick drum with sandbags but forgot to check that they were tied shut; the synth player who didn't

know where the master tuning control was, and so as the thing warmed up I had to constantly change the tape speed to keep up with its pitch; and the day I was recording a 40-piece steel band outdoors with a dozen brand-new U87s and 414s and a sudden monsoon came up.

But that's not what I want to talk about this month. However horrible an individual gig might be, if you love what you do, there's always another gig right around the corner that makes up for it—the incredible vocal track, the perfect drum sound, the ridiculously complex but successful remote, the miraculous edit, the mix that jumps out at you and screams, "This is Platinum, baby!" But when you're in the wrong job, when you've

made a really miserable career choice, the Gigs From Hell don't go away—you just get a new one every day. You begin to appreciate what Dante meant when he said "Abandon all hope, ye who enter here." And that's what I want to talk about: the two worst, most onerous, utterly dead-end jobs I ever had.

When I first got out of college with a degree in orchestral performance and a hankering to produce records, there were no clear career paths open. I interviewed at all the major classical labels and was told that staff producer jobs only become available when someone died—and the only slot that had opened up in the last ten years had been filled by someone just like me, just the year before. (He's still there, too.) I went around to most of the major studios in my neck of

BY PAUL D. LEHRMAN



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World Radio History

the woods and was told they'd be happy to take me on, as long as I agreed to be a gofer at no pay, emptying wastebaskets and ashtrays, and procuring sandwiches and drugs for the clients, with the hope that if I hung around long enough, I might someday be allowed to touch a button on a tape deck.

A friend of mine who had finished college the year before was working for one of the larger music stores and was constantly telling me how much fun it was (I think he's now in the clothing business). So I asked him to put in a good word for me, and I got a job there, too. It was long hours, at minimum wage, and I was on my feet all day, but at least I could tell myself I was working in my chosen field.

I was hired as a "front counter" guy. That meant I handled things like guitar strings, clarinet reeds, sheet music, harmonicas and the occasional student trumpet or saxophone. The folks at the "back counter" were selling guitars, amps, drums and organs. They got to demonstrate all that cool stuff (and if I never hear the intro to "Stairway to

Heaven" or the instrumental break from Stevie Wonder's "Living for the City" again, it will be too soon), hang out with the occasional famous rock musician (Mick Fleetwood came in once to buy sticks), and not incidentally make a lot more money, because much of the

**Once a week
I engineered a remote
from a restaurant
with the world's largest
salad bar—the DJ and I
got to pig out
after the show was over.**

merchandise carried "spiffs": \$10 or \$20 bonuses to the salesperson who closed the deal.

I asked to be transferred back there, but I got caught in a Catch-22: Because I was musically literate, I was "too valuable" up front. And so I stuck it out

with the piano teachers and the kids in the junior high bands and became more and more frustrated.

One day the assistant manager announced that we could get a spiff on something too: A student oboe had been gathering dust in the back room for years, and he wanted to get rid of it. He put a sign up advertising it at a bargain price and offered \$20 to the salesman who managed to pawn it off on somebody. It wasn't going to be an easy sale: For one thing, it was made of plastic; for another, it was missing the two lowest keys because the manufacturer figured no beginning oboist would ever need to play those notes, and so they could save on the cost of the metal. I was a bassoon player, which wasn't *too* different, so one weekend I took the instrument home, along with a plastic reed and a method book, and learned how to play a couple of tunes on it.

Lo and behold, about a week later a woman came in saying that her precocious 12-year-old son had just started to play the oboe, and rather than use the horrible one the school had, she wanted to buy him a "really nice" instrument. The other salespeople, knowing

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of my intensive preparation for this moment, called me over, and I proudly whipped out the plastic monstrosity and played the opening bars of Ravel's *Bolero*. Even after my brilliant demonstration, however, it was a hard sell convincing her this was an instrument that would "serve the boy well for years"—because, of course, it wasn't. It took two more visits (why she never brought the kid's teacher, I'll never know; no doubt he would have laughed himself silly over the thing), but finally she succumbed and wrote out the check. When she left, the whole store came over and congratulated me—I was a front counter hero, and my future in the business was assured. That night, after closing, I waved a cheery goodbye to everyone, walked out to the parking lot and threw up.

One other incident in my short tenure as a music-store salesman stands out. We often stocked two types of accessories: brand-names and non-branded. The non-branded ones were referred to behind the counter as "GPS." Thus we had Fender guitar picks and GPS picks; Selmer reed cases and GPS reed cases; Passantino music paper and GPS music paper. I didn't know what

GPS stood for, but everybody said it, so I figured it was the name of a wholesaler who supplied the store, or had some other official meaning.

One day a customer came in and asked for a guitar capo. I asked him if he wanted a brand name, and he said no, the cheapest one we had would be fine. The drawer in the counter where the non-branded capos lived was empty, so I got on the house P.A., which was our way of communicating with the stock room, and announced: "Stock, send me up a box of GPS acoustic capos, please!"

From out of nowhere the manager of the store (the wife of the president of the company and a force to be reckoned with) stormed up to the counter and barked in my face, "Come with me!" She marched me away from the bewildered customer into her tiny office in the basement and slammed the door. "Don't *ever* say that on the P.A., and don't *ever* say that in front of a customer!" she screamed. "I never want to hear that again!"

I apologized weakly, assuring her it would never, ever happen again and dazedly climbed back upstairs wondering what horrible thing I had done. It

took a few hours, but finally the rest of the front-counter staff were able to stop giggling long enough to explain that "GPS" was an "unofficial" acronym, frowned upon by management, and not something to be said over the P.A. system. What it stood for was "Generic Piece of Shit."

My illustrious career in counter sales was followed by a somewhat longer stint in radio. I was interested in doing production work, and maybe even becoming an on-air voice, but at the time the only jobs I could find were in engineering. I toiled miserably for a while at a classical FM station in one city, and then, to my great surprise, was hired as chief engineer for a similar station in another city. When I arrived there, however, I discovered they had brought me in over their assistant engineer, a slovenly-looking, Grateful Dead-loving, opera-hating, pot-dealing, 21-year-old college dropout whom they didn't want to give the chief's job to because they needed someone who projected a better "image." Trouble was, he was a far better engineer than I and was far more knowledgeable about the station's equipment (some of which was pretty

—CONTINUED ON PAGE 218

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kind of "tube" sound, the new 2-channel D19 MicVALVE provides every possible variation—including switching the tubes out altogether for superb direct-to-digital recording.

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World Radio History

MARCH 1997, MIX 23

Jacks Below

And Other Truths About 8-Bus Recording Consoles



Get Back Jack. Get Real.

Have you ever seen a pro-studio recording engineer mess with the cables on a console? Of course not. That's why true recording consoles have their jacks in back. Look at any console in any serious studio. Truth is, once the console is installed there's no need to change the setup. Like the TASCAM M2600MKII — the next-generation 8-bus. Available in 16, 24 and 32 input models, it looks clean, sounds sweet and works the way you want it to.

All Your AUXes. All The Time.

With 6 AUXes (2 are stereo), the TASCAM M2600MKII has more AUXes than any other console in its class. But the best part is — you can use all six — all the time. No other console in its price range can make that claim. That means you can use more effects, set up multiple independent stereo headphone mixes and have more flexibility. No limitations. And no repatching.

Get Out! Direct or With The Group.

A true sign of a recording console is direct/group switching. That's what makes recording with the TASCAM M2600MKII so smooth. Think about it. Send any signal direct to tape or disk by pressing one button. Or, send a group of signals direct to tape or disk just as easily — no patching here! You'll never have to crawl around or mess with your cables again. Spend more time recording and less time figuring out how.

The Features Demanded by Pros.

The M2600MKII has everything a great recording console should have — and more. It's an In Line configuration with flip switches. And you get your choice of balanced (+4dBm) and unbalanced tape ins and outs. Phantom power (48V) switchable in banks of 8 channels. And an optional multi-process meter bridge so you can keep your eyes on the board — and not your recorder. Plus, a semi-parametric split EQ on every channel and it's ready for automation using any of a number of third party packages.

Watch it. Do Those Switches and Knobs Wiggle?

Before you buy an 8-bus console check out the quality. Knobs and switches that wiggle are going to be a problem. For example, check out the controls and faders of the M2600MKII. No play, no wiggling. You can feel the quality. Feel those smooth long throw 100mm faders. Clean. And check out the ergonomics. Even the largest fingers will fit between the knobs. Try that on others!

Use A Solid Heavyweight.

TASCAM has built more recording consoles than any other manufacturer in the world. We know how to build a quality product that will last. The M2600MKII is a solid console. You can feel the difference just trying to lift it. Just compare it to the less serious lightweights on the market. Plus it comes with an extra heavy external power supply that delivers more headroom than anything else in its class. Just what you expect from the leader in multitrack recording.

Get Smart. SmartSwitches™

The difference is in the design. This is a serious console. Take a look and you'll notice the design touches that distinguish the M2600MKII as the next-generation 8-bus console. Like TASCAM's exclusive self canceling and two-tone SmartSwitches — for protection from redundant operations and visual confirmation of all button positions at a glance. Quite a hassle on others!



Great Sound. The Next-Generation 8-Bus.

The real truth about a recording console is sound. With Absolute Sound Transparency™, high-end mic pre-amps, ultra low-noise circuitry, and high-output op amps, the M2600MKII is amazingly quiet, absolutely transparent and perhaps the best sounding console under \$20,000. And starting at only \$3,199, it's truly the sound decision for a next-generation 8-bus recording console. Put it on your shopping list today.



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Double Reinforced Dual-Ground System

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ing In Back.



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(SEE READER SERVICE CARD FOR MORE INFO)

MISPERCEIVED MARKET?

"I think there's been a misperception about how good the market is down here for music recording in the last few years," says Kevin Dillon, studio manager at Crescent Moon Recording in Miami. "It's not really booming in the way that lot of people in the industry think it is. We stay busy, but this is not New York or Los Angeles. We're dependent upon people who come here to work, not on the ones who live here. It's still a tourist business when it comes to studios."

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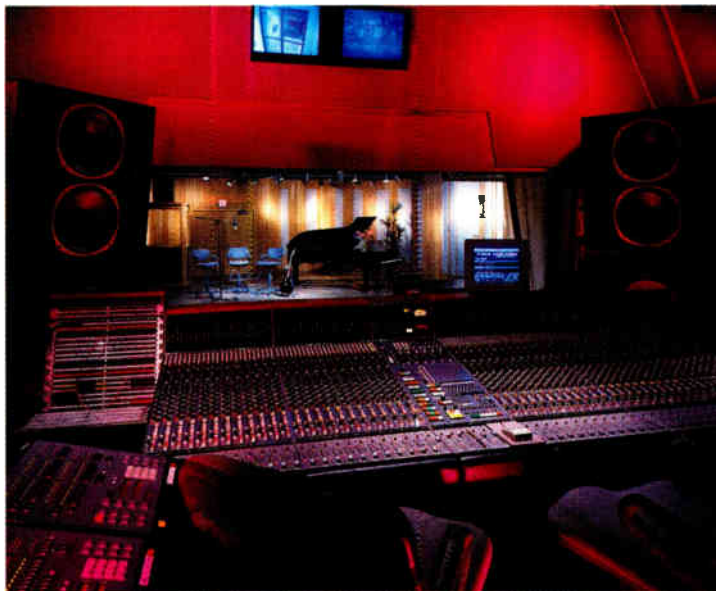
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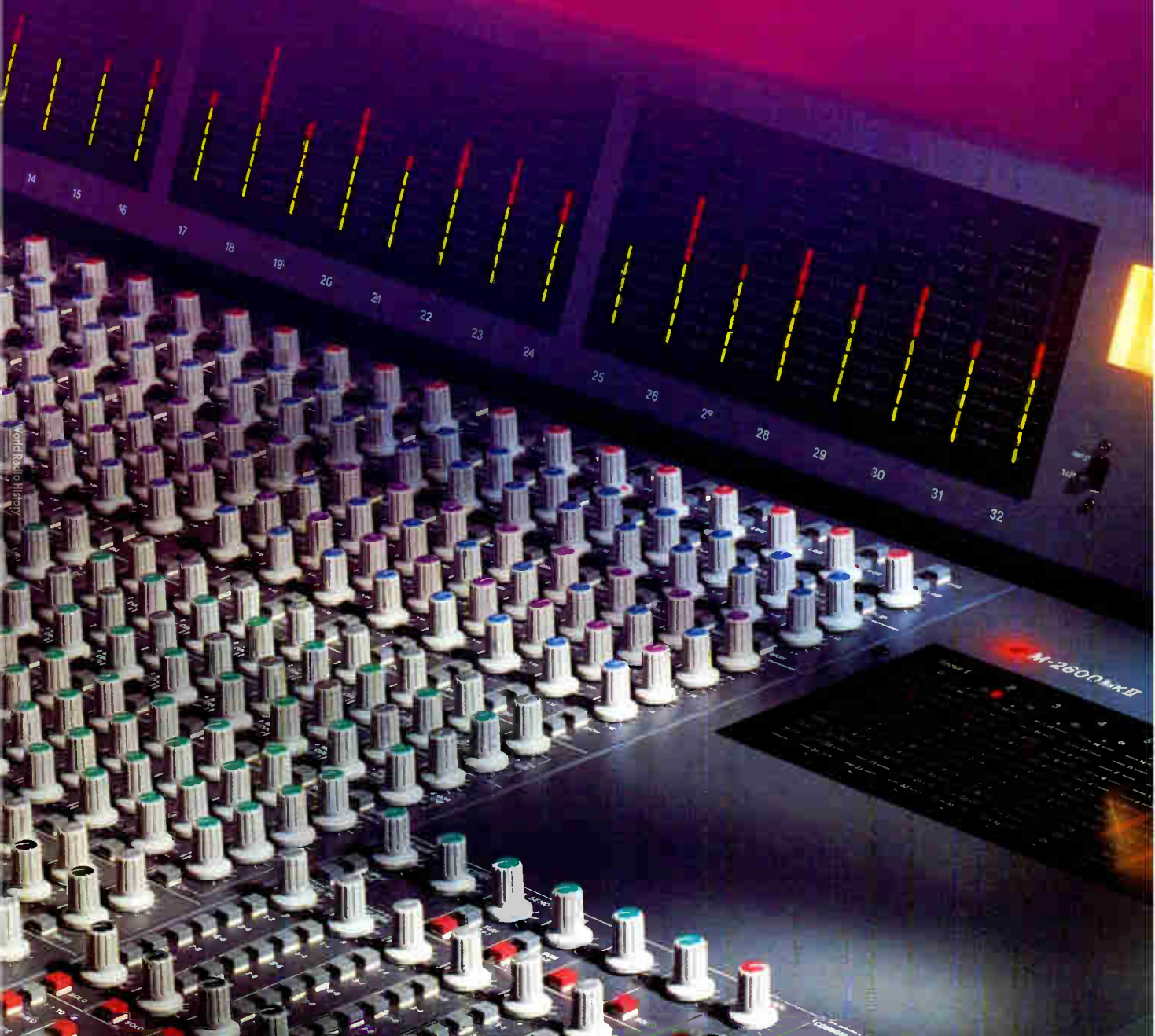


The Bee Gees' Middle Ear

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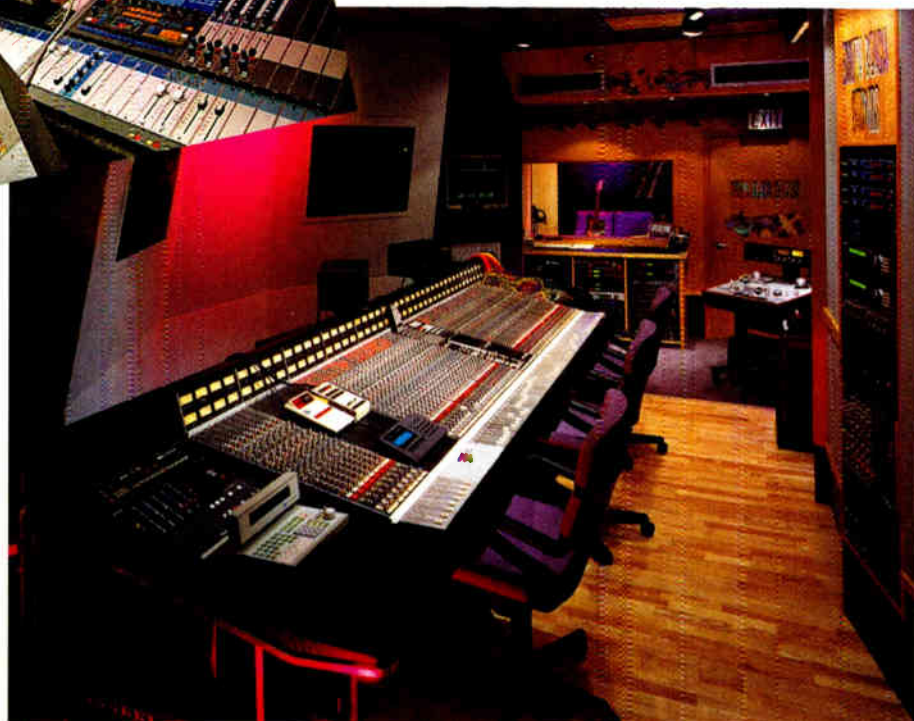
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(SEE READER SERVICE CARD FOR MORE INFO)

Miami



Above: New River Studios, Fort Lauderdale. Right: South Beach Studios.



Fluctuating business has been an inescapable part of studio ownership in U.S. markets for years. But in Miami, business—like much else—is different. Miami seems to have struck a balance between the amount of work it gets and the number of studios that can do that work, a scenario any studio community would envy. All of the major facilities in the Miami area report full dance cards. Rates have neither declined nor increased, and studios have begun broadening their array of services in search of new revenue streams for the future.

IN THE Middle

BY DAN DALEY

The Gold Coast Strikes A Rare Balance



Above: Studio A at Crescent Moon Studios features an SSL 8080 G with Ultimatum and Total Recall. **Below:** In Studio B at Criteria Recording (front to back): chief tech Clyde Hagler, president Joel Levy, studio manager Trevor Fletcher. At left is maintenance engineer Kurt Berge.



If all that sounds good, it is. At least for now. However, the fact is that this fortunate turn of events is not in any way calculated or the product of any concerted effort; there are no favorable omens for the rest of the country or even for Miami's own future. Furthermore, a balance between the size of the market and resources of the studio community is by nature temporary. Project studios exist in Florida, as they do everywhere else. As the lower strata of the music industry continues to expand and fragment, a well-developed project studio environment is already prepared to absorb a lot of the alternative music recording. Dance remixer and producer Jellybean Benitez reportedly has opened an office in the South Beach neighborhood. Can a personal studio be far behind?

Another factor that limits business fantasies about Miami is that many of the region's largest studios are not fully subject to the imperatives of a free market: South Beach Recording is partially owned by Island Records owner Chris Blackwell, Middle Ear is first and foremost a facility for its owners (the Bee Gees), and Crescent Moon Studios serves that same purpose for Gloria Estefan and her producer/husband Emilio. So, when internal sources of revenue are accounted for, the picture is perhaps better than the one found in New York or L.A. on average over the past five years. Nevertheless, when Miami studios are subjected to the same hard-to-predict market forces as exist in those cities, they share the same problems.

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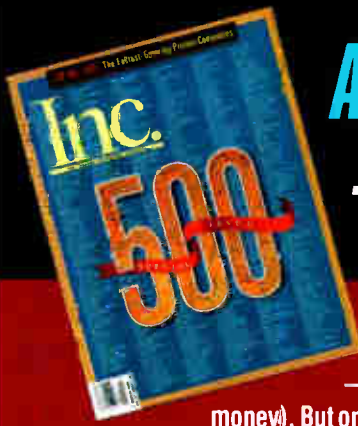
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The Bee Gees' *Middle Ear*

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MULTICHANNEL MUSIC MIXING

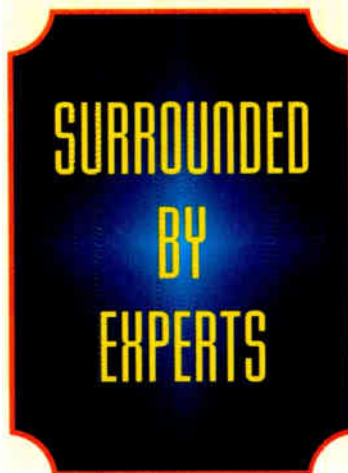
One constant theme in the history of recorded music has been the regular appearance of improved media. Vinyl singles and LPs replaced brittle and noisy 78s; 8-track cartridges enabled consumers to play recorded music in their cars; cassettes provided a portable and robust alternative for people who had trouble keeping LPs in playable condition; and CDs promised “perfect digital sound.”

But with one exception—“quad”—the introduction of new release formats has had little impact on the work of mixing and mastering engineers. Since the late '60s, artists, record producers and record companies have generally required only one finished stereo master; in theory, at least, all production masters were then derived directly from the authorized version. But the appearance of various 4-channel playback formats in the early '70s promised a brand-new audio landscape. Record companies began scouring their tape vaults for material suitable for remixing for the burgeoning Quadrophonic market, and hi-fi manufacturers geared up in anticipation of pro-

jected quad system sales figures. However, the new format failed in the marketplace, and the mainstream record industry has been extremely wary of multichannel music formats ever since.

Despite the disastrous quad experience, multichannel music reproduction has retained a loyal following, chiefly among classical music audiophiles who seek to reproduce the acoustic sensation of a concert hall. And the rapid and continuing growth of the home theater market has created a sizable installed base of surround-ready listening environments. Today, several record companies are actively exploring the market for multichannel music mixes, and some are reporting unanticipated success. It seems reasonable to predict that, whatever share of the market is finally captured by multichannel releases, mixing and mastering engineers will soon see increased demand for multichannel facilities and services.

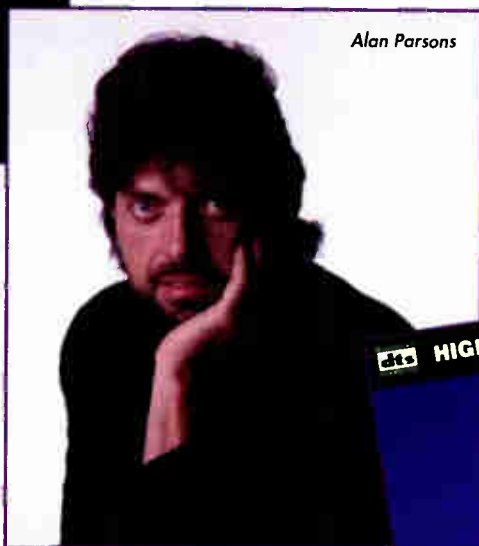
The technical requirements for a multichannel mixing environment are in flux—a standard will only solidify when one (or more) of the several delivery formats is adopted industry-wide. At present, the *de facto* standard for home theater is Dolby Pro Logic™, the 4-channel matrix format first developed for theatrical film releases and later adapted for video and laserdisc. Dolby Pro Logic™ (aka Dolby Surround) provides Left, Center, Right and Surround channel information from an encoded 2-channel source and, most important, is compatible with stereo. Perhaps of more significance is the widely quoted sales figure—25 million—for consumer units carrying the Dolby Pro Logic or Dolby Surround logo.



BY CHRIS MICHIE



Left: John Eargle, director of recording for Delos International.



Alan Parsons

as matrix-encoded material can be played back (in stereo) in any standard CD player.

Whether the final technical setup for creating multichannel audio material is 4-channel, 5-channel, 5.1 or even 7.1 (Sony Dynamic Digital Sound film format), actually mixing the music is likely to be similar in operational terms. To get some perspective on the practical aspects of multichannel music mixing, *Mix* spoke with artist/engineer Teja Bell, Telarc engineer Mike Bishop, engineer/author John Eargle, president of DMP and producer Tom Jung, producer Robert Margouleff and engineer Brant Biles of Margouleff Biles and Associates, and artist/producer Alan Parsons.

But Dolby does not have a monopoly on the market for multichannel encoders. RSP Technologies offers Circle Surround, a stereo-compatible matrix system that offers separate left and right rears, for a total of five playback channels. And relative newcomer DTS Technology has introduced DTS Digital Surround, a 5.1-channel system that, while offering completely discrete signal sources and higher resolution than matrix systems, raises a significant compatibility issue; DTS absolutely requires a playback decoder, where-

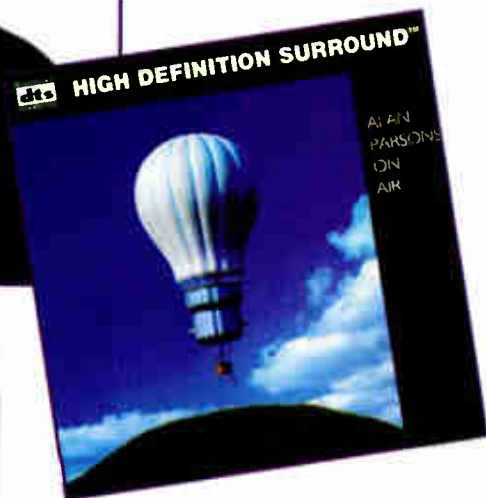


PHOTO: MARCELO COELHO

DRIVEN TO TEARS

Since May 1996, Robert Margouleff and Brant Biles have been almost continuously involved in remixing new and existing material in a 5.1 format for DTS, which is developing a pop, jazz and classical catalog to support the sale of DTS decoders. Working primarily at The Enterprise (Burbank,

At left: The DTS team listening to 5.1 playback at The Enterprise's Neve Capricorn. Clockwise from top left: DTS president Bill Neighbors, DTS marketing director David DelGrosso, engineer Brant Biles, producer Robert Margouleff.

There's a lot more to contend with inside a dynamic moving field, and it's essential to be able to control all the elements.
—Brant Biles

Calif.), Margouleff and Biles have remixed tracks by Seal and Boyz II Men for a DTS demo disc, have mastered the latest studio recording by Alan Parsons and, with producer Brad Miller of HDS and the active encouragement of Decca's John Pellowe, remixed a "Pavarotti and Friends" live album in 5.1. The team recently completed mixing an album's worth of Marvin Gaye's classic Tamla Motown material in 5.1.

As Biles explains, the team has been monitoring 5.1 mixes through five Genelec 1032s supplemented by a pair of M&K subwoofers positioned at the front of the mix room, under the right and left speakers. "With periodic music like pop music that has a kick drum, I think that you want to feel where that waveform is coming from," explains Margouleff. For mixing and routing, they have been using The Enterprise's Neve Capricorn in its 5.1 film matrix mode, which offers front to back panning, as well as two modes of left/center/right panning. A "full convergence" pan spreads the signal among the three speakers, whereas a simpler LCR pan splits the signal only between adjacent speakers.

According to Biles, the Capricorn's automation eased the necessary compensation for varying proximity effect on vocal tracks as singers moved in front of the mic. "It's important because there's a lot of stuff going on in 6-channel," he says. "There's a lot more management than in stereo, where you have an objective mix in front of you. In surround, you're immersed in it and it surrounds you. There's a lot of musical motion, so there's a lot more to contend with inside a dynamic moving field, and it's essential to be able to control all the elements, including EQ, switching, gating, limiting—everything. [Automation] gives you the opportunity to have total control over it."

Margouleff and Biles made extensive use of The Enterprise's multiformat transfer facilities for the Marvin Gaye

project. They first transferred the masters to a Studer 48-track digital machine at 18-bit resolution. Then they used the Sonic Solutions NoNoise process to clean up some of the noisier tracks, particularly lead vocals. For playback, they used a Sony 3348 and routed the digital output of the Capricorn on three AES pairs to a Prism interface that encoded the 6-track, 20-bit mix for storage in the Tascam DA-88 format.

For outboard effects, the pair relied on three Lexicon PCM 80s, TC 5000s, an Eventide DSP 4000 and an EMT 250, which, as Biles notes, was originally designed for quad and furnishes four outputs. The pair also made use of a Bedini Audio Spacial Environment (BASE), an older device made by a company known chiefly for its hand-wired amplifiers. Outboard limiters included models by Summit and Manley.

Margouleff and Biles are understandably enthusiastic about the new format and entertain bright hopes for its future. "DTS makes a pure, beautiful format for music," says Margouleff, who claims that the emotional impact of being immersed in the musical sound field can be profound. "Both Brant and I, on several occasions, have had to step out of the room on being brought to tears," he says.

VETERAN OF THE QUAD WARS

Alan Parsons' first experience with multichannel music mixing dates back to 1973, when, at the request of the record company, he prepared a quadrasonic remix of Pink Floyd's *Dark Side of the Moon*. Parsons recalls that the original requirement was for a discrete 4-channel mix, and also for SQ and QS versions, competing stereo-compatible matrix quad formats. Faced with the prospect of having to create three additional album-length mixes, Parsons looked for a shortcut.

"In the end, what I decided to do was make a slight compromise and make the discrete, SQ, and QS versions

compatible, so that I was only really zeroing in on one mix," he says. "I concentrated on the discrete mix and made sure that was as I wanted it, and then if there were problems in SQ or QS, I would make slight changes. Usually, the only reason for problems in SQ and QS was if you put stuff in the center of the room or at the center-back of the room. If you were panning around, you tried to go past center-back very quickly because of the out-of-phase signal at center-back."

Twenty-three years later, Parsons returned to the multichannel format to mix his most recent album, *On Air*, for release in DTS on the HDS label. Again, rather than create a multichannel mix from scratch, Parsons worked out a scheme to leverage the work he was already committed to for the stereo mix.

"I did the surround mixes at the same time as the stereo mixes for the album," Parsons explains. "I first set up in surround and got all my panning and effects sorted out in surround. Then I switched to stereo and did all the nitty-gritty of the mix and concentrated on that. Once I had established that I had the mix I wanted for stereo, I then went back to check it in surround. In about 60 percent of the mixes, I was happy—occasionally, I had to tweak something because it was too front-heavy or back-heavy."

Parsons' setup for the mix was not elaborate. He used his own ten-year-old Amek Angela console to mix to four output buses, and monitored on two pairs of Genelec near-fields. Though the board's automation took care of levels and cues, Parsons created panning effects manually. "I managed to get away without joysticks completely," he says, explaining that for the single "panning around the room" effect on the record, he simply panned between pairs of buses. "I simply did the panning on the panpot, stopped when I got to a corner, repatched, punched in, and did the next bit." Parsons also drew on his earlier experiences with quad to make up for the limitations of current effects devices, which are generally designed for stereo. "I have an old Quantec Room Simulator from the early '80s, which has four outputs," he says.

Though he had no monitors set up for either a center-front channel or the sub-bass channel, Parsons found no difficulty mixing for the 5.1 format within what he calls a "4.0" setup. "There was only one small thing I knew I wanted to put on the center channel,"

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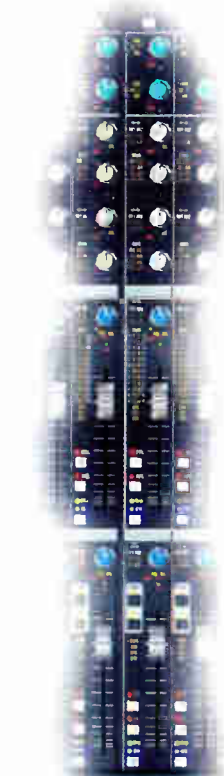
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A final note:

Euphonix is pleased to announce that the CS2000F was awarded the 1996 TEC Award in the Large Format Mixing Console category.



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**I'm not averse to going in after
the fact and encoding something for
the back, without
compromising for stereo.**

—John Eargle

he says. "I just put it on a track—I wasn't actually able to monitor it—and left it to the mastering stage. When I went to Los Angeles to master and checked it out there, it was fine. The sub-bass was all derived from the four channels; it was never mixed separately as a discrete sub channel.

"It was very pleasant to listen to and going back to stereo was quite an anticlimax," he says, expressing his enthusiasm about the 5.1 format while maintaining cautious optimism about its future success in the marketplace. "With quadraphonic dying a horrible death as it did, I think everyone was hesitant to ever think about [multichannel] again."

he says, voicing a common opinion. "Dolby Pro Logic has to be thanked for popularizing multichannel in home theaters," he says, though he believes that the format hasn't yet had as great an impact in Europe as in the U.S.

NO SACRIFICE OF STEREO INTEGRITY

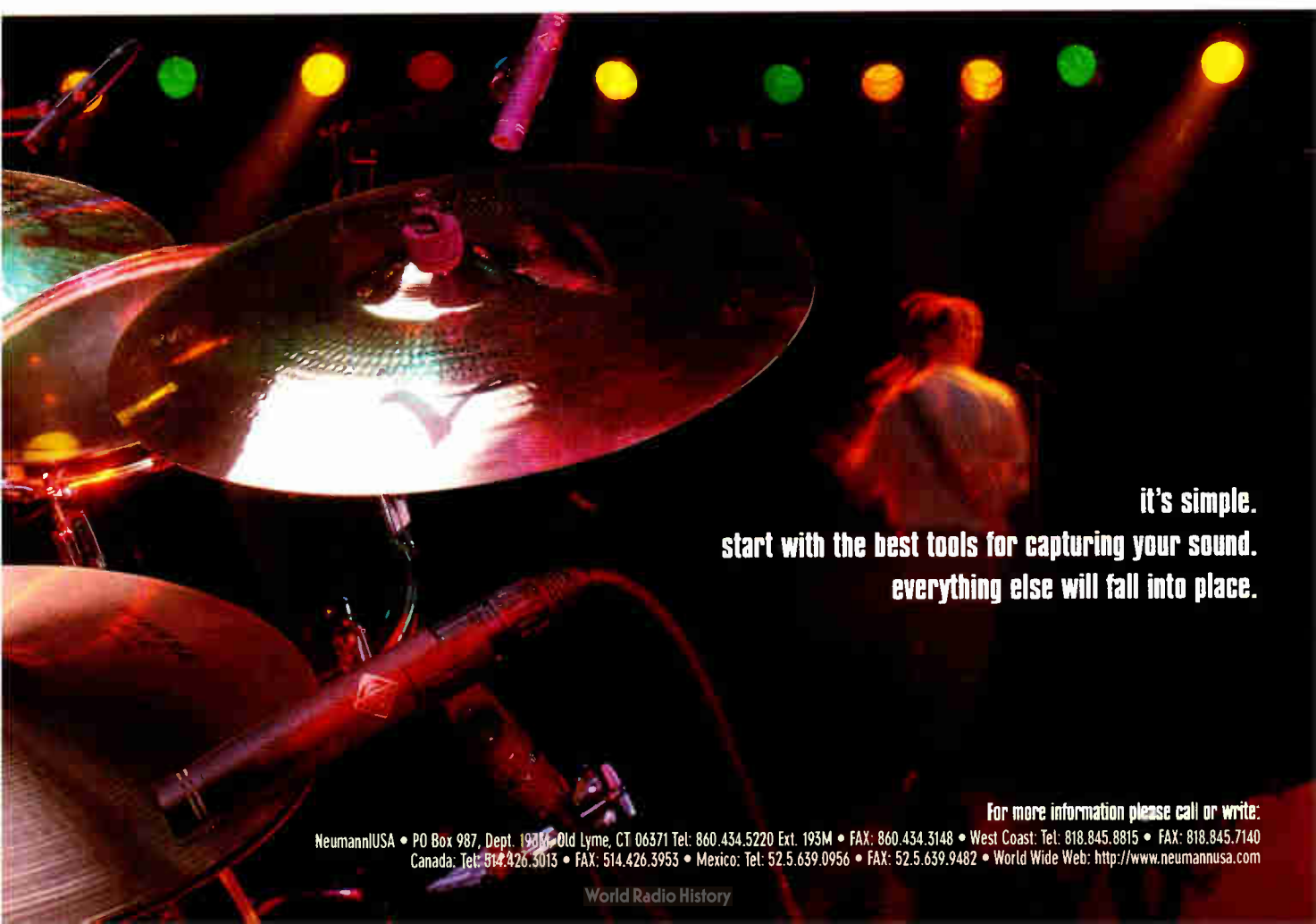
John Eargle is known and respected for many achievements. He was involved for 20 years in product development at JBL and has written extensively on audio, including sections on quad recording in his book *Sound Recording* (Litten Educational Publishing, 1980). He has recorded more than 200 CDs

(including the recent Grammy-nominated recording of Tchaikovsky's *1812 Overture*) and is director of recording for Delos International.

The Delos catalog leans heavily toward orchestral music, though it also includes choral works and opera, chamber music, solo instrumentalists, jazz and spoken-word recordings. Whenever practical, says Eargle, Delos projects are mixed direct to 2-track for stereo release; those projects deemed suitable for multichannel treatment are later remixed for Dolby Surround. Delos has no current plans to release material in a 5.1 format, though it has not been ruled out.

Typically, Eargle records the stereo mix to a DA-88, with a selected three pairs of mics also recorded separately on the remaining six tracks. Editing of all eight tracks is done on a Sonic Solutions workstation; when the stereo edit is finished, the EDL is automatically applied to the three other pairs, and the 8-track master is ready for a surround sound mixdown.

"I always use a center pair of microphones, an ORTF pair," says Eargle, describing a typical recording setup. "When we make a surround sound



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mix. I take the two mics which are normally panned left and right, and I subtract them partially from what's going to front-left and front-right, then I pan them together and put them in the center. So I end up with panned images from those mics that are slightly left of center and slightly right of center—you create a good, firm center image when you do that."

Eargle points out that within certain compositions—Berlioz's "Requiem" and "Belshazzar's Feast" by William Walton, for example—there are musical effects that lend themselves to manipulation within the surround field. "I'm not averse to going in after the fact and encoding something for the back, without compromising for stereo," he says, adding, "I would never want to sacrifice stereo integrity for Dolby Pro Logic matrix grandeur. I think that the two can coexist."

Though Eargle's approach to mic placement and balance is rigorous, he is also a pragmatist: Delos has released CDs marked with the Dolby Surround logo that were never actually mixed for surround. "If playing stereo information back through a Pro Logic setup enhances it, then it's worth it," explains

There's so much room for experimentation, it sort of boggles the mind.
—Michael Bishop

Eargle, who spent many hours listening to both regular stereo and encoded material through the Dolby Pro Logic decoder before Delos started using the Dolby logo. "I figured out an aesthetic zone in which this whole thing works," he says, adding that "some of the [matrix] systems sound absolutely gorgeous. Let's say we wanted to go to a 7-channel presentation. I can come up with a demixing and remixing strategy that would handle all of that. Once you're into this post-production domain, you shouldn't deny yourself anything if you think it's going to help create a picture."

On a practical level, Eargle has relatively undemanding technical requirements. He points out that almost any console that provides direct outs from the mic pre's can be used to record and

archive the typical classical recording session. "You make do with current consoles because that's all you have," he says. "There are very few that are really dedicated to ultimate flexibility in a surround-sound format."

EVERYTHING CHANGES

Tom Jung is president of the DMP record label and has been the engineer/producer for all of its releases. Primarily a jazz label, DMP offers seven titles in the Circle Surround matrix format and two in the discrete DTS format. As Jung describes it, mixing for the two systems is completely different. "I use the same monitoring system," he says, "but everything else changes." He notes that, with a matrix system, "a lot of decisions have been made for you as to what goes where. You can still do



frontal panning and that sort of thing, but in terms of what gets added to the surround, you have control of that only to a certain level—out-of-phase material in the front stereo pair will go to the surround. You have to understand how matrix surround works if you want to use it.” By contrast, says Jung, “With a discrete system, you have the ultimate decision on what you can put in each channel. Nothing goes any place without you putting it there.” However, he concedes that this may be easier said than done, since 5.1 requires flexible busing capabilities in the mixing console and “a lot of the tools I wish we had but that we really

don't have yet.”

Jung's monitor system is made up of five Westlake Lc8.1 monitors on stands, powered by Hafler 9505 Trans Nova amps. Overall monitor level is controlled through a custom 6-channel control. Jung has been using the Yamaha 02R as a mixing console and is anticipating that new software will allow more flexible panning. “The nice thing about a digital console is that all of the panning can be addressed in software,” says Jung, who also notes that the RSP Technologies' Project X console has Circle Surround encoding built in.

For reverberation, Jung has been

using multiple Sony D77s, which interface with the 02R at 24-bit, but he finds that patching the multiple reverb returns can be complicated. “I put a lot of equipment through hoops...just to try to get the results I want,” he says.

RECORDING LIVE IN 5.1

Telarc International's engineer Michael Bishop was recently involved in two very different multichannel music projects: a record of movie soundtrack music with the Cincinnati Pops Orchestra, and Junior Wells' *Come on in This House*, primarily acoustic blues. Both releases will be available on Telarc in standard stereo and the DTS 5.1 format.

For the Junior Wells recording at Dockside Studios (Maurice, La.), Bishop actually ran both stereo and 5.1 mixes at the mix session. “I recorded the session with 5.1 in mind since I had just returned from the May Hi-Fi '96 show at the Waldorf, where I did some demos for DTS,” he says. “I was charged up about [5.1] and was very happy to do something in the format.”

At the session, Bishop set up to record multiple separate ambience tracks and also worked with the musicians to create 4- and 5-channel recordings of the acoustic guitar, acoustic bass, drums, piano, vocal and harmonica instrumentation. “I could put the listener right there in the middle of the studio in front of the performer and [they would] be able to experience the whole performance as if they were sitting in front of them,” he says.

Bishop usually prefers to record straight to 2-track, but in this case recorded analog to a Studer 827 with Dolby SR. The record was mixed through Dockside's “very highly refurbished” 48-channel Neve 8068, and Bishop mastered the 5.1 mix to a DA-88 through a Prism interface at 20-bit resolution. “I was using some custom A/D converters built for Telarc as the front end,” he adds. “I keep everything at 20-bit, at least in the digital domain.” Monitors were all Genelec 1031s.

For effects, Bishop made use of a Lexicon 480 and a Lexicon 224, distributing returns between front and rear. “The 480 has two sets of stereo outputs, so I was able to take the front outputs and route them to the front channels and the aux outs to the rear,” he explains. “The 224 I used for some interior effects that were common between front and rear.” Bishop also used the Desper Spatializer, which of-

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fers four discrete output channels and eight joysticks, for multichannel positioning and panning.

"For the Junior Wells mix, I used two Spatializers and even did some 3-D processing within the 5.1 mix in order to take things out beyond the speakers," recalls Bishop. "There's so much room for experimentation it sort of boggles the mind. You can really get lost in experimenting with the placement of things and really creating quite an aural landscape. There are cuts on the Junior Wells CD where I put all of the musicians all the way around the listener. Some of it's pretty dramatic."

Another 5.1 project that Bishop has been working on is called *The Big Picture*, an upcoming CD release for which the Cincinnati Pops Orchestra recreated some of the larger orchestral pieces from recent movies, including *Twister*, *Speed*, *Executive Decision*, *Independence Day*, *Braveheart* and *Apollo 13*. For the recording, Bishop used his standard four-microphone recording setup, with spaced omnis across the front of the orchestra, supplemented by as many as 30 microphones and direct inputs for soloists and the rhythm section. Millennium Media HV3 mic preamps

were used on all mics, and all line-level signals, which included synthesizer directs and associated effects returns, were mixed direct to stereo through a Ramsa 810 console modified by John Windt.

For the stereo release, which is being put out in the RSP Circle Surround matrix surround format, Bishop added spaced omnis out in the hall, but for the 5.1 version he used a Neumann KU-100 "dummy head" stereo microphone. "I'm treating the two different surrounds differently because what I want to use in the 5.1 in the surround channel—the dummy head—won't encode properly in the matrix surround," he explains.

Bishop has also created a set of accompanying sound effects, which he recorded through 4- and 5-channel miking setups to a SADiE system synched with multiple DA-88s and later mixed through a Yamaha DMC1000. "The 5.1 music masters for the Cincinnati Pops project are on a Sonic Solutions USP system, so I'll end up running the SADiE and all of these tapes in sync with the Sonic System and mix it all down to the final 5.1," Bishop says of the planned multichannel mix session.

MONITORS METICULOUSLY BALANCED

As an artist, Teja Bell has enjoyed success with his *Dolphin Smiles* record on Global Pacific/CBS, which reached No. 3 on the *Billboard* contemporary jazz album chart. As an engineer, Bell has made 26 records since 1994, including several for the Access Music label, which is one of the many companies that releases CDs in the Dolby Surround format (there are currently 300 Dolby Surround CDs in release worldwide).

Typically, Bell records on a Fostex G16-S synched to ADAT and a Pro Tools setup for a total of 32 tracks. Bell mixes on a customized TAC Scorpion 32/8/16 and masters to analog 2-track at 30 ips using Dolby SR, though he always burns CDs as the final delivery medium. So far, Bell has only mixed in multichannel for Dolby Surround, and he also recalls that, at a client's request, he has taken already mixed stereo masters and processed them through Dolby Surround. "We've had some success with that—it's not quite as defined," he says.

Before mixing for surround, Bell meticulously ensures that the monitors

—CONTINUED ON PAGE 220



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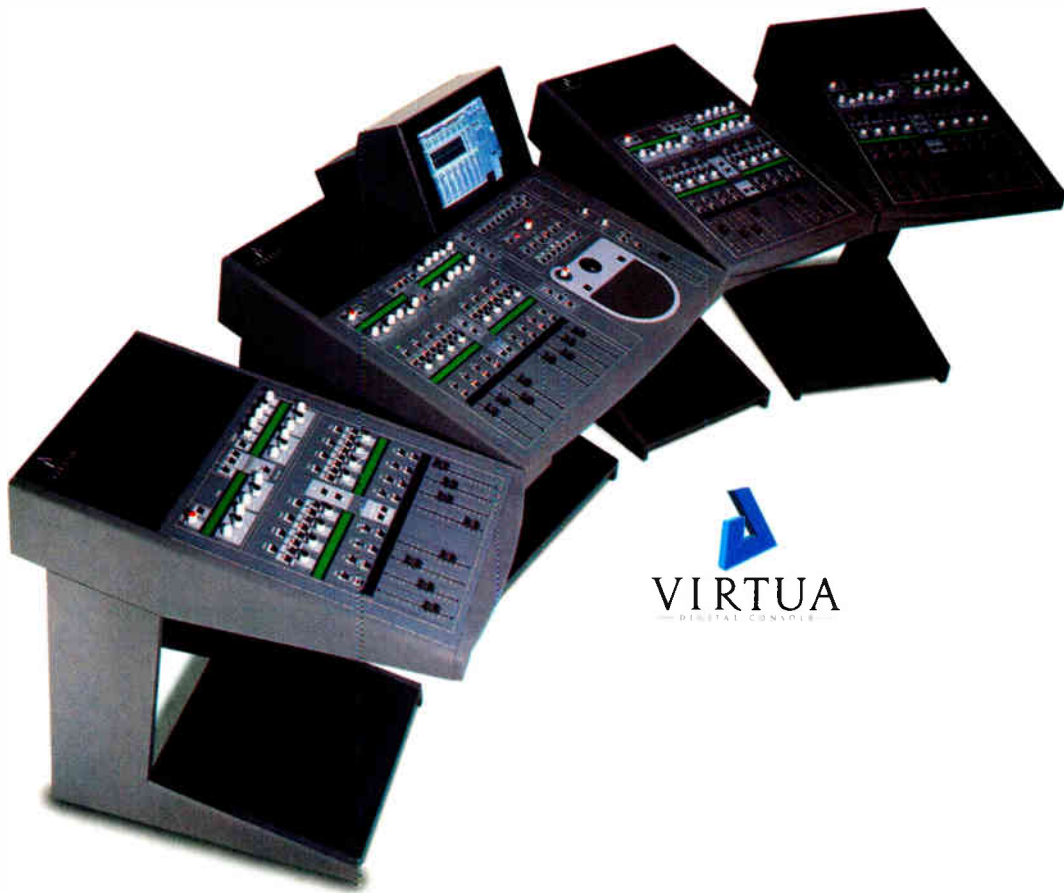
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Ocean Way NASHVILLE

RAISING THE STAKES IN MUSIC CITY

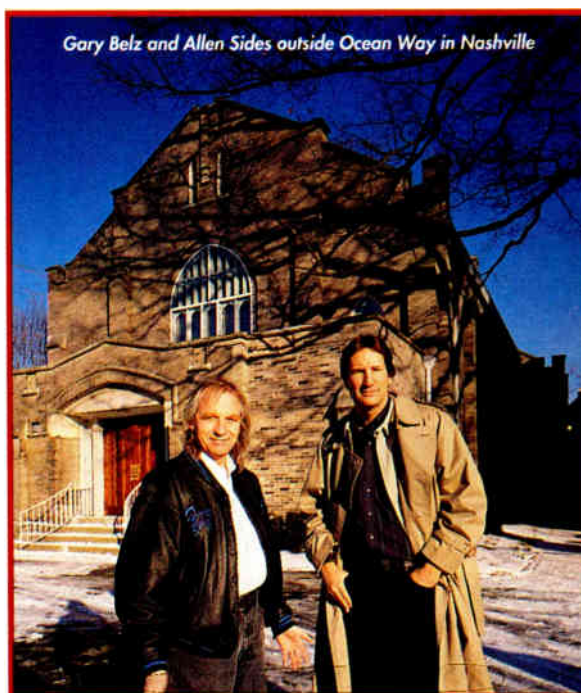
OCEAN WAY NASHVILLE MIGHT HOLD

the record for the longest major studio construction project in the U.S. Over the past three years, denizens of Music Row have passed by the former Tony Alamo church on the corner of Edgemoor and Seventeenth Avenue South and watched the infinitely slow progress. The wait is finally over.

The structure was built in 1850 and was a working church right through the late 1980s, when Alamo, a politically extreme evangelical and the building's last owner, ran afoul of the IRS. The building became embroiled in the tax action against him. (Alamo is currently serving time in a federal prison, but that has not stopped his screedish flyers from regularly turning up under windshield wipers all over town). The church was the subject of liens and litigation for several years thereafter, and it sat there unused as Nashville underwent twin booms of real estate and country music popularity.

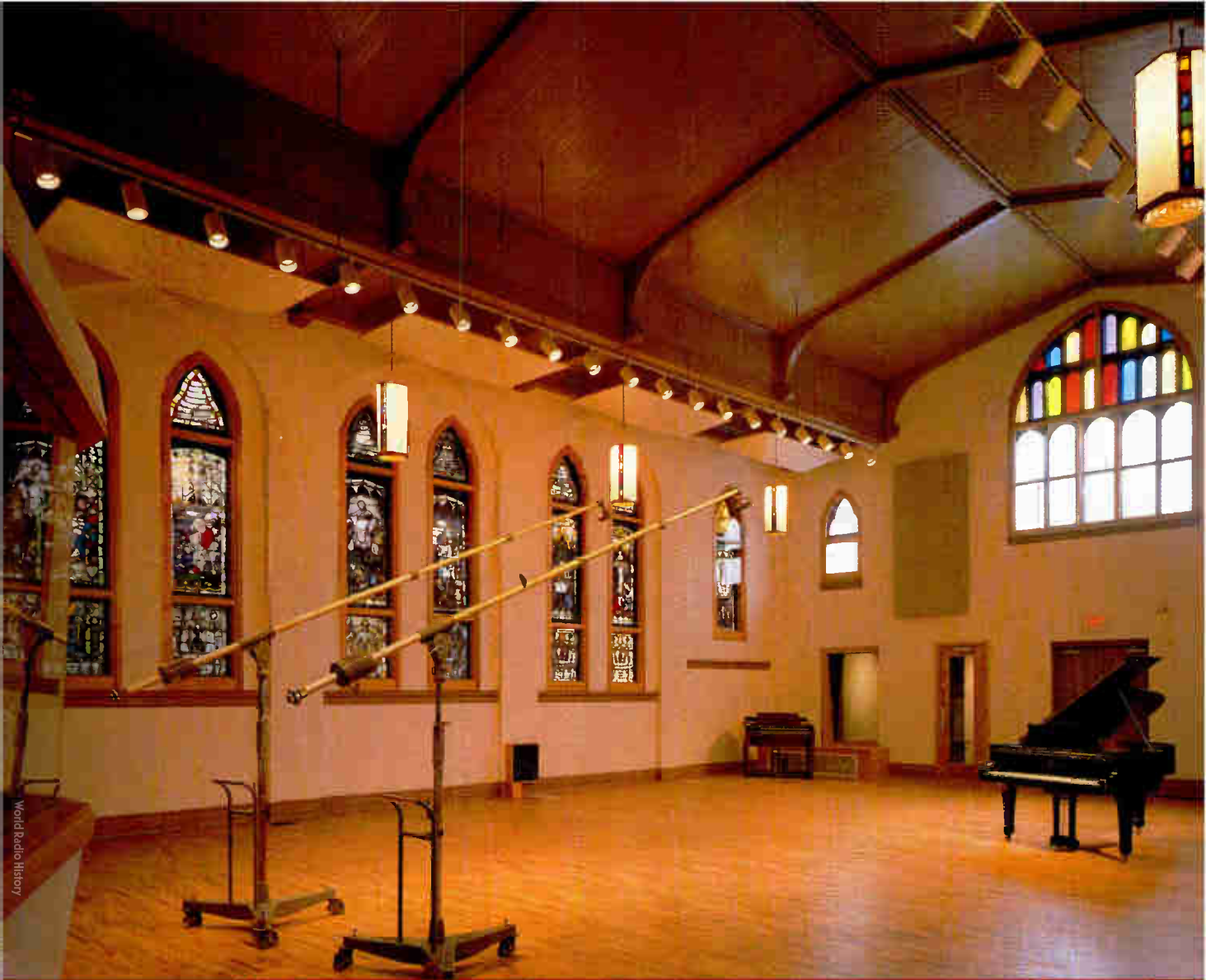
Planning for the studio took only slightly less time than the construction. Back in 1991, in Los Angeles, Ocean Way and Record One Studios owner Allen Sides had dinner with producer/engineers George Massenburg, Bill Schnee and Glyn Johns. The group discussed pooling their collective talent and experience in a series of world-class studio facilities in various global locations, possibly with partial sponsorship by a major record label. Sides began researching Nashville, and he and Bill Schnee looked at St. Barnard's, a large complex of buildings a mile from Music Row.

At that point, Gary Belz, who had become friends with Sides after he opened Kiva West in Los Angeles (now House of Blues Recording) in 1992, entered the picture. Belz, who is from Memphis where he had the original Kiva Studios (now also HOB) and who came close to opening another studio in Nashville that year, steered the search toward the Alamo church, which he had looked at during his own studio site search. "The convent site [St. Barnard's] would have been a very am-



Gary Belz and Allen Sides outside Ocean Way in Nashville

BY DAN DALEY



Above: The Neve room at Ocean Way in Nashville; right: the Sony room



bitious project," says Belz, who has built a network of studio contacts in Nashville over the years. "It would have been more of a real estate deal than a studio one. And being on Music Row just made more sense for a studio." Schnee dropped out, and Sides and Belz formed a joint venture.

"Building something like we had been talking about from scratch would have been difficult to finance," says Sides. "I remember what happened with AIR Studios—George Martin had to stop and take on a partner after he passed \$12 million. I had been driving around the year before with George [Massenburg], and we were looking at properties, and nothing really struck us until we saw the church. It was beautiful and just what I was looking for. But it was tied up in litigation." Belz's extensive background in real estate development (one of his projects was the renovation of the Peabody Hotel in Memphis) proved to be very helpful—Belz was able to take advantage of a small window of opportunity in the church's ownership and bought it for less than its



Ocean Way Nashville's API room

\$1.2-million asking price. (The purchase was actually made by Kiva-Nashville Inc., the holding corporation owned jointly by Sides and Belz for this project; financing was handled by First Union Bank of Nashville.) The process of acquiring the property took a year and included the additional purchase of a building behind the church on Sixteenth Avenue South—mainly for access to more parking. The studio now has a total of 50 parking spaces between the two properties, and the second building has been leased to Chrysalis Records.

But the real work lay inside the

church. Virtually the entire structure had to be gutted while, at the same time, Sides and Belz sought to maintain the architectural characteristics of the dowager church. Sides and Belz brought in general contractor Murray Brown, who had worked on Belz family construction projects in the past, and detail contractors Jon Meredith and Mike Cronin; they had often worked as Tom Hidley's studio contractors

(including Nashville's recently built Masterfonics) and built Belz's Memphis HOB Studios.

REGULAR LIGHTNING STRIKES

Sal Greco, who was formerly the chief technician at Paisley Park Studios and before that at New York's Electric Ladyland Studios, is now Ocean Way Nashville's chief technician. He remembers his first encounter with the studio-to-be's electrical design: "You had to do everything from ground up—new electrical wiring from pole to socket," he says. "And we needed to integrate the wiring design with the acoustical design and deal with the structural quirks

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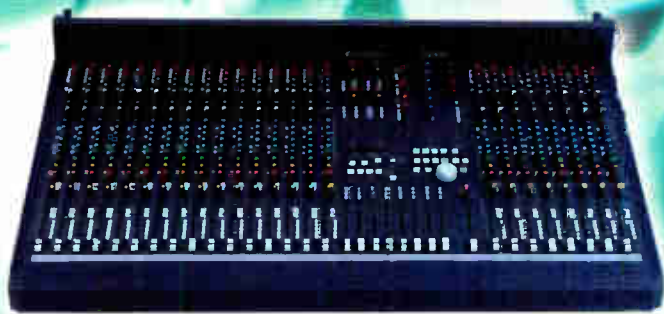
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● "The console is very user-friendly and is constructed so well that it can easily withstand the rigors of even the most hectic of production schedules."
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● "Both myself and our Production Director Jeff Thomas used the console for PowerStation and were equally very, very impressed. For the money, the console is fantastically versatile, has good headroom and a very impressive EQ." - Alex Lahey (Engineer for PowerStation)

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of the building. For instance, you're talking about 140-year-old, 2-foot-thick stone walls, and a lot of the wiring had to be run below the studios because of the need to keep the acoustical aspects of the ceilings intact." Historically, all Nashville studios have had to contend with power interruptions due to an antiquated power grid whose overhead wiring and unprotected substations attract lightning strikes on a regular basis. Greco installed a dedicated transformer as well as the studio's own ground plane; no UPS was installed (except for the one that accompanies the studio's Sony OXF-R3 Oxford digital console), but he did implement microprocessor-controlled power switching and routing for the 65kVa studio power system.

But delays—human-made and natural—plagued the construction. Sides and Belz fired the studio complex's first electrical contractor, whose original bid doubled after work began, and another contractor was searched out and hired. And both Sides and Belz were each doing their own productions and running their own studios in Los Angeles. In 1994, one of California's worst earthquakes wreaked significant damage to

Sides' Ocean Way and Record One and Belz's studio, then known as Kiva West. "That set us back," says Sides in an understatement.

THREE ROOMS, NO WAITING

If you take all the natural and human-made disasters into account, it's impressive that Ocean Way Nashville opened at all. But nobody is in the recording studio business because they are completely sane, and Sides laughingly agrees that that's the case with him. "I didn't go into this with the concept of making large profits," he says. "It was just something I always wanted to do. I anticipate making some money in Nashville, but you do something like this for other reasons."

One of those reasons is that Sides felt that both he and Belz could accomplish much more when freed from the real estate costs and other constraints of places like Los Angeles and New York. The \$5-million estimated price tag he puts on the Nashville project is, he says, a fraction of what the cost would have been in Los Angeles, where land and labor costs would have nearly doubled the budget. And, adds Sides, had he

and Belz waited longer to buy in Nashville, they would have found land prices on the Row had also increased significantly. "The price of the land when we bought it is what made a facility like this possible," he says.

New one- and two-room facilities such as The Tracking Room and Starstruck have opened in recent months, raising both the technological and economic stakes in the city's already large studio community. But Ocean Way Nashville is the first studio of its kind in the area. The facility offers three rooms, two of which are exceptionally large tracking rooms. Studio A is 50x75 feet, with 30-foot ceilings and four large iso booths illuminated by the church's refurbished stained glass windows. Studio B's tracking room is 38x25 feet, with two large iso booths. Studio C is a more intimate offline and overdub-type studio, complete with working fireplace. "The other new rooms in Nashville are very nice, but they don't have the ability to do 75-piece orchestral sessions. That's something that I want to bring to Nashville, which has a very good sym-

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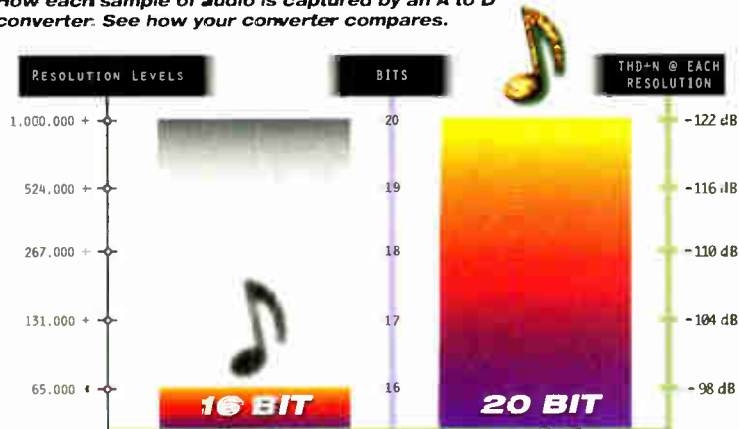
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phony orchestra," Sides says. "That's something that a lot of L.A. engineers and producers will be very interested in because it's gotten very tight for that in Los Angeles."

Studio A at Ocean Way/Nashville has a custom Neve 8078—similar to the one Sides customized for Quincy Jones several years ago—in which two vintage consoles were joined to create a 144-input, 17-foot-long hybrid board with GML automation. The board was built at Digital Dispatch, Sides' and Belz's L.A.-based rental company, which may also offer its services in Nashville. The first of the two Neves came from a studio in Japan; at one point the one at HOB in Memphis was considered a candidate until another was located in Australia.

FIRST SONY OXFORD IN NORTH AMERICA

Studio B has the first Sony OFX-R3 Oxford all-digital console to be installed in North America. (The second will go into Sides' Ocean Way in Los Angeles sometime early this year.) The three other major digital consoles available were considered, and initially a Neve

Capricorn was selected. Then an SSL 9000 was purchased. But in the end, a combination of Sides' own input into the development of the Oxford and Belz's relationship with Sony caused the Oxford to prevail. Sides says that the Oxford offers advantages such as a floating sample rate that follows VSO moves on tape, avoiding sample rate conversions and ensuing sound degradation. "We chose the Sony because we wanted something that raises the level of studio operation here," says Sides. "I think the Sony does that. And I like the way the Sony sounds."

Sal Greco was impressed by the speed of the Oxford's installation. "It went in in eight hours, which even surprised the Sony people," he says. "The only thing I was concerned about was making sure that we had a secure and jitter-free clock source, which it turns out we do." Greco installed an NVision sync system for the Oxford.

Studio C has a DeMedio-customized API console. Coincidentally, Sides contributed to the design of the API when he did consulting work at Fox's soundstage in the late 1970s. "When they shut the old stage down for renovation, I

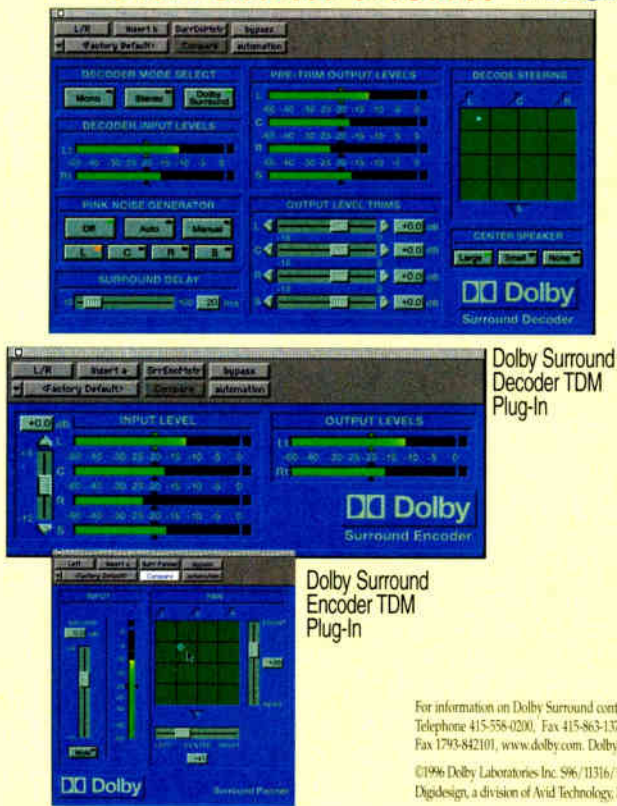
knew I wanted that console," he says.

All three studios are tie-lined together, and each also has video lines. All three studios have their own machine room. A and B have a pair each of Studer A800 MkIII analog decks and a Sony 3348 digital multitrack; Studio C has one 24-track analog. Monitoring in Studios A and B is via Sides' Ocean Way monitor systems, in this case equipped for three-way LCR mixing in anticipation of the film work Sides expects for the facility.

GLASS-ENCLOSED ATRIUM

The control rooms are spacious and tastefully decorated, reflecting the church setting. "I wanted large control rooms, like we have in Los Angeles," Sides explains. "I wanted them on a grand scale. It was quite an undertaking to design a front wall that could support the monitoring system and match the scale of the rooms. That's something that Peter Maurer [of studio bauton, Sides' architectural partner in the design] was able to do very nicely." On the subject of design, both Belz and Sides say they had no preconceived notions of what the ultimate

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design would be like. Instead, they let the space of the church determine much of the layout. "And the church was very nicely set up for that," says Sides. "It had a lot of interesting acoustical properties." Each control room (A and B are nearly identical) has an approximately 4-foot bass trap in the rear wall. Studio C had initially been slated to be a client lounge, until Belz suggested turning it into a small, less expensive overdub room.

Maurer, for whom this was a first-time collaboration with Sides, was initially brought in to transfer Sides' vision onto paper and to address the architectural and code concerns, particularly the linking of the church and the adjacent rectory building. Maurer designed a glass-enclosed atrium between the two, as well as a glassed-in staircase in the rear of the church. Another part of studio bau:ton's mandate was to ease the aesthetic transition from decorous church to high-tech control rooms. Bau:ton was recalled to the project in late 1995 to help Sides with mechanical isolation problems he was encountering in the monitor walls. "Allen is a brilliant person when it

comes to these things, and it was a pleasure working with him," says Maurer. "But once you were into the project, it became apparent how complex it was. We developed a kind of acoustical/structural response to the front wall issue. We had to find paths within the building through which to run all the wall supports and at the same time make sure that none of them touched any existing part of the building. All the noise energy had to be dissipated without any coupling with the main structure. There's no easy way to describe it, but it worked."

NASHVILLE BUSINESS

Allen Sides and Gary Belz see the same potential in Nashville that many others have predicted for years: They see it becoming a music market larger than its country origins. But Nashville has never been able to shake its popular image as only a country music location. Many of the major studios in Nashville were started by engineers and producers who already had a considerable stake in the country music industry, and their studios have been oriented toward that business. This has perpetu-

ated a cyclical relationship between the genre and the studios. Although more non-country artists have moved to Nashville in recent years, most of them, like Donna Summer, Peter Frampton, Mark Farner and others, are past their mainstream prime. Nashville's indigenous pop music culture has never been a breeding ground for national success—certainly not to the degree that places like Seattle; Athens, Ga.; Minneapolis and, most recently, Indianapolis and Worcester, Mass., have. And quite frankly, many in Nashville's old guard prefer it that way; they have seen the transitory nature of pop music, and it loses hands-down in comparison to the market consistency that country has given Nashville.

Thus, any change will likely come from without. And that has been happening more lately. Starstruck Studios was slated to host tracking sessions for Bon Jovi's next record; local sideman Dann Huff was producing Megadeth's next record in Nashville studios. Both Masterfonics and Starstruck have also established daily rates in \$2,000-\$2,500 range, about 30% higher than the average upper-end rate before those stu-

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dios arrived. Belz and Sides say that Ocean Way/Nashville's rate (A and B rooms) will be commensurate with the higher figure.

Sides and Belz are betting that Ocean Way Nashville will attract mainstream entertainment recording to Nashville. They point to the general industry frustration with life and business in Los Angeles and New York, the historical links between Los Angeles and Nashville (country producers/label heads Tony Brown and Jim Ed Norman have been regulars at Ocean Way in L.A., and much of Nashville's current elite has roots there) and to the level of technology and service that the new studio will offer.

"I'm a business man as much as a studio owner," says Sides. "I looked at the numbers before we came. I think what we can do here is provide a forum for non-Nashville clients that didn't exist before. I like Nashville and have always had good experiences here with the other studio owners and with the Nashville musicians. And I think that a lot of clients that have worked at Ocean Way in Los Angeles over the years will come here, too."

Both Sides and Belz will bring their own production projects to their new Nashville facility. Sides is currently producing two records for Disney and has stated that they will be partially done there. Belz, who is music coordinator for actor Steven Segal's forthcoming release—as well as running a production and publishing company—will also do some of that work in Nashville. Belz adds that he expects much of Ocean Way Nashville's clientele to come from outside Nashville, and he anticipates some of the R&B and blues business from Atlanta—something that's never happened in Nashville. Ocean Way Nashville will also serve as a base for Sides' and Belz's equipment rental company and for Ocean Way to Go, a custom service that sets up temporary but sophisticated recording studios in clients' homes.

Local studio owners have evinced curiosity about the studio during its lengthy construction period. But even with Nashville's rate structure in flux due to a spate of studio openings in the past three years, Ocean Way Nashville's final arrival has produced no palpable apprehensiveness among them. "I'm

looking forward to it, actually," says Carl Tatz, owner of Recording Arts. "He says he's bringing in work that might not have come here otherwise, and I'm hoping that there's spillover for the other studios in the area."

Neither Belz nor Sides sees Ocean Way Nashville competing with existing studios in Nashville so much as augmenting them by bringing in an entirely new client base. At the same time, they want to keep Ocean Way Nashville's procedures distinct from the traditional Nashville *modus operandi*. For example, Sides did not hire his management team locally—a decision that underscores Sides' assessment of why more mainstream music hasn't been made in Nashville. "The control rooms here have tended to be small, as have the tracking rooms," he says. "And the maintenance is sometimes [inconsistent]. Many studios don't even have staff seconds. For us that would never be an option. I have complex control rooms, and I want seconds who know the room. The studios [in Nashville] are nice, but they just haven't been able to do what Ocean Way does. There's simply never been anything like this here." ■

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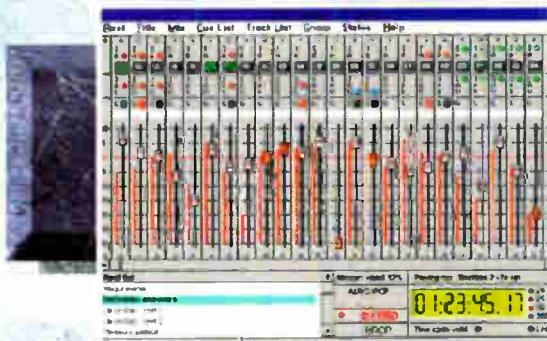
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Tapeless recording is becoming increasingly common as engineers and producers adapt to new technology. Certainly, disk-based systems offer instantaneous random-access and editing capability, but even simple functions—such as do/undo and the ability to save multiple versions—become extraordinarily powerful advantages over working in tape.

However, as with any medium, disk is not without its inherent problems. While digital editing is increasingly popular, many people shy away from tracking to disk, mostly due to incompatibility problems and slow, kludgy backup systems. Here are a few words from some

recording F. Alton Everett's *Critical Listening and Auditory Perception* educational series, available from Mix Bookshelf. He soon moved to Nashville and opened the doors of Studio C—named after the former RCA studio where it resides—on April 1, 1992.

"There were enough projects and enough indication that the client base was growing, that I decided to commit myself to the next highest level of equipment," explains Bogert. "The concept of hard disk recording just sort of clicked with me. I think what I was doing was relating it a lot to the visual arts, image processing and

Making the Tape-to-Disk Transition

people who have made the successful transition to disk-based recording.

FRED BOGERT Studio C, Nashville

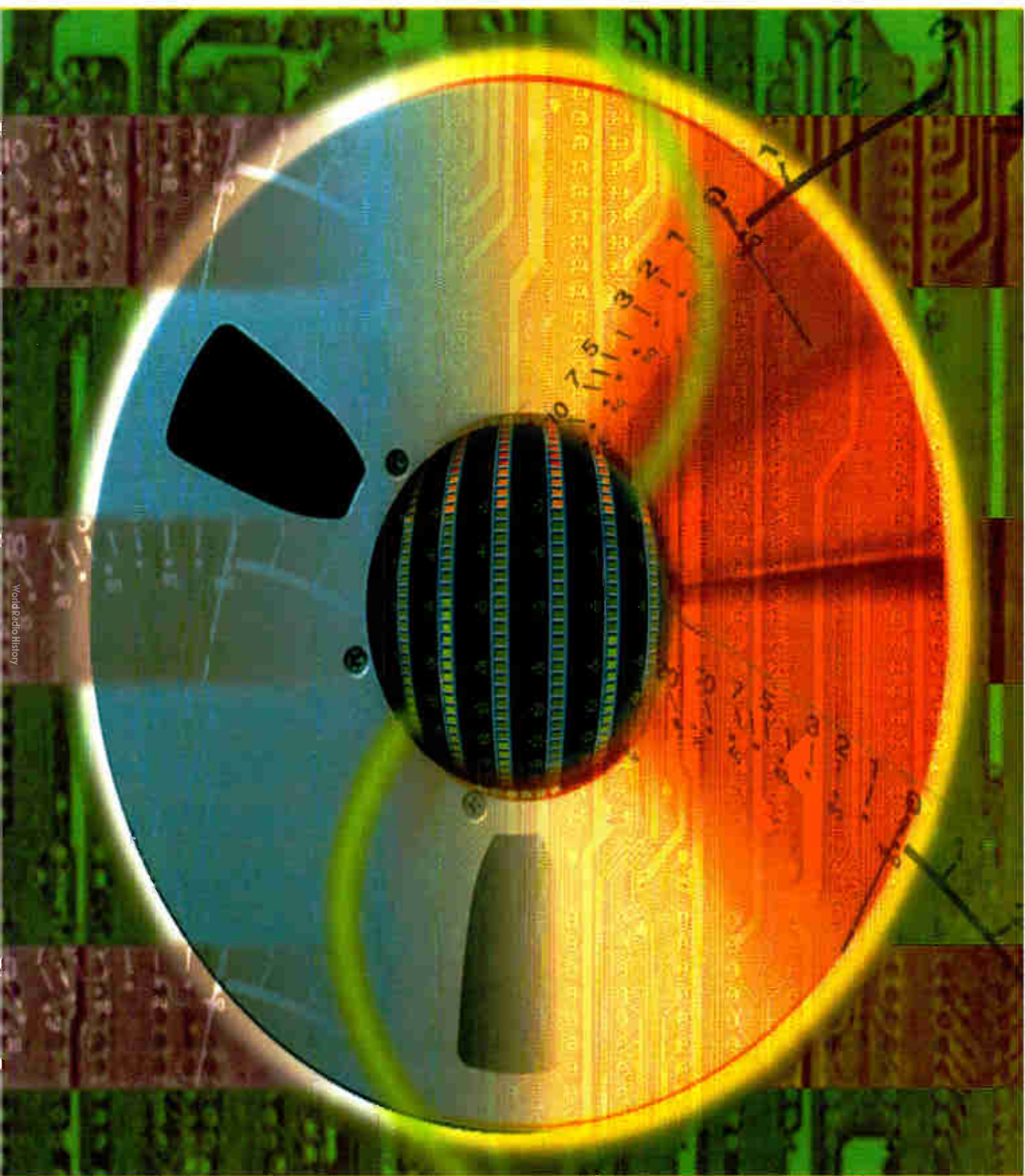
Fred Bogert started hard disk recording in 1991. He was visiting a friend's studio and happened to catch a Spectral demo; he bought an 8-track system on the spot. At the time, he owned a studio in Florida and was doing commission work, MIDI orchestration, and demo material development and project development with artists such as Gary Stewart and Tanya Tucker, in addition to producing his own projects, including re-

editing that you do with visual images; that concept translates extremely well to hard disk. As a matter of fact, the name of my facility back then [in '91] was Music Processing Lab. Because instead of image processing, I was music processing."

Asked if the transition to disk was gradual, Bogert says, "It was more like leaping off of a burning building. I saw a concept that really made sense. It would be the equivalent of an oil painter discovering watercolors—just immediately relating to the advantages and idiosyncrasies of that particular medium. The main thing creatively that attracted me to that as a music producer is that it's so flexible, and it takes the heat off of the musicians, so that they can play much more intuitively—they don't feel the pressure of the creative moment. They can be much more capricious; they can take more chances."

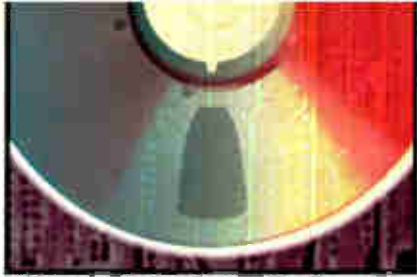
Bogert says that since he made the transition to

By Sarah Jones



WorldRadioHistory

Illustration: Tim Gleason



hard disk, he thinks more empirically; he's less constrained by his medium. "Analog recording is much less transparent of a platform," says Bogert, "and so what you usually end up with is a recording environment where you're dealing with people who are used to recording a specific way, using a specific set of equipment, and knowing ahead of time what the colors are going to be. So analog folks choose their microphones, choose their input devices, choose their tapes, choose their platforms, in anticipation of how the sound is going to be colored. There's a lot more cookbook recipes in analog recording, to me—and I don't mean to sound condescending about it at all; it's a very valid process. But it doesn't give you anywhere near the flexibility that a transparent platform gives you. A lot of time you end up with performances

YOU CAN TAKE IT WITH YOU

WORKSTATION RECORDING ON LOCATION

by Dan Daley

In Nashville, where there are more recording studios per capita than anywhere else in the world, space is at a premium. That's what Herb Tassin—a freelance engineer from New Orleans and former co-owner of Midtown Tone & Volume in Nashville—thought when he sold out his share of that studio and, with the purchase of a Fairlight MFX3 Plus multitrack hard disk recorder, moved into what is becoming a newly redefined portable recording field. "It was a natural evolution," he says. "Like many engineers in Nashville, I already carried a rack of outboard gear, mics and monitors. I had been working on the MFX3 at Midtown, where we had done records for Diamond Rio, Blackhawk, ZZ Top and others, and I was bowled

over by the MFX's performance. Producers and artists loved the creative possibilities the MFX introduced to the recording process, and I wanted to have access to one no matter where I worked. So I decided to get an MFX3 Plus and put it on wheels."

Tassin's newly purchased MFX3, the first "Plus" system in Nashville, is augmented by an Otari MFC-24 format converter (a must, he says, for digital transfers to everything from 3348s to ADAT), a pair of Genelec 1031A powered monitors, an engineering rack including API, GML, Neve and Telefunken processing, and a small Mackie console, all loaded into flight cases. Tassin says the setup is easily integrated into a variety of environments, from state-of-the-art

—CONTINUED ON PAGE 56



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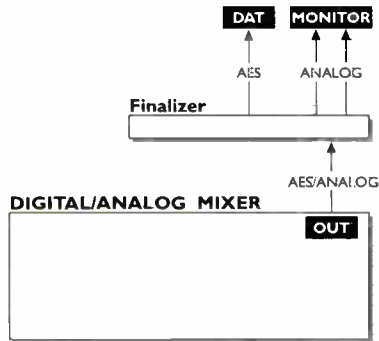


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that end up being a lot more intuitive, a lot more dynamic, whatever you want to call it, and perhaps the end result is not that much different from analog, but I just like the process better, for the way I like to work with music and musicians."

With the advantages of tracking to disk comes a responsibility in learning, Bogert says. "I think there's too many people that dive into the hard disk without understanding that you're

changing media when you're doing that. And again the analogy I like to use is watercolors to oil: It's not something you're just going to do in an afternoon. I've seen people get a hard disk system and treat it the way you would treat a peripheral thing that you're acquiring for the studio, like if you buy a new preamp. It's not that easy, and that's unfortunate. I've been working with this stuff for six years now, and I'm still amazed at the limitless possibilities of hard disk."

MARC AUBORT

Elite Recordings, New York City
Marc Aubort, along with his partner,

—FROM PAGE 54, ON LOCATION

Music Row studios to live venues, even an artist's living room. "Nashville has a thriving creative community with broad influences and a lot of really cool music that deserves to be heard. Time is money, and if I can make a tool like the MFX3 Plus available to artists with diverse budgets, then the music benefits.

Tassin's first experience with hard disk recording was during work with producer Mike Clute on the first Faith Hill record, in 1993. "At the time, [the MFX system] was 16-track and could only record two tracks at once, which made it perfect for overdubs," says Tassin. "It was immediately obvious that where tape had served as a recording medium, the MFX was a creative tool. Track layering allowed almost unlimited passes on any overdub, so that 'one more pass' for the guitarist never meant erasing the last pass (the producer's favorite).

"If I have to give one word to describe the changes in my approach to working since going to disk, I'd have to say 'freedom,'" says Tassin. "Once you become accustomed to effortlessly moving musical phrases or single notes in time or pitch, the notion that audio becomes irrevocably stuck to a piece of tape seems very, very archaic. Which is not to suggest wholesale surgery on the fine lines of an artist's musical fingerprint. But if that artist can accomplish something in a single edit that he believes makes his recorded performance closer to what he hears in his head, then let's cut and paste.

"Any system is only going to perform as well as the person operating it," concludes Tassin. "And a disk-based system is going to require a certain amount of manual reading and hands-on if you're going to derive all the benefits it can offer. Do a few low-pressure practice sessions before you track with the double-scale A-team session players. Develop your technique on the system; in the hands of a good operator, a disk-based system can dramatically increase the tempo of a session, and believe me, producers and artists notice." ■

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Joanna Nickrenz, runs Elite Recordings in Manhattan. Aubort began his career as a classical engineer in 1950 at the beginning of the LP era, in Switzerland. He then moved first to Vienna and later to the United States for Vanguard Records, where he spent eight years as chief engineer before becoming independent in 1965.

Since the beginning of his career, Aubort has recorded exclusively classical music, working strictly in 2-channel format, and he's seen all of the incarnations of digital recording media, from JVC's 900 video-based system to Sony's PCM-1610/1630 to PCM-F1 Beta to DAT. Three years ago, he bought a SADiE workstation. "In the beginning," says Aubort, "I did not record on hard disk, because I had all sorts of visions that it could crash on a session. I was actually advising people not to do that, because it was foolish to trust the hard disk, but Tony Faulkner in London convinced me otherwise. Then came

Exabyte, also tape, unfortunately, but nevertheless, it's a fairly reliable back-up system. So what we do is at the end of [a recording] session, we unload onto Exabyte tape all the 20-bit information we have on hard disk, then reuse the hard disks, and hope everything is on the Exabyte. So far, it's worked very well.

"Whatever we [record] on the SADiE system, we run parallel on two DAT machines, just in case something happens with the tape, or with a drive, or if the drive crashes, or whatever," says Aubort. "This gives us 16-bit back-up, should we ever need it. The recording and editing can be done in 20-bit format to the final approved master, which is then dithered down to 16 for CD production."

Aubort says the obstacles he faces with hard disk recording have mostly been the normal glitches and problems found with computers themselves. "Everyone who has worked with computers has enough horror stories to tell about things that could go wrong," he says. "When everything works, it's great; same thing with digital in general—either it works great, or it doesn't work at all.

"It is not an easy decision to make," Aubort says of making the shift to disk, "because you really expose yourself to some lurking technological mishaps, but once you have made the transition, it's easier to [work on a workstation]. You can work at 20-bit, which you cannot with DATs. It has some advantages, inasmuch as it's the storage medium for the future. To store anything on tape, whether it's Exabyte, DAT, U-matic, VHS/Beta, whatever format except possibly analog Dolby SR, which seems to be the most durable of all tape media, is foolish for any archival material. We are involved in recording a six-year project of 23 CDs to be released in 1999. All this material has to be shelved until ready for sequencing at a future date. So what we do is, when we finish editing, we cut a CD in addition to the 20-bit Exabyte and two DAT back-ups. If all else fails, then CD will be the prime retrieval medium. So in this case, it has made things a lot easier, to completely bypass the U-matic format to digital. To record directly into the hard disk, work in hard disk, do the final product on DDP [Exabyte 16-bit] (which we use to glassmaster directly), is highly efficient and cost friendly. And

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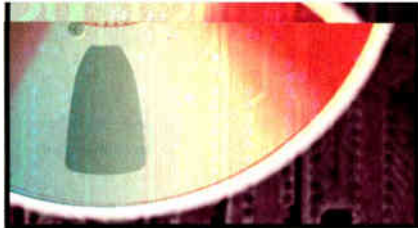


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**TOM FLETCHER,
STEVE LUKATHER, BILL SMITH**
Steakhouse Studios, Los Angeles

Tom Fletcher and Steve Lukather, independent producers in Los Angeles, had talked for years about building a studio together. When they finally put their plans into action, they brought in Bill Smith, then a staff engineer at Capitol Records (and a Grammy nominee for Best Engineer for his work on Toto's *Tambu*), and the three established Steakhouse Studios in Los Angeles. Originally conceived as a personal studio, Steakhouse opened in January and was booked immediately through the first six months of operation with projects that include a Jeff Beck album and Lukather's own solo album.

Fletcher was the one who introduced the idea of disk-based recording. "I did the new Yes record, *Keys to Ascension*, and through the course of that, I met Dave Tinsley from Sonic Solutions." Fletcher had to be convinced to

record into the system, but once he did, he was hooked. "It sounded so good, I wanted to mix in the computer," he says. Smith concurs: The Sonic system "gave Tom [Fletcher] the ability to do things, to record the band how they used to, in sections, and not necessarily have to go through the grunt work of editing 24-track tapes together," he says. "It opens you up to be able to do anything creatively, anything your mind can think of in terms of arrangements, and putting together different takes of songs, and editing. I'm an analog fanatic myself, and what's interesting is the marriage between the two technologies in our studio. We've got the Studer 24 analog, and the Ampex ATR 1/2-inch [2-track], and then we have the Sonic system, and we make it all work."

"It depends on the situation," says Lukather (best known as a hot L.A. session player and singer/guitarist for Toto). "We can record into the Sonic, just like a tape machine. If you've got a band that's not a 'first take' band, and you want them to do a few takes, you don't waste tape. You can go directly into Sonic Solutions, get the pieces, put it together and then blow it on analog to get the analog sound,

then go right back into Sonic, and there you have it. It's marrying all of the technology together. By the time it gets down to two tracks, no one knows what you did, as long as they're grooving."

Smith agrees that the end result is what counts. "We experiment a little bit to see what works best. And [recording to disk is] a hard thing to get used to. Everybody's so many years into using analog machines, and putting their faith into a 24-track. It's a hard sell. But it's not a replacement of old technology; it's taking the new and integrating it with what already exists. That makes it really powerful."

"I remember," says Lukather, "back in '77, when they first started linking up two 24-tracks, the guys in the lab coats would come over and it would take 30 seconds for the two machines to lock up. And now the new technology moves along so quick, and the options are amazing. It's almost like you have to stop yourself from going crazy with it, because you could spend all day long just goofing around with it, and if you made a mistake, you're not saying, 'Oh my God, we just cut the master.'"

"And that's the thing that gives you

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**Sometimes I wonder what used
to happen while we waited for tape
to rewind. —Paul Schwotzer**

free license to do whatever your mind could come up with," says Smith. "You're not working with this fear that once I put this razor blade to the tape, that I'm committed, and I could really be doing a horrible thing. If it doesn't work, undo. And you're back to square one."

"Make sure you're backing up stuff all of the time, because when it dumps, it dumps," says Fletcher. "If

you have a back-up then you're really happy, but if you don't you cry really, really hard. And I have cried. And that is part of the technology; that is the one thing that you just have to get

used to, is constantly dumping down to Exabyte, Jaz drive, whatever you're using. But the good outweighs the bad, and it doesn't scare me away from it; you realize what it is you need to do to take care in that situation, and then keep moving forward."

"I would say to anybody who's thinking about whether or not they should [make the transition to disk], the answer is to dive in immediately," says Fletcher, "because the longer you fear and procrastinate jumping into it, the farther behind you're going to get. Technology is moving so quickly that what you're using today, next year is going to be archaic. So jump in—don't get rid of your analog machines and your cool old stuff, but get into the new technology and incorporate it. Our concept is to have fun. And digital technology allows you to have fun. You're not in there drudging through, you're making up stuff and you're having a good time. We like to laugh and have a blast—that's what we got into it for."

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previous take that would have been lost on linear tape.

I can't describe the moment in time that I decided to go ahead and get a digital workstation; I had worked with a 2-track disk system for mastering, and I just sensed the potential of such a system. I migrated from digital tape to Pro Tools about a year-and-a-half ago; I chose a system with plenty of industry support and a company that would likely stay around."

Schwotzer says that although he makes a valiant effort to read all equipment manuals, he learns a lot just by using the system. "I still use my Mackie board most of the time for external mixing. DAW signal processing resources are limited, and this allows me to 'play' the faders. It took me awhile before I did any bouncing to disk because I was still in that old frame of mind, using Pro Tools as a flexible recorder, but not so much as a digital mixer. Over time I have discovered new features, and I've shifted more into digital mixing. Activities such as doubling signals in a matter of seconds, removing constant noise from a signal via software plug-ins, cleaning up studio chatter, and using cut-and-paste techniques to create the 'performance that never really happened'—this is where my digital workstation really shines.

"Sometimes I wonder what used to happen while we waited for tape to rewind," Schwotzer says. "Did the guitarist go off and think up a new riff? For the most part, many of the musicians that I work with also have day jobs, and since studio time is valuable, we all benefit from the system's speed. It's best if the recording system is waiting on the musician, not vice-versa. A fast and flexible recording system allows maintaining the energy flow of a session.

"However, for all the time you save in tape transport, all you need is one system crash to require a 10-minute coffee break," Schwotzer warns. "The system isn't flawless in that regard. Fortunately I've really not had any disk crashes, but I have to remind myself that all these wonderful performances are only as safe as the latest backup.

"If someone can afford it and they're as passionate about music and engineering as I am, I'd say by all means, go for it," Schwotzer says. "There's so much that you can do with a system like this, to not go this route is really limiting all the fun that you could be having." ■

Sarah Jones is the assistant editor at Mix.

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JOHN LEVENTHAL

MUSIC WITHOUT ARTIFICE

John Leventhal is the first to point out that he has yet to produce a hit. *Commercial* hit, that is. He *has* produced several critically acclaimed, *artistic* successes. Take, for instance, Shawn Colvin's memorable debut, *Steady On*, Marc Cohn's *The Rainy Season*, Patty Larkin's *Strangers World*, or Rosanne Cash's *The Wheel* and *10 Song Demo*, which the record company insisted on releasing in its raw demo stage.

"Everyone would love a hit, and I don't think anyone did anything consciously to sabotage it, but I've tended to work with artists who aren't as hit-driven as others," Leventhal states. "Their songs are really reflections of who they are. I've started to have the feeling in the last couple of years that I could probably do it if I put a little attention to it, but there's just so much you can do as a producer to get a hit."

He actually feels he may just have his first hit with some of the material on Shawn Colvin's new record, *A Few Small Repairs*. "Both Shawn and I have come a ways in the last seven years," he says. "We were both really ready to be more spontaneous and intuitive and we didn't labor over stuff. If something sounded good right away, we said, 'That's good, let's not mess with it. Let's not work that part to death.' We really tried to stay in that mode and retain a sense of mystery. We wanted the record to have a slightly mysterious, amorphous quality to it. At the same time, we wanted it to be accessible. And that's a balancing act."

Leventhal has also always been cognizant of the producer's dilemma of infusing a project with his own style while bringing the artist's vision to fruition. It's a particularly fine line when a producer is hired to contribute his songwriting and playing abilities, as well, as Leventhal knows—he has co-written with



nearly all the artists he's produced, in addition to writing songs covered by other artists such as Patty Loveless, Vince Gill, George Strait and Shelby Lynn. He admits that sometimes he'd love to oversee a record with a very focused band. "I'd love to be the guy who sits back and lets them do their thing and makes one or two important comments," Leventhal says. "I think it would be liberating. A side of my creativity would come out that hasn't yet, and I'd learn a lot."

A native New Yorker, Leventhal believes he learned a lot from his days as a musician in the '80s. He spent a lot of time playing the clubs and bars of New York, most notably as a sideman/guitarist in Steve Forbert's band, before hooking up with a fledgling Colvin. "I don't think I ever consciously said, 'I want to be a record producer,' but looking back, I can see that this is what I wanted to do," he says. "I was always interested in the way records sounded, and I always tended to be the guy who did the arrangements in whatever band I was in. And I liked writing songs, so at some point, I realized I need-

ed to go to the next step. The timing with Shawn just worked out great."

He describes his first production project, Shawn Colvin's *Steady On*, as a "serious learning experience." They had been in bands together and hit it off as writers who demo'd their collaborations. When she asked him to produce her first record, it was a natural progression of their working relationship.

"The demos were good, I guess," he says. "In fact, to this day, we both say we really like the demos better than the first record we did. I had a vision of how I wanted things to sound—or I thought I did, anyway—because I had done these demos and they were pretty explicit. They clearly represented something I was hearing, but I didn't have the technical and/or other knowledge to facilitate that happening," admits Leventhal, who has since learned how to engineer. "There were two things I learned—and they're kind of diametrically opposed. One was how to let go. I learned that I can't control every moment, but the other side was that I really learned that my intuitive sense is the best weapon I have. You know the typ-

BY ROBYN FLANS

ical situation where you're looking for something, and somebody who is maybe more technically minded either doesn't get it, or says you can't get it, and you tend to say, 'Oh gee, okay.' But I realized whatever it is I'm intuitive in feeling is probably the right thing, and I should honor and pursue it. I can tell that some artists I work with have been straight-jacketed in the studio, where they've walked in and been told things like, 'You can't play on the tracking date because your time isn't good,' or 'You can't have this or that,' so they feel handcuffed by that. I always say,

'Screw all that. Whatever it is you want to do, let's start at that place, and if for some reason it's really not working, we'll deal with it. Start with the thing you're hearing.'

He notes that on his second outing, Jim Lauderdale's *Planet of Love*, which he co-produced with Rodney Crowell, he didn't trust his intuition enough. "I was a fan of Rodney's and he was older than me, so my feeling after *Steady On* was, 'I just did this record where it was a real issue to be in control. I'm going to go into this other record and do it differently. I'm going to see what Rodney can teach me.' Although I'm really proud of that record, I don't like the

way it sounds. It sounds small and constricted to me, and the whole time we were making it, I thought it sounded small and constricted. I'm sure I said something about it, but I didn't have the language to come up with the alternative. Both Rodney and [engineer] Roger Nichols are wonderful, but I was hearing something in my head and I didn't pursue it, so that was a turning point for me. I felt I had tried both ways and came to the conclusion that I need to follow my intuition and have some patience for whatever process the record takes. With every record I do, my process gets easier."

He says he likes how Marc Cohn's *The Rainy Season* came out, as well as

**Everyone would
love a hit,
but I've tended
to work with artists
who aren't as
hit-driven.**

Patty Larkin's *Strangers World*. And though it was not a traditional record production, Cash's *10 Song Demo* holds a special place for him. "There's something I like about that record because there was no artifice to it," he says. "It was almost pure. Even though sonically on a lot of levels there are things that are messed up about it, when I listen to it, I think it's pretty pure and honest, and I wish every record I did could be like this. Of course, that record will never get played on the radio, but artistically, it was very satisfying.

"There's one song, 'List of Burdens,' where I'm unfortunately playing drums—I'm not a real good drummer," he laughs. "but we were doing it live, and I was playing this little drum thing along with it. It sounded too normal, so I took an old 12-bit sampler I have and played drums into it. The sampler automatically de-hi-fi's the sound because it has very low resolution. I got a good two-bar loop of what the groove was, and then I played my little drum part on top of it and it changed everything. It made it sound quirky and a little off-center and a little more resonant. Otherwise it would have sounded like a country song, but with that little loop, it sparks you."

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World Radio History

That was his second project with singer/songwriter Cash, who is now his wife. They had met in Nashville, and she, having been a fan of Colvin's *Steady On*, asked Leventhal to produce *The Wheel*. "Rosanne is a very spontaneous, intuitive person, and her agenda was that she did not want to make a commercial country record," he explains. "I wasn't really invested in who she had been. To be honest, I wasn't super familiar with her, other than the hits, so there was no agenda. I figured we were just going to pick colors, sounds and different ways of arranging the tunes and that our palette was going to be much broader than she had ever done. In retrospect, I wish I had made a simpler record with her; I think that record is a little too overblown, productionwise, but that's also a process. I feel I know Rosanne better now and have a much better sense of who she is as an artist. If I do her next one, it's going to be a lot simpler—a jacked-up version of *10 Song Demo*. Drums can play and things can rock, but it will be less in the sense that it will not be complicated."

That was the approach Leventhal took on Colvin's new record, *A Few Small Repairs*, as well. "I consciously decided not to get too fancy. I didn't want to feel I had to manipulate everything. I had the attitude of, 'If these songs are great, just play them.' Everybody sonically manipulates now, and you have to be careful not to do it just because you can. You really need a reason to do it. In that sense, we're all children of George Martin and The Beatles. It's unbelievable the influence they've had on us. Those records are still the Bible to me. We continually go back to them as if we're going back to a manual, learning how to sonically manipulate things for exciting and emotional results when the technology didn't really exist. They were a great example of really utilizing your limitations instead of having unending possibilities. Limitations can be amazing and really breed personality and uniqueness."

On Colvin's "I Want It Back," a bizarre sonic accident occurred. "I had played the demo to this little loop I made where I hit my snare drum just with my hand so it was a very muted sound. But the track kind of rocked, so when we jacked it up to really making the record, it needed to be a bigger drum sound, which we had a hard time getting. It was a lot of experi-

menting, and finally we got a drum track with Shawn Pelton, the drummer, putting towels on his drums. I'm a big fan of dead drum sounds. Then the accident took place. Later on, when we were overdubbing, we were looking for an effect to put Shawn Colvin's voice through. I'm a big fan of Leslie, and Fender made this thing called a Vibraphone for a brief time, which was their version of a Leslie. I love mine and use it on a lot of stuff, but I hadn't used it in this capacity. Accidentally we patched the entire drumkit through the Leslie and we all went, 'This is amazing!' The song starts out only with the drums through the Leslie, and through

the rest of the song, it's a mixture of drums and Leslie, which was perfect because the song is a very anxiety-ridden, quirky song with a sense of humor."

For Leventhal, the arrangement of the song dictates how the music is played. "My process now, for the most part, is to go in and track with a band and the artist and try to get as much done as I can. I track to 2-inch and bounce them down to ADATs and take them back to my studio and do my thing. I play a lot of instruments—guitars, keyboards, percussion. The artist can come in and tweak their vocal, we can do background vocals, and there's



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no pressure in my studio. My studio is a studio, but Marc Cohn affectionately dubbed it 'The Shit-hole.' I've got my ADA'T, a Mackie console, a Millennium Media mic pre and a Tube Tech compressor and some good mics. Part of my thing is I have a million guitars and lots of instruments, and we play. All the artists I've worked with like it because they don't have that feeling that the red light is on, even when the red light *is* on.

"In the studio I guess I like Neve consoles. I have favorite things, but I've got to tell you, at the end of the day, none of it really matters to me. It's really about the music. I book a studio for a lot of reasons. Vibe is really important. If I like the people and there's a good place to hang out, I'm basically happy. Gear is a reason and microphone selection, as well.

"I love AKG C-60s for acoustics and I even went out and bought one," Leventhal continues. "For vocals, you gotta at least try a 47. It's not right for every artist or every song. I really like 49s, which are harder to get. I tend not to really like bright mics like a C-12, and

that was always the thing for me with acoustic guitar, because most people seem to love it for acoustics, and I'm not a big fan of that real crystalline acoustic guitar sound. I like it in a solo acoustic guitar setting, but in a track I'm

**In a sense,
we're all children
of George Martin
and The Beatles.
We go back
to those records
as if we're going back
to a manual.**

always hearing the way those strummed guitars sounded on Beatles records. So that AKG C-60 was a really good compromise. It's kind of warm, but it still articulates the nuances of each string really well.

"Most of the studios I work at have the kind of compressors I like—either an 1176 or LA-2A. I bought a tube-type compressor I like a lot, so I feel covered there. For other compression stuff, I have this Alesis half-rack-space compressor that's kind of grainy and ugly, but I like it for certain drum stuff."

Leventhal says he likes to experiment with his drum sounds. "There are definitely tracks where I don't even bother using the mic on the snare when I mix. I'll record it, but when it's time to mix, let's just take that out and use overheads because that's the overall sound of the drums, which sounds great to me. Of course, that's what those Beatle records [had]—they didn't have 50 mics on the drums. And that's not how we perceive drums as listeners, either. We don't perceive this huge stereo image of the drums on one side; it's one instrument. But then having said that, I'll do anything on a certain tune. I would love to just put an entire drum set on one side of the mix, but I haven't found an artist who is willing to go with me on that yet!" ■

Robyn Flans is a Southern California-based writer.

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JOHN KEANE STUDIOS

FROM PROJECT STUDIO TO BOOMING BUSINESS

Years ago, John Keane worked out of his home in Athens, Ga., recording himself and groups in which he played. It was 1980, and there wasn't much competition in town, so he also got plenty of work producing local bands. Five years went by, the engineering continued, and he bought a Tascam ½-inch, 8-track and a bunch of outboard gear. Up to that point, however, everything he knew about recording he had figured out at home—mostly by trial and error—and since there were no other engineers in town to talk to, he decided it was time to go to school. "I had gotten to the point where I felt like I had gaps in my knowledge," says Keane, "because there is only so much you can teach yourself, and I had had very little outside studio experience."

Keane checked out available recording programs before deciding on The Recording Workshop in Chillicothe, Ohio. "I chose The Recording Workshop," Keane says, "because I wanted a lot of hands-on experience in a short amount of time. Six weeks was as long as I could afford to leave my business, and the tuition was very reasonable. I learned a great deal about signal flow and mic technique, and I got to bounce a lot of ideas off experienced engineers, which was something I had really hoped for."

After graduating from The Recording Workshop, Keane returned to Athens and bought a 1-inch, 16-track. He started doing more actual album work with regional bands, and did some demo work, Christmas singles and B-sides for locals R.E.M. In 1988, he bought a 24-track and expanded his studio further, building a new, larger tracking room. Bigger projects began rolling in, including major label projects for the Indigo Girls and some album work for R.E.M. "I really sort of moved up



just an inch at a time, over a period of 12 years," Keane says.

Before long John Keane Studios took over the whole house—so Keane bought the house next door, where he lives with his wife and three children. He has since built an even larger tracking room with hardwood floors and vaulted ceilings; his current console is a Trident 80B, and he has an Otari 2-inch, 24-track, a Pro Tools system and a Sony digital 8-track. "That's basically the heart of the system," Keane explains. "I've made most of my equipment purchases with tracking in mind. Mic preamps like my Neve 1064s, Shep 31105s and the Amek 9098s have proven invaluable for getting good sounds to tape. I recently bought some Coles 4038s, and a pair of the new Earthworks microphones, which I'm very happy with. My favorite is an old Neumann M269 with a Stephen Paul capsule." Since most of his business is tracking work, Keane keeps his outboard gear simple; if he's involved in a major mixing project, he'll either rent high-end processing gear or take the project

to Nashville or Atlanta to mix.

It may have been a long warm-up, but Keane's career really came to a boil last year: He started the year recording singer/songwriter Vic Chesnutt for his new album on Capitol, *About to Choke*. Then he went to work on R.E.M.'s latest, *New Adventures in Hi-Fi*.

That project lasted three months, and when he finished, he started recording the first Geffen release for the 10,000 Maniacs (the album was later mixed by Michael Braugher). "That took me about halfway through the summer," Keane says. His next project was producing Widespread Panic's *Bombs and Butterflies* album (Mercury/Capricorn), assisted by Clif Norell. Then he produced, recorded and mixed an album for Arista Nashville artist Robert Earl Keen. At one point last summer, Keane says, he worked about 60 or 70 days straight, trying to get each album finished so he could start the next one. "It's been incredible—I can't believe I managed to cram all that stuff in one year." Keane mostly does his own mixing and engineering; his assistant, Billy Field, juggles assistant engineering, answering the phone, and aiding Keane in various tasks. "Except for my assistant, Billy, it's pretty much a one-man operation," he says.

Hard as it will be to top the past 12 months, Keane says it's getting a little bit better every year. But as far as expanding the studio, he doesn't have any plans for making it larger. "I've added on to my house twice, and it pretty much takes up every square inch of the property," he says. Tops on his wish list is a new, still bigger board. "My dream console would probably be an API Legacy," Keane says. "Those are really nice, but that's a big chunk of change. But if I have another year like last year, I might be able to go out and get one!" ■

BY SARAH JONES

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SHOCKWAVE AUDIO

With the World Wide Web leading the Internet away from its roots in academia and government, commerce and entertainment have joined information as essential elements in the Web mix. As with the CD-ROM before it, the Web has had to broaden its appeal to the senses to make these new applications compelling to consumers. The once text-oriented medium has expanded its palette of media types to include graphics, animation, audio and even something that might loosely (very loosely) be called video.

Compared to problems in the evolution of CD-ROM, the obstacles to bringing multimedia to the Web are vastly more challenging, particularly in the key area of data throughput. The starting point for the CD-ROM—those single speed drives long since abandoned as ridiculously slow—pumped out data at least 40 times faster than a 28.8kbs modem connection operating at full theoretical maximum. And upgrading from those early drives to today's 10x models is as simple as hooking a faster drive to one's computer. A comparable tenfold increase in data rates for the average Internet consumer will likely await the replacement of the nation's entire remaining copper telephony infrastructure with fiber-optic cable, or perhaps a massive shift to cable TV companies as the core Internet service providers. Either way, the change will be years in the making.

If you can't make the pipe bigger, you have to make the volume of data smaller. Thus drastic data compression techniques will be the norm for the foreseeable future when it comes to delivering real-time media ("streamed," as opposed to downloaded before playing) over the Net. So what do you

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get when you try to compress 16-bit/44.1kHz audio (1.4 Megabits/second) for playback over a 14.4 modem connection (which might actually deliver in the range of 8 Kbits/second)? Frankly, not much. With less than 1% of the original data present, it's no surprise that the fidelity is, to be polite, "compromised." High fidelity, however, is not necessarily required for promotional applications in the music industry; for record labels and online record stores, the goal is simply to give consumers a feel for the music so they can see if they want to buy it on CD. The fact that such highly compressed sound is at all recognizable makes streaming audio a valuable tool for such sites.

The first company to really exploit this market for streaming audio was Progressive Networks. Their RealAudio system (covered in the April 1996 issue of *Mix*) has become a standard of sorts, with the company claiming 14 million downloads of its free RealAudio Player. So far, RealAudio has fended off challenges from, among others, Xing Technology (StreamWorks) and VocalTec (I-Wave). But the Internet stands still for no one, and a newcomer to the scene—Shockwave Audio—may yet shake up the market, or at least put downward pressure on Progressive's pricing for its Real Audio Server software.

Shockwave Audio was developed by Macromedia, a company with significant influence among the many multimedia designers turning to the Web as a new market for their services. The audio delivery scheme is a component of Macromedia's overall Shockwave product line, which includes a free browser "plug-in" to enable end-user

BY PHILIP DE LANCIE



Figure 1: Macromedia's Shockwave Gallery provides links to music sites using Shockwave audio.

Figure 2: Macromedia's suggested settings for band-limiting audio files in SoundEdit 16 before exporting them as 16kbps .SWA files

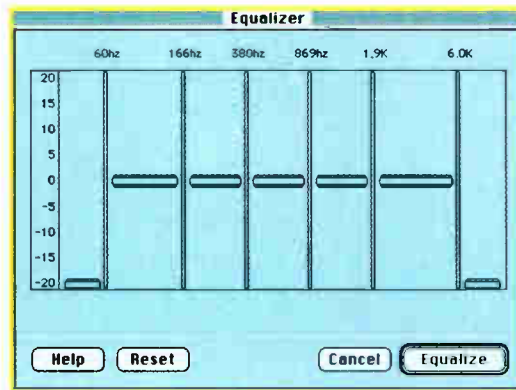
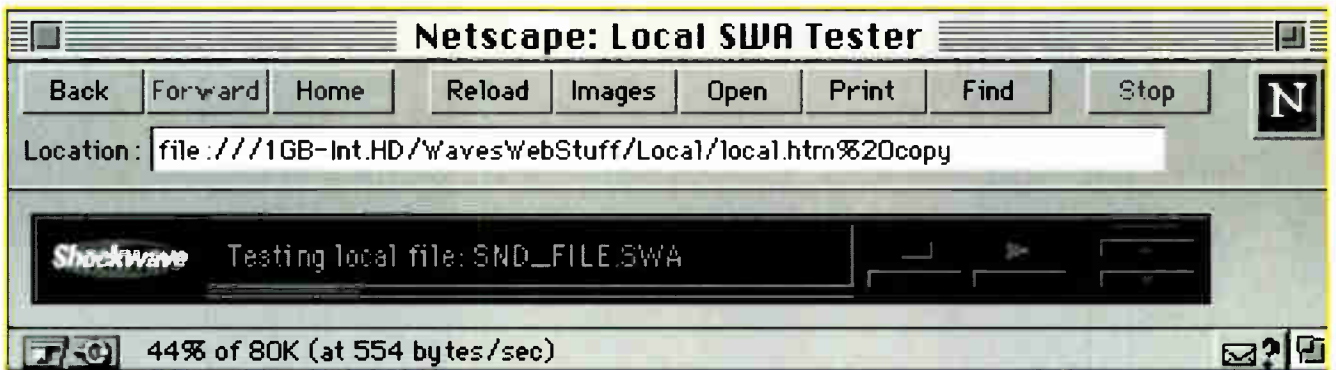


Figure 3: This HTML page shows the embedded Shockwave movie "player.dcr" included with the Shockwave Streaming Audio Toolkit download.



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Internet (perhaps using QuickTime), one could well imagine widespread use of 128kbps "shocked" files to deliver better fidelity at a smaller data rate than 8-bit/22kHz PCM.

Beyond compression quality, a streaming audio delivery system has to stream reliably under less than ideal conditions. HTTP (HyperText Transfer Protocol), the standard communications and server protocol of the Web, was not designed for time-based media such as audio. RealAudio and some other streaming schemes use alternative protocols such as UDP (User Datagram Protocol) to improve the reliability of transmission. This approach, however, requires the use of special server software to stream a requested audio file back to the client (end-user) and may cause problems for would-be users protected by "firewall" network security systems. The cost of this special audio

server software is far from trivial; RealAudio's prices range from \$595 for a server supporting five simultaneous streams to \$11,490 for 100 streams. Web site operators who want to handle major traffic but lack significant resources may find those prices prohibitive.

Shockwave, on the other hand, does

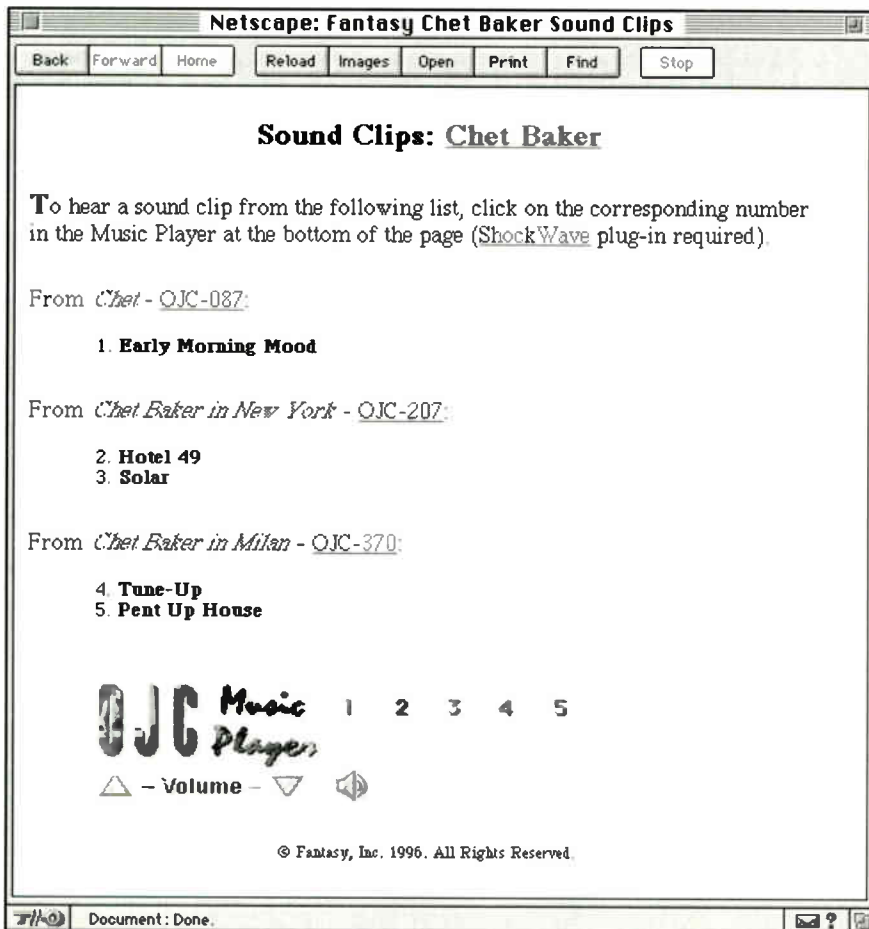
the information path by preloading more of the signal (3 to 5 seconds or more) into a buffer on the client's hard drive. The success of this strategy at any given moment is dependent on factors beyond anyone's control, such as the quality of the client's hookup and the amount of traffic on the network (factors

THE OBSTACLES TO BRINGING MULTIMEDIA TO THE WEB ARE CHALLENGING, PARTICULARLY THE KEY AREA OF DATA THROUGHPUT.

not require any outlay for special server software. It works with whatever HTTP server is used to operate the rest of the site and tries to get around potholes in

that can influence the reliability of non-HTTP protocols, as well). If poor transmission causes "dropped packets" (data lost in transmission), audible dropouts may result.

Figure 5: A prototype Music Player page from the Original Jazz Classics section on the Fantasy Records site (www.fantasyjazz.com) showing a 14KB Shockwave movie at bottom playing selection 2



GETTING SHOCKWAVE UP AND RUNNING

Playback of an .SWA file involves the interaction of five elements: a Shockwave-compatible browser, the Shockwave plug-in, an HTML page, a "shocked movie" created in Macromedia's Director authoring tool and the file itself. As the browser loads the HTML page, it encounters the Embed tag, which tells it that the page contains a Shockwave movie. The browser then loads the plug-in and downloads the movie, which starts playing. The .SWA file itself won't start playing until the buffer on the user's hard drive is loaded; depending on how the movie has been designed, this preloading may start immediately or await some kind of user input (such as clicking on a play button). When the buffer is loaded, the movie can start playing audio while the rest of the .SWA file continues downloading into the buffer in the background.

To use the Shockwave production tools to make .SWA files and a movie to play them, you first need be able to play back Shockwave movies through your browser. Shockwave-compatible browsers are available for both Windows and Macintosh machines, and include Netscape Navigator (2.02 and 3.0, final releases only), Internet Ex-

plorer 3.0 (Windows 95 or Windows NT 4.0 only), Attachmate's Emissary and Netmanage's WebSurfer. Shockwave-compatible Windows operating systems include 3.1, 3.11, 95, NT 3.5.1 and NT 4.0. System 7.5.1 is the minimum required OS for Power Macintosh machines; earlier Macs must sport at least a 25MHz 68040 CPU and need to be running System 7.1.2 or higher.

In addition to the above requirements, proper decompression of .SWA files is only possible on machines equipped with a floating point processor (FPU), also known as a math co-processor. An FPU is built-in on most machines these days but was not included on some older models still out there (including LC series Macs and various PCs). Macromedia does not maintain a list of computers that do and do not have FPUs, so users who are in doubt need to check with their dealers.

The Shockwave plug-in itself is available for download free at /shockwave/download within the Macromedia site (this and all subsequent Macromedia addresses given here should be prefaced with <http://www.macromedia.com>). According to Macromedia's site over nine million downloads have already taken place.

Installation is covered in detail in the Read Me files that come with the download, but it is worth mentioning that the user needs to set the browser's disk cache (found in Netscape under Network preferences in the Options menu) to at least 10 MB for proper operation of the plug-in. Despite this precaution, some Macintosh users may have noticed that after visiting a few shocked pages their cache fills and they can no longer open pages with movies. According to Macromedia, this problem has been fixed with the Mac plug-in version posted November 20, 1996.

One other memory note: Mac browsers will need a Preferred Memory setting of 10 MB (Netscape 2.02) or 15 MB (Netscape 3.0). This means that if you have only 16 MB of RAM and you want to use Shockwave, you should stick with Netscape 2.02 rather than upgrade. (This may not be much of a sacrifice considering how flabby Version 3.0 has become.)

LEARNING FROM SHOCKED SITES

Once the Shockwave plug-in is installed and the browser configured, it's time to check out some shocked music sites to see how they handle .SWA playback. Macromedia's Shockwave Gallery at /shockwave/new/vanguard/ is a good

starting place. The gallery features demo pages from Warner Bros. and Capitol Records and links to the actual sites of MCA Records (the site is called AMP), Virgin Records and music retailer MusicNet, among others (see Fig. 1).

One of the first things to notice in the Gallery is that it is not worth it to use large (as in big file size) graphics in a movie; as with other Web graphics, supreme self-restraint on the part of the designer is required to keep the download time from becoming unbearable for the end-user (a lesson apparently ignored at some of these sites). Depending on hard drive speed, it seems to take roughly five seconds for the

plug-in itself to load, followed by however long it takes to get the movie over the network (ten seconds or more for a 30KB movie with a 28.8 modem) and preload the audio buffer. Only then can the user actually begin to hear audio.

All the audio in the Gallery (that I encountered, at least) seems to be optimized for 16kbps playback, which suggests that nobody feels that the 8kbps compression yields an acceptable result for music (I'd have to agree). So if your sound files are more than a few seconds in duration, your audience for streaming sound will be effectively limited to those with 28.8 modems and above. However, a movie may be designed to

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allow clients with slower modems to increase the preload buffer size so they will be able to download more of the file before it starts to play. This increases their wait but reduces the chance that the buffer will be depleted before the file is finished playing.

Another consideration evident from browsing the Gallery is the fact that the plug-in loads for every page that has a movie, and unloads when you leave that page, dismissing any movies on that page. Unlike the RealAudio Player, then, a Shockwave movie does not remain active from page to page, independent of the page that originally invoked it, and therefore .SWA files cannot play across multiple pages. If you use movies on a lot of your pages, your visitors will be waiting on each of those pages for the plug-in and the movies to load. At the same time, Macromedia recommends that no more than three movies be embedded into any page, and that only one movie per page play audio.

The upshot of all this is that you don't see a lot of little in-line icons that you can click on to hear audio interspersed throughout a page. Instead, the preferred approach seems to be to create separate pages focused on listening and featuring a single player movie that plays multiple audio selections. Because Shockwave enables not just audio playback but also true interactive multimedia delivery, these player movies may be customized graphically and functionally to fit the personality of the music they play.

SHOCKING AUDIO

While Progressive Networks makes ends meet by selling RealAudio Server software, Macromedia's market is in production tools. Unfortunately, by spreading Shockwave developer materials out over a dozen or more documents on its Web site, the company makes it unnecessarily difficult to figure out exactly what tools are needed, what to do with them and how to avoid the many potential pitfalls that await in the production process.

While some useful information is accessible under "Developer Support" in the Shockwave section (</support/technotes/shockwave/developer/shock-technotes/index.html>), the key doc-

uments are the Developer Guides (</shockwave/developer.html>), including Getting Started, the Director 5 guides (especially Creating Movies for the Web, Integration with Browsers and Troubleshooting) and the Shockwave Audio guide. To really understand what Shockwave can do, these docs should be gone over thoroughly.

The basic tool for creating Shockwave movies on both the Windows and Macintosh platforms is Macromedia Director (Version 5.0 is current), a multimedia authoring program with a reputation for a daunting learning curve. Without delving into a full Director expo (way beyond the scope of this article), here are a few essential facts: Director is a time-based tool in which a

short sounds that can be played from RAM) or external ("linked" files that stream from disk). If the SWA Compression and SWA Settings (DIR) Xtras are present in the Director Xtras folder, internal sounds may be converted into the .SWA format as part of the "after-burning" process. External .SWA files are linked to a movie by choosing the SWA Streaming Xtra—which also needs to be in the Xtras folder—under Other on Director's Insert menu.

For Windows users, an Xtra is available to batch convert external .WAV files to .SWA files. As of this writing, no such batch conversion tool is available for Macintosh; developers must instead buy Macromedia's SoundEdit 16 Version 2, download two SE 16 Xtras that

DRASTIC DATA COMPRESSION TECHNIQUES WILL BE THE NORM FOR DELIVERING REAL-TIME MEDIA OVER THE NET.

series of Frames make up a Movie which plays on a Stage (the part of the production that is actually seen and heard during playback). Media elements used in a movie, such as graphics and sound, are referred to as members of the movie's Cast. In general, a cast member's appearance onstage is controlled by the Score, a grid of Cells (each of which may contain a reference to a cast member) that has a horizontal time axis measured in frames. However, elements are frequently controlled as well by "scripts" written in Lingo, a relatively English-like programming language similar to those used in HyperCard, SuperCard, Oracle Media Objects and a number of other multimedia authoring tools.

Director movies become Shockwave movies by being exported from Director using the Afterburner Xtra (Xtras are Macromedia's name for plug-ins). Afterburner squeezes every available bit out of a movie to make it as small a file as possible. Once "burned," the movie filename takes the .DCR extension. Afterburner is not included with Director, but it may be downloaded free (</shockwave/devtools.html>).

Sound cast members in Director may be either internal (preferred for

are available only for Power Macs (SWA Export and SWA Settings) and manually convert each and every file to .SWA (perhaps using a macro program such as QuickKeys for processing large numbers of files). Director 5 and SoundEdit 16 are available together as part of the Multimedia Studio 2 bundle from Macromedia (about \$1,000). According to Macromedia, the forthcoming Version 2.0.4 upgrade to SoundEdit 16 is expected to include batch conversion to .SWA.

The recommended starting point for creating 16kbps .SWA files is 16-bit/22.050kHz mono PCM files; files at other sample rates such as 44.1 kHz may be batch converted using SoundEdit 16's own batch conversion tool or alternatives such as WaveConvert from Waves. Macromedia suggests band limiting the 16-bit/22.050kHz file, which is done in SoundEdit 16 by selecting the entire file, choosing Equalizer from the Effects menu, setting the bottom and top bands of the graphic to 60 Hz and 6 kHz, respectively, and pulling both bands all the way down to -20 (see Fig. 2). According to Dave Harris of Waves, Harris filters produce a better result; Harris suggests (surprise!)

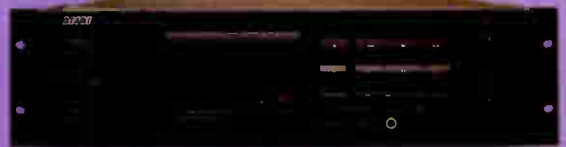
—CONTINUED ON PAGE 222

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Blurring the Lines Between

BY PETER BERGREN

The Edit And the Mix

NEW TRENDS IN AUDIO POST-PRODUCTION

This article started with an argument. I am a sound effects editor, working in both television and film. For a long time there's been an ongoing dispute between I.A.T.S.E. Locals 695 and 776 in Los Angeles about whether sound editors should be represented by 695 (which includes people who in some

way *record* sound, including re-recording mixers) or by 776, which champions picture editors. After a survey of sound editors, I.A.T.S.E. officials weighed in for 776, and a meeting was held to explain the change. It was then that the issue of exactly what a modern sound editor *does* came up.

I think the trend is that if editors don't think that they're mixers now, they'll become mixers, because they'll be mixing for the sake of their editing.
-Gary Rydstrom



Sound designers Christopher Boyes, Left, and Gary Rydstrom, Right, of Skywalker Sound.

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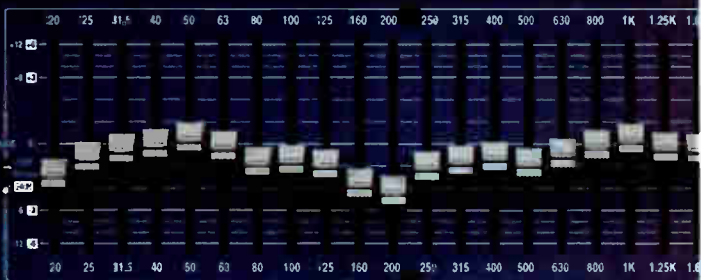
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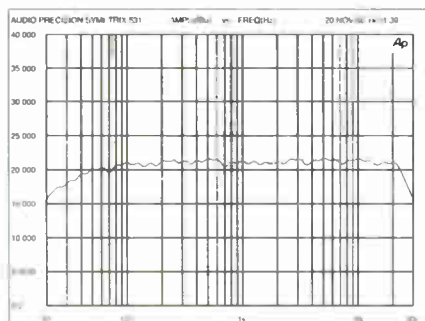
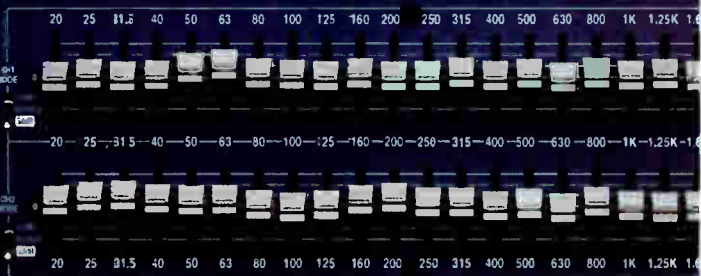
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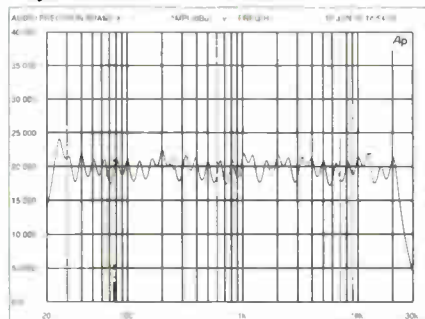
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A number of us were concerned that our work does not lend itself to simple interpretations. We don't simply "sync sound to picture," which is one definition common among those whose experience is with more traditional mag film-based methods of editing. The mechanical nature of this process doesn't allow much *but* synchronizing large numbers of potentially useful effects, which are commonly chosen without being heard all at once. In the world of mag, the mix of effects choices is usually first auditioned at the dubbing stage as part of the winnowing/mixing process of pre-dubbing.

Digital sound editing (and mixing) has changed that paradigm, however. And much of the brunt of these changes has been borne by the sound editor community. Certainly we *edit*, that is make choices, establish synchronism and provide the material that the mixers mix. But to perform our primary role, to make choices, we need to hear how one sound works with another. Digital workstations allow as many as 24 channels to be heard simultaneously, and since they also allow fades, crossfades, setting playback levels of individual files, digital EQ, time and pitch compression, and microsurgical level management, those tools are used to move the material closer to our conceptions—and make it easier to mix. Are we not, in a sense, premixing?

Mix interviewed several prominent sound supervisors/designers to get a grasp on the changes taking place. Although these professionals have special expertise in the area of sound effects, much of what they say can also be applied to dialog, ADR and Foley editing for features and television. Some of my observations are bracketed

THE PARTICIPANTS

Gary Rydstrom, Skywalker Sound, Marin County, Calif. Rydstrom is a sound designer, re-recording mixer, effects mixer and Foley mixer. He was a double Academy Award winner (Best Sound and Best Sound Effects Editing) on both *Jurassic Park* and *Terminator 2: Judgment Day*, and was sound designer and mixer on *Toy Story*, *Jumanji* and *Casper*.

Mark Mangini, Weddington Productions, North Hollywood. Mangini is a principal at Weddington whose credits as a sound editor and supervising sound editor include *Poltergeist*, *Star*



While often the people who have prepped the design process are the best to mix it, there are those mixers who are just extraordinary. It's often best to work with someone who can take your work and make it better by one whole grade point.

**—Creative Cafe owner,
Stephen Hunter Flick**

Trek—The Motion Picture, *Star Trek IV: The Motion Picture*, *Star Trek V: The Final Frontier*, *Raiders of the Lost Ark* and the Disney favorites *Aladdin*, *Beauty and the Beast* and *The Lion King*.

Stephen Hunter Flick, Creative Cafe, Los Angeles. Flick won Academy Awards for Best Sound Effects Editing on both *Speed* and *RoboCop*. His credit list also includes *Twister*, *Die Hard*, *Apollo 13* and *48 Hours*. With his wife, Judee, he recently formed Creative Cafe, where future projects include *Starship Troopers*.

Ron Bochar, C-5, New York City. Bochar is one of five principals at C-5, New York's premier sound editorial house. His credits as a sound supervisor include *The Pelican Brief*, *Philadelphia*, *The Indian in the Cupboard* and *Presumed Innocent*.

ARE SOUND EDITORS MIXING?

In your credits, you're listed as sound designer and mixer of effects on many major feature films. Why don't you have someone else mix the effects you've designed?

Gary Rydstrom: I feel pretty lucky that I get to pre-mix and mix the sounds I create. I think it's a very efficient way of working because I know the material, and I know what the intent was. And it's nice to be able to keep that control throughout all the stages of editorial, including certain editorial steps where I like to be able to edit and mix as part of the same process.

Are you making EQ and effects decisions while you're mixing, or do you save that for the final dub?

Rydstrom: I work in a room where we have a mag recorder and a full LCR surround monitor system. I'm trying to do everything—panning, EQ, echo, those sorts of things. You need a room you can trust to do that. On the other hand, if you couple a digital workstation with a fairly decent speaker setup, that might not be a full-blown mix room setup, but it might be good enough to do basic balancing of effects against each other, though not panning and EQ. So there is going to be this new, in-between kind of premixing, where you won't make all the decisions you would in a big dubbing stage, but you will make choices and balances, and then you could fine-tune that in the bigger room.

So you think premixing will become a regular part of an editor's job?

Rydstrom: I think the trend is that if editors don't think that they're mixers now, they'll *become* mixers, because they'll be mixing for the sake of their editing. You can make more choices than you were able to before, when hundreds of tracks would go to the mix stage and the editor and the mixer would be left to sort out a lot of material. Editors should use the digital workstation to make as many choices as they can, as early as they can, and then listen to those elements at the level that they think they're going to play. That's a major advantage of digital editing: You can hear so many things at once, and you can hear them in proper perspective.

Maybe the way to look at it is you're doing a "virtual mix" first, keeping elements separate (but adjusting record or playback levels) and monitoring them through unity faders. Then that "mix" goes to the dubbing stage, where the fine points are adjusted.

Do you think there is a blurring of the roles played by sound editors and mixers?

Mark Mangini: Well, there's certainly more so than 15 years ago, but I think the boundaries are pretty distinct. I still perform a traditional sound supervisor role, which is that I edit the tracks, or create them, and bring them to a re-recording mixer, and he or she does the mixing. That relationship has remained relatively stable for the 20 years I've been doing this. Now, because I'm working on digital workstations, the work that I bring to the dubbing stage has a higher degree of preparedness; I am effecting the levels of the material within the workstation, so that there is

less work to do by the re-recording mixer, or that work has been pre-thought out and makes their work easier. To that end, we're creating balances within our workstations to more closely approximate what we think it should sound like. We're less likely to make equalization decisions, because we cannot hear

ization] decisions.

Are you "marrying" [mixing] elements together?

Mangini: I guess in that regard we are doing a certain amount of mixing. In the Pro Tools workstations we use here, you can decide, "I want this effect to sound like this forever, because that's my aesthetic." In Pro Tools, you

We're absolutely going to see
sound and picture edited together.

And technology will solve the problem
of keeping up with each other.

—Mark Mangini,

Co-president of Weddington Productions



an approximation of a theater environment in the 2-channel environment we're used to working with. Here at Weddington, we do have tuned mix rooms that double as edit rooms, and in those rooms we do make those [equal-

can do a bounce, for example, where you designate a group of tracks and combine them down to a lesser number of tracks, which creates a new file on the hard disk. Philosophically speaking, an editor has to decide

whether to provide the mixer with the elements that created the bounce, so that mixer has the option to mix them as he or she feels appropriate. Or an editor may feel, "This is what's going to work, and I'm not going to provide the elements."

Does this represent a new attitude among effects editors?

Mangini: Yes, and I support that, because I try to hire people who have a creative vision of what they want to do. Part of the way I work is that I give editors a large palette of sounds with instructions—some general, some specific—about how I want that scene or special effect to sound, and then I give them a lot of latitude about the way they combine sounds to achieve that result. A good editor will know when to mix elements and when to give me the option to unwind something. And often we give the mixer multiple elements that if played back at unity gain will sound like the mix the editor intended, but still allow changes on the stage.

Steve Flick: I think we'll find more people are setting levels in digital editing systems that almost mix themselves, and the way they do their channel assigns, LCR will allow them to give us presorted sound images for a mixed field. My expectation is that new automated mixing consoles, such as the Yamaha O2R, and the new Pro Tools mixing environment will allow us to deliver sounds that are pre-dubbed, or need less shaping in the predub situation. Most predubs are still done on the stage, but using Pro Tools it's possible to use "volume graphing" and set volume relationships between individual sounds (as many as 24 or 36 channels), so that when they are strung off in groups to 24-track or DA-88 or 6-track, they have already been assigned volume relationships, as opposed to raw sound effects, which have not. By being able to work with such pre-designed sequences, the mixer can spend more time on truly difficult problem-solving, which is to do the final mix, where level relationships are set between music, sound effects and dialog. The purpose of film sound editing is to prepare for the mix, and the purpose of the mix is to bind it all into a seamless dramatic experience.

Do you think that the traditional separation between sound mixers and editors will be maintained?

Flick: For the most part, yes, because people have a tendency to want to do one job, or people who hire people have a tendency to hire specialists and assemble a group of specialists. While

often the people who have prepped the design process are the best to mix it, there are those mixers who are just extraordinary. It's often best to work with someone who can take your work and make it better by one whole grade point, and make it have dramatic wholeness.

Ron Bochar: From the sound editor's perspective it's a good idea to try to control your own material. We've been working on it for months with the director prior to the mix, and we've been the ones hired to come up with those sounds. To me, mixing it too is very healthy. It's sort of the Gary Rydstrom school: "I cut the stuff, I'll mix it." And

the mixers that I've worked with who have let me be part of the process at the board at the predub, and even at the final, have benefited, too. They're not worried about whether they can hear the footsteps I've cut running across the screen; they're worried about the dialog. But I've made sure we can still hear those footsteps as we work on the dialog in a certain area. That kind of collaboration makes the projects that much more exciting. It only makes sense that we'd all be sitting behind the console with an EDL of the same stuff we've been cutting, but combining it, and making it sound the way it should.

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Mangini: Mixers are not a dying breed. When you have the time and money, I enjoy the luxury of the interaction with a new human being. I like the new input, and the new ideas. And although I've mixed my own effects on several films, I'm not as technically proficient a re-recording mixer as I should be, which takes away from the creative aspects of the mix. I think there can be great relationships between sound editors and mixers, because each respects the other's expertise.

SHORT SCHEDULES, NEW TECHNOLOGIES

[The past few years have seen post schedules on both television and feature films shrink dramatically. This is due in part to accelerating costs, including interest on the money borrowed to fund a project. Imagine how much \$60 million costs to finance, and how motivated producers are to get their product released to the market, to see cash flow in rather than out. In television, the challenge is to somehow maintain the pace necessary to meet the broadcast deadlines, yet keep production values high. This includes sound, which is likely to become a competitive factor as digital means of distribution increase sound quality for the viewer. Nonlinear, digital technology has been the tool of choice to meet these time and quality pressures. But the flexibility it allows comes with certain costs.]

Mangini: In picture editing, what seems to be happening is that more and more versions of a cut are being generated, which means that they're working later and later and making more last-minute changes, and it's driving everybody crazy.

What drives everybody crazy is the need to conform [match] all sound elements to every change in picture. Consequently, editors not only edit but re-edit, sometimes more than once, usually with the pressure of a dub looming over them. This tends to increase the number of people editing, and crowds their efforts into a fore-shortened period.

We're absolutely going to see sound and picture edited together. And technology will solve the problem of keeping up with each other. Avid is just about to release Change List, which allows a Media Composer to talk directly with AudioVision software, and on a moment-by-moment basis communicate exactly how the picture has changed. It downloads its EDL and prompts you to make creative decisions about how to

conform sound to the evolving picture cut. So sound and picture editors will be able to keep informed about what the other is doing.

Rydstrom: You don't want it so that each creative person on the crew is doing less and less a percentage of the film. You want people to be able to follow through so that you have as unified a style of soundtrack as possible. You can't achieve that when all of us have been forced to do the kind of sound jobs where there are so many people working over a short period of time, with one person doing the car-bys in reel 3 or the Foley in reel 4. Under such circumstances, it's very hard to pull that together into a unified whole.

An obvious answer to this dilemma is to cut sound and picture *simultaneously*: The technology to ease the task of coordination between picture and sound teams is just now appearing.

As conforming gets easier, which was always a problem initially, I think that the way that sound should be done is to start almost as soon as the picture department starts. Then you could build sound and picture together so that by the time the picture is locked, with a little bit of time to finesse it and finish the job, we should be able to get into mixing sooner than we used to. Which should make the producers happy, and make a better film as well. The old-fashioned way of waiting for the picture to start the sound seems to be inefficient, and the picture editing doesn't take full advantage of the sound possibilities. With digital picture and sound editing, the more that they can talk, the more that simple things—like the A and B dialog tracks that the picture department is cutting—should be the final tracks. The rest of the sound crew can be working with their tracks, and then sending the picture editors sound effects and Foley tracks as they finish.

[Developments like Change List imply the advent of a less linear, segmented work process, with much more feedback between picture and sound departments (and the director). Parallel sound and picture editing will be an important element in gaining back creative time, and in producing soundtracks that have a cohesive dramatic vision. The odds favoring this are further increased by better communication between editors and clients.]

Do you have a means of playing multiple elements in mixed form as a preview for clients?

Flick: I have a 30-channel system in-

stalled in what's basically a small mix room, where I can play three DA-88s and the Pro Tools with digital picture so you don't have to wait for the tape to roll down. Most of the time, clients are focused on so many things at the end of a project that they don't have much time to spend with you, and you want it to be fruitful and direct. So the new technology allows better client interface.

Bochar: The new room is based around an Avid AudioVision as its centerpiece. [At C-5, a 6-channel discrete mix room has just come online, with a 14-foot screen and tuned monitor system for premixing material in concert with larger dub stages.] All the picture comes from the Avid, as well as 16 channels of sound. We're trying out Akai DR-8s as the recording medium. If everything works as it should, there's technically no sprockets, no tape. And it's instant access; you can set up the AudioVision in a loop and work on a particular section until it's right. The automation on the Otari Status board picks up where it's supposed to. You just hit Record when you're ready and lay it down, then move on to the next section. The idea is that a dialog pre-mix gets done somewhere else, maybe by the mixer who's going to be doing the finals. And as they finish a reel, we get a layoff of their predub and monitor that while we mix effects and Foley here. So when we show up a day before the final, you can either do a run-through of the whole movie, or you can start the final.



THE (NEAR) FUTURE

Sound editing is undergoing the same kind of changes that many other skilled disciplines are; it's becoming less segmented and linear, its role more interactive than isolated. Partly, this is because of the evolving digital editing tool set, and partly because filmmaking is at heart a collegial activity. It's not surprising that sound editors would want to pre-mix the sounds they've chosen, for they wouldn't choose them without some conception of the "orchestration" intended. And as long as that mix can be altered later if needed for the benefit of the final dub, the creative and economic benefits are likely to be substantial. ■

Pete Bergren is an Emmy-winning sound editor and mixer at Todd-AO in Hollywood.

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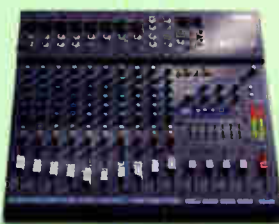


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SOUND FOR FILM

TRACK LAYOUTS

PAST, PRESENT,
FUTURE

by Larry Blake

The maxim "Work expands to fill the time allotted" can be paraphrased in any number of ways in the world of post-production sound. "Dub schedule expands to fill the time allotted" and "Turnover of locked picture will be delayed to exceed the original time allotted for the sound edit period" are but a few possible permutations. The closest version for the purposes of this month's

with premixing used only in the event of an extremely busy sequence. But for the most part, all dialog, music and sound effects for each 10-minute reel had to fit on 16 channels to be mixed down onto a composite 35mm optical negative. (Which meant that not only could you not punch in on a mix, you couldn't even *hear* it until the next day!)

The coming of stereo in the '50s increased the number of total inputs, although the total number of mag units did not increase greatly. The Westrex consoles used at Fox, MGM and Todd-AO for 6-track 70mm mixing all had approximately 20 faders that could control up to a 6-track piece of

small boards.

This seems inconceivable now, with today's style of mixing deriving from directors and producers demanding more and more choices, along with the ability to change their minds later. Crews were able to get away with so few inputs in the past by careful planning that involved knowing exactly which units would be tied together during premixing and even which premixes would be combined prior to the final mix. They also, as a rule, had much more time, with the same mixers working on the whole film from start to finish.

Today it's not uncommon to have three stages running simultaneously, juggling var-



ILLUSTRATION: TIM GLEASON

column is "Tracks expand to fill the board you will be mixing on."

In the first 25 years of film sound, with mono mixes being used almost exclusively, I don't believe that many re-recording consoles in the world had more than 16 inputs. Before 1950, all mixing was from and to optical tracks (discs were used for Vitaphone and for certain music applications),

mag and, as a result, 120 tracks at the final mix. The size of consoles only started to change in the early '80s, a good five years after Dolby Stereo was introduced. Before that, it was still common to find consoles with 32 or fewer single-input channels in many of the top dubbing stages; *Apocalypse Now*, the Star Wars films, two of the three Indiana Jones films—all of these were mixed on

various combinations of premixing, finals and print mastering. One recent film took the concept of options to an almost obscene extreme: Each reel was finalized in two studios at the facility, with each recording both SR mag and digital stems. During the print master, the mixers had to choose between not only which stage's mix would be used, but whether they

—CONTINUED ON PAGE 95

FACILITY SPOTLIGHT

MEDIA ENGINEERING AT APC STUDIOS

by Rick Clark

Atlanta is not your typical easygoing Southern city. It's a world-class boom town that's been home for the Olympics, a multiple World Series-winning baseball team, major corporations like UPS and Delta Airlines, CNN and all of Ted Turner's (now Time Warner's) myriad cable channels. Atlanta is also a major cultural center for the arts and a destination for movie companies and recording stars.

—CONTINUED ON PAGE 106



Clockwise from above: Chris Downs, production manager, on the board; client gallery/producer's desk; Salvatore Nappo, president, in APC stage; audio suite control room

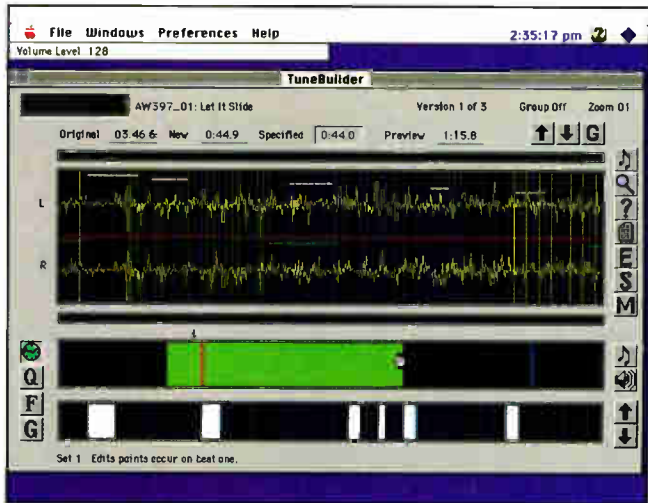
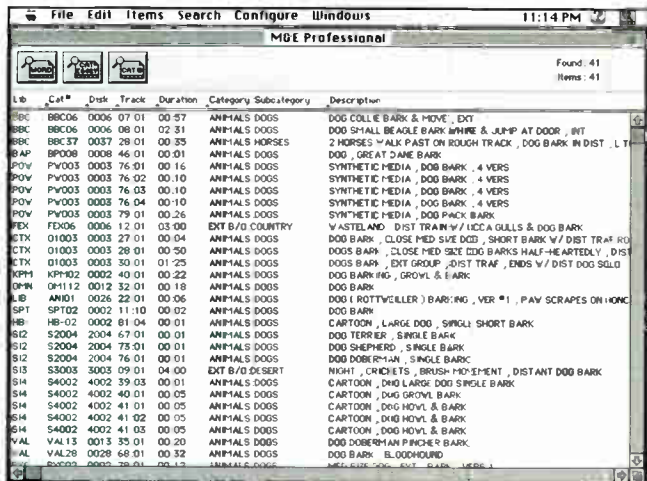
PHOTOS: RANDALL WILKINSON

SOUND LIBRARY MANAGEMENT

by Rick Clark

Creating and acquiring new sounds for a library is arguably the major lifeblood for any successful audio/

video post-production house. Thousands of sound effects and commercial music tracks on hand present seemingly endless cre-



Above: TuneBuilder from Airworks
At left: Gefen M&E Professional search for dogs

ative options; however, the ordering and maintenance of those expanded collections can bring almost as many logistical headaches.

As a result, it has become a major thrust within the post industry to figure out ways to streamline the storage and

—CONTINUED ON PAGE 106

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—FROM PAGE 92, TRACK LAYOUTS

would use the analog or digital version!

It's pretty clear that what used to be the shifting of mountains of mag film—cut units, premixes, final mixes and print masters—is becoming more and more an issue of track management with multitracks, MDMs and workstations, although the latter are just beginning to be used for actual mixing. The next level of management will be space conservation when recording to non-linear media, although one would like to think that this will have already been dealt with by the system software.

The bottom line is this: You should always cut (see next month's column for more about this) and pre-mix your tracks with a clear understanding of the mixing console and facility. You not only avoid painting yourself into corners, you can best make use of the advantages a facility has to offer. I have trouble starting a mix if I don't know which faders everything will show up on at the final mix and how the stems will be bused. I have done many stereo mixes on a 32-input console, bringing in a 16-input sidecar for finals. Having since done films (which weren't any more complicated) with 60- and 72-input consoles, I wonder how I was able to make the smaller board work. Simple planning.

Track layout has been a fetish of mine since I began mixing in 1988. The majority of my work as a supervising sound editor and re-recording mixer has been in multitrack-based environments, spitting off to mag only at the last moment, usually as a copy from a multitrack master. The benefits of multitracks in post-production are legion: material cost, speed of mixing (hotly debated by some, but not by me) and reel changeover (not debatable), and, referenced to this column, track layout flexibility. I find that mixing to mag, while it has a few precious advantages (primarily with regard to the simplicity with which material can be conformed to picture changes), severely cramps one's ability to be creative with laying material out. For example, most mag-based studios run three recorders during finals for stereo dialog, music and sound effects stems.

What if you want to separate group walla out from effects (because some English words poke through that would invalidate its use in M&Es) and from the dialog stem, because indeed most of it is of a general nature and can be used for foreigners? The answer on a recent film was to simply do a 5-track



(LCR, LS, RS) group stem separately. On another film it saved time to have a separate 5-track music stem for live music recordings, plus another for underscore and source music. Since the live music was mixed directly from the multitrack masters, any small overlap would have been a big problem in doing fixes, and working on multitrack provided the space to easily split out and "checkerboard" the music.

For this same reason, in recent years I have been recording my main center-track dialog stem as a pair of tracks. By checkerboarding dialog premixes, virtually every angle jumps from track to track, saving me from a multitude of

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sins. Matching EQ in complex dialog/ADR scenes allows either two actors to be recorded separately (in the case where everything is looped), or for production and ADR to be separated. Conforming picture changes in multitrack-to-multitrack mixing is also a snap, with the ability to separately punch-in on both sides of the transition. The argument against this (and it's solid, I might add) is that by having only one main center-track dialog stem, you avoid the possibility years down the road of someone not transferring one side. To this I can only say be clear in your paperwork; I think the advantages far outweigh the risks.

Keeping production sound effects (PFX) split off onto their own stem has been a big help to me when making foreign music and effects (M&E) mixes. If PFX are in mono, I'll just record a single-track stem, but if there is a lot of stereo material, I will combine them with Foley footsteps on an LCR stem. I think it's important to keep Foley separate during finals. Although it might seem obvious to just bus Foley and PFX to the effects stem, they have such a close relationship to the dialog track, and sometimes a balance that will work for a domestic mix will differ with foreigners.

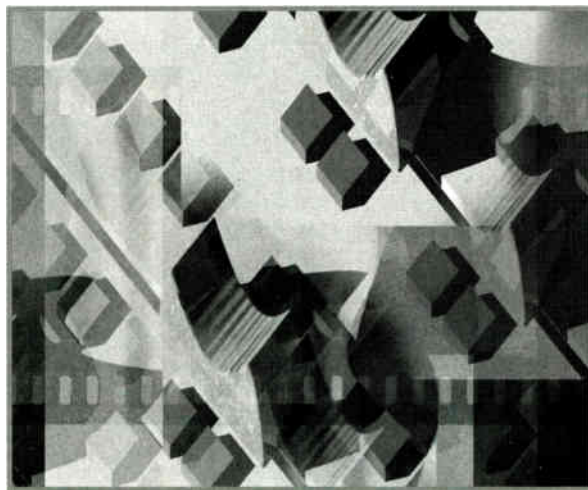
When making the composite M&E, I'll always record on three separate LCR tracks (by double-busing) what I'm adding to the music and effects stems. This "foreign sweetener" stem will include insertions of the dialog stem or the Foley cloth track, not to mention separate cut effects. On a recent film, it even included a separate minus-vocal music performance that was done to playback to match what is used in the domestic mix during an English-language poetry reading.

The overall layout of stems should always take into consideration the bus-ing structure of the console, the most obvious example being boards that don't have three-track panners. In these instances, you should bus left/right and left-surround/right-surround channels in odd/even adjacent channels. This has the advantage (especially when you have a meter bridge) of allowing you to eyeball channel balance.

As much as I spread out stems, I always stop at 22 tracks to allow the material to be X-copied to 2-inch, 24-track SR. (I'm usually recording my stems

and print masters on 48-track DASH machines.) I do this because the major studios have virtually agreed on 2-inch SR as their format of choice for archiving master recordings. Warner Bros., Walt Disney Pictures and Universal Studios are all using 2-inch (some in conjunction with digital multitrack) to make protection copies of masters that are almost exclusively on mag film.

Some of the most bizarre tracks assignments I've ever done were for temp dubs, where you have to work fast and cheap. It's wise to stay within the magic number of eight tracks (working on multitracks or MDMs) because you can then do string-offs to MDMs (to get the mix back to the picture department) or back to workstations (to be conformed) with a minimal number of passes per reel.



One of the more common layouts I use for temps is to have one track for primary dialog (what would be considered the "A" track in the picture department) and a second for ADR/narration, or overlapping dialog that the picture department had to split off to a second (B) track. As noted earlier, for final mixes, this gets me out of a lot of trouble when conforming mixes, because if everything is tied together, there is more material to unwind.

The other tracks I usually ration as an LR music and LCR effects stem, with hard effects kept in the center and BGs in the LR sides; again, this will ease the grief in updating this mix by allowing you to conform continuous BGs and hard-sync effects separately. If it's a busy effects show, then it's not uncommon to carry another MDM (or 6-track film) and have LCR FX and LCR backgrounds.

When recording temp stems on ana-

log 24-track, you would do well to end up with 7-track stems to fit into the 22 usable tracks. It's always smart in those types of situations to use different rolls for odd- and even-numbered reels to allow transfers to happen as soon as you're finished with a reel.

One issue with regard to temps dubs that can affect the track layout is the format on which it will eventually be projected. While matrixed Dolby A-encoded 2-track Lt-Rts have long been standard, non-NR-encoded 3-track discrete LCR temps have been all the rage recently. The idea appears simple: By not having to matrix-encode stems, there is virtually no need to do the print master on the dub stage in the traditional manner. Doing the eight-to-three combine in the transfer not only saves money, but also time, which is always

in short supply in temps. This is the basic POV of post supervisors and some mixers, who often toe the party line of discrete=good=wide, matrixed=bad=narrow. But the real world beyond the audio post facility should also be taken into consideration.

First of all, a Dolby A-encoded Lt-Rt is by far the easiest format to deal with either in professional screening rooms or when going to the boonies for a preview. Regardless of the cinema processor (Genuine Dolby or other), you know there will be two channels of A-Type available.

You can't say that about SR, and if you want to noise reduction-encode a 3-track LCR temp print master, you will probably have to bring three SR channels yourself and do some sort of bizarre patching in the back of the rack, if not bring in a whole 'nother cinema processor.

There are also practical sound issues. Assuming 6- (if mixing to mag), 7- or 8-track stems, you will only have room for an LR music stem. What do you do if you want to make a perspective change from stereo underscore to center-speaker mono cheesy source from a radio? With LCR discrete playback, this can't be done: It will just get cheesy and will still be on far left and right—and dramatically wrong.

Also, the way the matrix brings out-of-phase music and effects to the surrounds is nice, preventing you from having to deal with surrounds in the mix, while still getting their benefit. Because the 4:2:4 matrix spackles the



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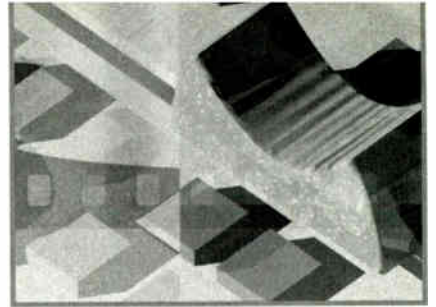
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stereo image across the three speakers, there is overall less need to worry about channel balance issues for temps. Matrixed playback also allows you to send some signal to the subwoofers in case the main system lacks *cajones*. I find the cost savings to be insignificant compared to the down-the-road advantages of using matrixed print masters for temps.

It's impossible to stay within eight stem tracks for a temp if you're making a full-blown 5.1-channel mix, something that I'm shocked to report is becoming more common. When is something that's good for the final mix of a film not good for a temp? The answer, Grasshopper, is when something costs money that's not being spent on the real movie, money that post supervisors will insist "they don't have." It's not uncommon in recent years for 6-track temps to take three or more weeks, and even if you do have all the money you need, it's such an irretrievable waste of energy and time, which will always affect the final result.

I have a second, more philosophical argument against 6-track temps: Just as filmmakers seem to want to make their movies seem big, important, even *good* by hyping the soundtrack to ear-splitting levels, so is making a huge deal at the temps similarly misguided. There's a solid argument for keeping temp clubs simple because you're looking for the preview audience's reaction to the story—what is working and what isn't. For *those* purposes, a standard 2-track print master will give you enough creative latitude with the soundtrack to prop up the weakest parts of any film as much as can be had by sound.

Next month, I'll address issues of track layout as they pertain to sound editing. Send some of your more creative track layouts to P.O. Box 24609, New Orleans, LA 70184, fax (504) 488-5139, or e-mail: swelltone@aol.com. ■

Larry Blake is a sound editor/recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be the biscotti de regina cookies at Angelo Brocato's.

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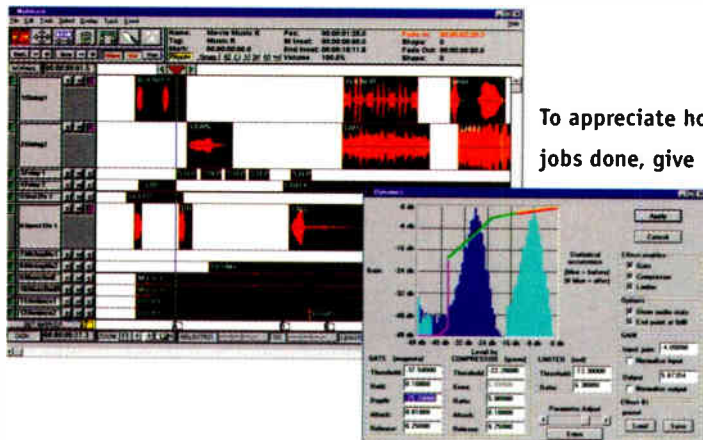
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—FROM PAGE 93, SOUND LIBRARIES

access of large collections of sonic information.

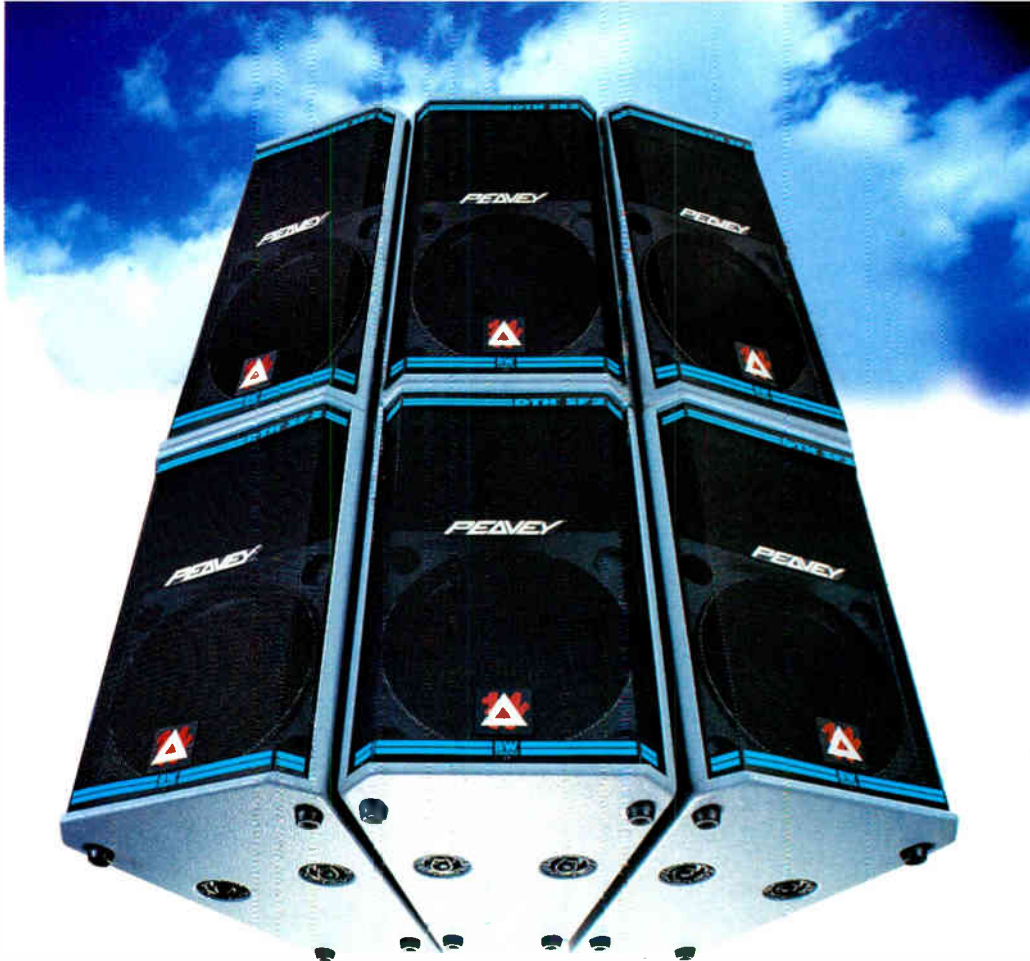
Anyone who has been in the audio post field for more than ten years remembers (without fondness) the hassles of tape media storage and searching for specific sounds or tracks before the arrival of compact disc. "When we started out 15 years ago, we were using sound effect and music libraries on record. Thankfully, we were able to leave all of the cracks and pops and problems of the medium behind when we went to compact disc," recalls Jim Reyland, president of Nashville-based Audio Productions Incorporated. "The fact that you could store a lot more CDs in a smaller space than you can records was important. Track accessibility was another plus."

Nevertheless, CDs didn't make location and retrieval of sounds from large libraries any easier. Many larger production facilities employ a full-time librarian, whose function is to hunt down requested sounds or tracks for those producing a project. Though helpful, it uses up time.

As a result, a number of companies, like Gefen Systems and Airworks, have developed relationships with many of the commercial sound effects and music library companies, to create software that enables audio post facilities to centralize track information from many libraries through a single database and (in some cases) provide a way to obtain, play and alter the information that has been pulled.

Gefen (www.gefen.com) markets two powerful data search engines: M&E Professional (for Macintosh) and M&E Windows. "When we started, CDs were just beginning to exist as libraries. People kept all of their information on reel-to-reel or mag, or cassette tape libraries," says Hagai Gefen, who founded Gefen Systems in 1987. "If you needed to find out what was on the reel, you had to open the case and grab the piece of paper from the reel, and then read what was in it. With CDs, you went to the track that you wanted, dialed it up and there it was. It was also a media that you couldn't erase, so it was a very safe media to keep your sounds on.

"We really saw the growth in what we had created when CDs became abundant," he continues. "For audio post facilities, that really justified purchasing a computer and a program and investing into something that allowed you to quickly locate what you were



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looking for."

Reyland believes that the centralization of sound effects and music information through software has substantially assisted his company's efficiency.

"Clients may get a little frightened when they see over 5,000 CDs, because there are so many sounds available to them," Reyland says. "You can see the client's eyes light up when they realize what the computer allows them to accomplish. The software digests all of those sounds and information and, in a real quick useful form, allows the user to punch-in, for instance, 'marching band' and find out that there are 62 marching bands in there, and know exactly where they are. It is really easy to go find them, and it saves them a lot of time. It also saves us a lot of time in pre-production, and that is one of the biggest pluses."

"By having all of the CDs in a closed-in environment, they can be accessed by anyone, anywhere in the facility, all the time," adds John Ross, president of Digital Sound & Picture in Los Angeles. "In the past, people would actually have to have the CD in their hands. That is no longer the case. Now, the CDs last longer and don't tend to get lost, as would have been the case at one time.

"We have two 300-CD jukebox systems that have a computer directly hooked up to them," elaborates Ross. "That computer, in turn, is hanging on the local area network. Each edit bay and dub stage uses Timbuck II Pro to access that computer, so they can do their searches locally and then basically control the computer when they wish to access the physical sound files themselves. That computer will unload the disc and play it back through an AES/EBU network that is essentially distributed throughout the facility. Whoever interrogates the system gets the sounds back via an AES/EBU link."

One exciting development offered by Airworks (www.airworks.com) concerns its software application TuneBuilder, which, in conjunction with TuneFinder, allows the user to not only call up music by library, category, keyword, instrumentation, tempo and/or version, but also to audition and automatically edit any number of musical segments instantly.

"Essentially, TuneBuilder is an automatic editor," states Airworks senior vice president and chief operating officer Griffith McCree. "We have encoded music tracks (found in many commercial music libraries) with markers that will allow for a large number and variety of edits for that music. Therefore, when

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one makes use of that application, one is capable of immediately and automatically editing music. TuneBuilder is not only automatically editing, but these editing decisions are musically based, so it is providing you with flawless music versions in the edited form.

“We have a staff of some 15 editors who work each of these tracks (found in the commercial libraries), and the decisions are musically based, acoustically evaluated and visually examined in waveform editing,” he adds. “It is a combination of those three things that provides optimized edits. That process is then taken off to a set of checks and balances, which determine that those edits are all valid and with the same set of standards, and checked by other people. It is a team-checked process.

“You can call up a track and tell it that you want a 27-second piece, and it goes off and does that for you. You can sit there and audition each of the five versions. If you want a 27-second, a 31-second and a 26 and a 42, you can go in there and generate each of those, too. What this really gives you is speed. We have kind of done the work ahead, and the software automatically generates these things, already edited, for you. It is literally as simple as that.”

Like Gefen, Airworks' software interfaces with most popular libraries on the market, like ABACO, Arpeggio, Atmosphere, BMG, Chronic, Energetic, Fresh, Josef Weinberger, Killer Tracks, The Music Bakery, NJJ, Signature and Valentino.

As computers and software continue to push the evolution of the audio post process, Gefen is seeing increased requests for integrating extensive sound files into large, easy-access central servers.

“The thing that people are asking for now is the ability to recall the sound files from a central server. That is basically where we are going,” Gefen points out. “The problem is that the prices of the hard disks, while they are falling, are still very high.

“Eventually, people will have to invest in the infrastructure to connect all of the workstations together through a central location that will allow you to transfer sound in real time, from station to station. That is what everybody is shooting for,” concludes Gefen. “I think that we are close to coming up with a reasonably priced system now. A couple of years from now, it will be very affordable. If you can access your sound instantaneously, you are going to please a lot of people.” ■

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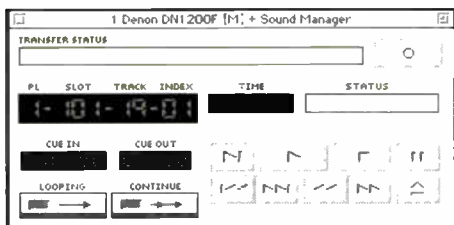
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—FROM PAGE 93, APC STUDIOS

It's that air of possibility that has encouraged the emergence of forward-thinking, creative individuals and production companies, whose cutting-edge work has helped enhance the area's image. This has created a cycle that has lured further big-business activity, which, in turn, has brought more lucrative contracts to those very production houses.

APC Studios, which stands for Atlanta Post & Creative, has earned a reputation as an award-winning audio/video/animation production house. Its client base includes practically every major record label, as well as an impressive list of Fortune 100 companies, including American Express, Coca-Cola, IBM, Reebok, Siemens, HBO Sports and Lorimar Films.

"We initially got into developing the business and our client base with a focus on audio for film," states APC executive vice president/chief operating officer Laurie Nappo, who co-founded the operation in 1987 with husband Salvatore, the facility's president. "Our clients started demanding more and more services from the same house, so we thought that we wanted to be at the head of the curve, instead of just reacting to it. The side of the organization that I manage is making sure that we execute on Sal's vision and strategy. He is always thinking, 'What do we do ten years from now, and how do we meet that demand that we see growing?' We were one of the first three places in Atlanta to put in nonlinear digital audio."

Because audio and visual elements are becoming increasingly interdependent, the Nappo philosophy is that engineers and designers need to be fluent in both. "You could have someone who is a great audio engineer, but if they don't know how to turn on an Avid machine and move around files, then they are of no use to us," Salvatore Nappo says. "Everything is so software-driven these days."

"We don't hire audio engineers. We hire media engineers," Laurie Nappo adds. "They need to have a specialty, but they need to have a broad enough perspective to go into these other areas where we have development and say, 'Yeah, I understand that.' If you only understand audio, you are not going to be able to embrace how it applies to film or video or animation."

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recording studio.

"The control room, which contains custom-designed, wall-mounted Steve Hartman mains and discrete surround speakers, is relatively large and deeper than many, and it has a 14-foot clear ceiling, so it has a lot of vertical height as well," Salvatore Nappo points out. "Bob Hodas does our room tuning, and I am really pleased with him. He comes out with a really good, smooth, across-the-board sound. There are a lot of mix rooms that have that heavy midrange element, but I prefer a more accurate environment."

The console, used primarily for tracking and chosen for its versatility and clean signal path, is an early CAD prototype that Salvatore Nappo put in eight years ago and has updated to a 48-in, 8-bus configuration. (Nappo says the facility is looking to upgrade in the next few months, "to either an SSL or a Euphonix.") An 8-channel Pro Tools system, with Sound Designer II and "all the Waves plug-ins," handles most editing chores. And a Drawmer 1960 compressor is used regularly, especially on the live radio dates. The facility also has 24 tracks of ADATs, and the preferred mic on guitar and for stereo overheads is the AKG 414, with a Neumann U89 for studio vocal dates.

One of APC's most enjoyable ongoing audio undertakings concerns the production of the 99X LiveX studio concert series for Atlanta-based modern rock station WNNX-FM. Contemporary artists including Jeff Buckley, Fleming & John, Tracy Chapman, Dave Matthews Band, Melissa Etheridge, Paul Westerberg, Bush, Matthew Sweet, Suzanne Vega, Wallflowers and a host of others have graced APC's tracking space.

"When I listen to 99X, it seems like every third song is someone who has come through our doors," says APC production manager Chris Downs. "It is nice to be that in touch with the scene."

The events, which are usually captured on 24-track Otari analog (and also laid straight to DAT, though about two out of three shows get remixed before airing), have generated increasing visibility for the studio with national and regional acts.

"We get to see some killer acts come through the studio," Salvatore Nappo remarks. "The fans will sometimes come over two hours before the show and wait outside so they can get in the front row. The energy level is incredible, and when you take the fans of a particular artist and put them right there in front, there is a synergy that begins to



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happen. We try, in the recording process, not to obstruct that chemistry in any way."

"There are reasons why I think things work so well here," Downs elaborates. "We have a 2,000-square-foot stage, which is plenty of room for the bands and fans. We also have one of the largest control rooms in Atlanta—spacious enough to comfortably work and seat the record label people and 99X reps who come to the shows. It is a vibe-y environment that is conducive for these kinds of settings."

Besides capturing live sparks for LiveX, APC also develops artists for its own indie label, Isabella Records. Two

of the artists on the roster are Salem Ash and Downs, whose smart acoustic alternative debut, *Other*, was just released. APC also has a multicultural children's label called Itsy B. Bop that has enjoyed several forays into the marketplace.

"The thing that I enjoy about the small-label mentality is that there is still artist development involved," says Salvatore Nappo. "There isn't a whole lot of artist development at the major labels at this time. You need to be an established act and have a few CDs, or a CD that is moving some pieces, and that is when you get looked at. This has actually been a very enjoyable phase of the whole music picture here at APC."

"Everybody here at the facility is a musician, including the animators and the editors that are working on the picture side of things. Music is a big part of everybody's life here. If we like a band, we try and help them out, whether it is to get them a disc produced at a cost-effective rate or any other type of arrangement."

On other audio-related fronts, APC has done considerable work for corporate, radio, film and television clients, ranging from basic commercial work to full surround sound mixing and work for 70mm shows.

"The cool thing about the 70-millimeter shows is that they are discrete channel playback," states Salvatore Nappo. "There you really have total control over placement, imaging and the whole ball of wax. We have done four 70-millimeter shows that way. Three of them have been for simulator thrill rides. It is a lot of fun because there are a lot of sound effects and action. The music editing also really has to be very tight. On one of them, we composed the entire musical score."

"When we get a production, whether it is television, radio or live events, every piece of the production is equally important," he adds. "You will find visual video houses where audio is the last thing on their minds. To me, it is as important, if not more important, than the video. That is what sells it. The sound effects, the audio, the music create the environment to display what you are seeing visually."

Even though APC is a fully outfitted facility, in terms of gear, the Nappos and any of its employees feel that it's the hands-on touch and range of creative input that keep clients coming back.

"We have about a 99 percent client retention," Laurie Nappo concludes. "We haven't lost a client in years. We have the Fortune 100 as our client base, and every major record label, from California to New York, is a client of APC's. Truly, we have very high expectations, because we are a little bit boutique-ish, but we don't have that esoteric attitude on what we deliver. We are really old-fashioned. Give a promise when you mean it. Back it up and deliver it on time. Don't over-commit, and do what you can do, but by God, do everything that you can. Our tag line says, 'We do stuff.' Our second corporate line is 'Do whatever it takes.' It is truly that way." ■

Rick Clark is a contributing editor to Mix.

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❑ The RP220 Dual Tube Mic Preamp is the most popular tube mic preamp in the world. It's warm, pristine characteristics make vocals pop to the front of a mix, thicken up acoustic guitars, and more. All for only \$500 retail.

❑ The RP282 Dual Tube Compressor/Limiter also adds warmth and softness to any program material, while adding just the right amount of compression. It's got all the right features like side chaining, stereo linking, and input/output/gain reduction metering. The price, only \$600 retail.

❑ The MP110 DIRECT DRIVE is a little single channel tube mic preamp. It has a high quality input transformer, variable gain and output level controls, +48 volt phantom power, 20 dB input pad, and phase reverse. It also has a little price - \$230 retail.

❑ For impedance matching, recording direct, running an instrument direct to a mixing board, or for warming up a digital mix, we recommend the ADB3 Stereo Active Direct Box. It has two channels, each with a ground lift, +/-20 dB of gain, 100 dB pad, and transformer coupled XLR outputs. Only \$200 retail.

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NEW AUDIO PRODUCTS FOR FILM/VIDEO PRODUCTION



ZAXCOM DEVA

Zaxcom (Midland Park, NJ) announces Deva, a 6-pound, battery-powered digital 4-track recorder designed for TV/film sound location recording. Featuring 20-bit DACs and 110dB dynamic range, Deva will run for two hours on a standard NPI camera battery (three hours with an NMI battery) and offers up to 2.5 hours of recording time on a removable hard drive with confidence playback in Record mode. On-board digital effects include EQ, compression and gating, and the unit provides phantom and T power and SMPTE timecode sources. I/Os include mic and line analog and AES/EBU digital. Prices start at \$7,950.

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SOUNDSTAR DMS DIGITAL DUBBER

SoundStar (Burbank, CA) introduces its Digital Machine-Room System (DMS™), a hard disk-based digital dubber system for film and video audio post applications and theme park and special-venue installations. Based on the Spectral Prisma™ digital audio engine, the system is

flexible and modular and may be configured from 8 to 4,800 simultaneous playback channels and from 8 to 240 record tracks. Designed to emulate the functionality of traditional 35mm film dubbing equipment, the SoundStar system allows single-track slip sync, play in reverse, varispeed and scrub, and also adds the speed and versatility of digital control. Dubbers and recorders may be controlled via a touch-screen interface or via JSK and Lynx controllers; the system also offers linear and nonlinear transfer capabilities to and from various DAWs.

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B&K MINIATURE MIC

The DPA4060 miniature microphone from Brüel & Kjaer (dist. by TGI North America, Kitchener, Ontario) features a newly de-



signed, 5.4mm prepolarized condenser cartridge and is specifically designed for film, TV, theatrical and other body-mounted applications. Offering flat response from 20 to 25k Hz and a dynamic range of 134 dB, the DPA4060 has two removable protection grids, providing acoustic equalization to optimize performance when the mic is placed on a performer's head or in the traditional lavalier position. The grids are easily cleaned, and the mic is available in beige, white or black. The DPA4060 is primarily designed for wireless applications and will fit most VHF and UHF professional systems; a 48V phantom-powered version is available.

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LIGHTHOUSE AUDIO/TC SWITCHER

The Lighthouse K Series Analog Audio Switcher from Lighthouse Digital (Grass Valley, CA) can be used to switch analog audio among 1,024x1,024 I/Os or as a SMPTE timecode switcher with 128x128-channel capability. Available in configurations from 32x32 up, the unit will be available with a 512x512 AES/EBU option later this

year. All I/O connections are via 25-pin D-sub connectors, and the unit offers more than 100 dB of dynamic range for analog audio paths. Equipped with front panel I/O selection and LCD status screen, the unit has rear RS-232, RS-485, RS-422 and GPI ports for remote control. Lighthouse K Series matrix switchers may be used alone or as part of a multi-vendor system.

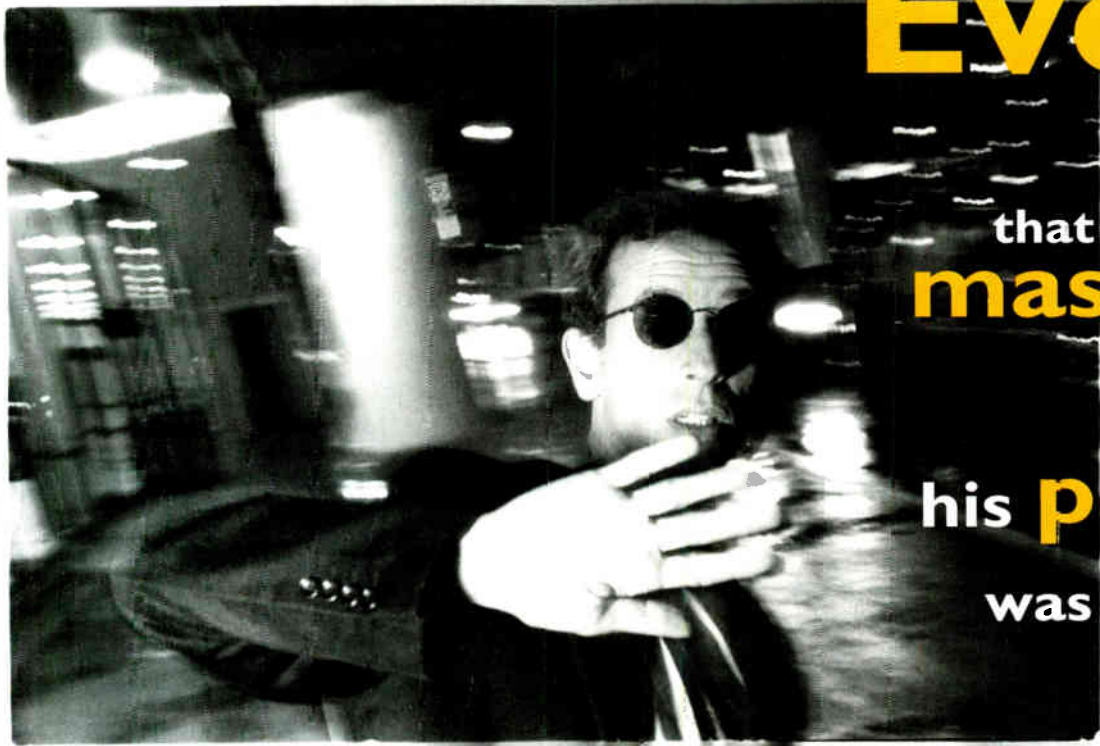
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EDIT POINT AV-4 ROUTER

The AV-4 router from Edit Point (Burbank, CA) is an expandable routing switcher for nonlinear editing applications, offering four inputs and four outputs for composite video plus two channels of audio; any

combination of sources can be sent to any of the four outputs. Offering a programmable alphanumeric display, audio and video signal presence indicators, external sync, RS-232, RS-485, RS-422, MIDI and GPI interfaces, the AV-4 provides ¼-inch TRS jack inputs for audio signals, which are balanced throughout. An upgrade path allows the unit to be expanded to 8x8.

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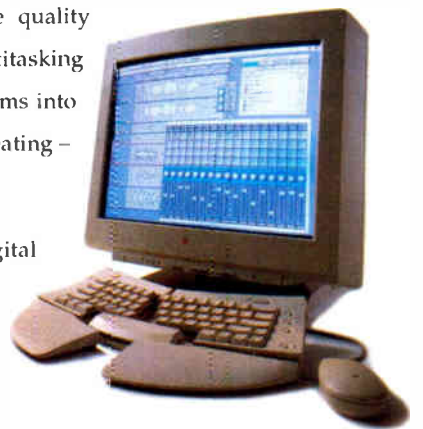


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Apollo 13 sound edited at Hastings Sound and Wonder Dog Music. *Dead Man Walking* sound edited at Hastings Sound.

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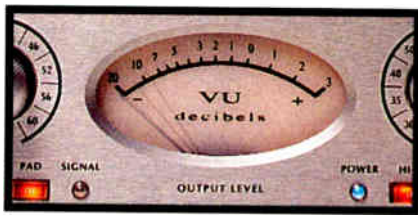
It's an innocent-looking word, isn't it? Fact is, gain is at the very heart of sound recording and reproduction. And the more gain there is at any point in a signal chain, the more critical the device supplying it becomes.

Consider the microphone preamp, for example. This device is entrusted with supplying gain to the most important—and most fragile—of all audio signals: the microphone output. No wonder the microphone preamp is treated with an almost superstitious reverence. We audio folk take any device with so much influence on our sound very seriously.



in Mic Preamps





Fortunately, manufacturers take the care and feeding of the mic signal as seriously as we do. There are numerous companies making top-notch preamps, from units with '50s-era tube warmth to video-bandwidth monsters with clinical precision. And while preamp manufacturers have been racing toward audio hyperfidelity, there has also been a tendency to add more and more features, and units offering compression, equalization, HF enhancement and even onboard digital converters in addition to preamp functions are becoming more common.

Let's look at a number of new designs (listed alphabetically) that have come to market over the past year or so. We'll start out with vacuum tube designs and conclude with solid-state approaches.

TUBE PREAMPS

ADL—Anthony DeMaria Labs— (New Paltz, N.Y.) has announced its MTS-6 mainframe system, which can host up to six channels of processing in a four-rackspace enclosure. The first module to be released is an all-tube mic preamp; tube EQ and mastering dynamics processor will follow. The mainframe system offers busable signal routing, remote power supply and an optional remote fader box. Price TBA.

Applied Research and Technology (Rochester, N.Y.) offers two stereo tube preamplifiers, the Dual MP and the Pro MPA. Both incorporate a hybrid solid-state input section with tube stage for user-controlled tube character and saturation. The Dual MP (\$329) offers line and mic inputs, +20dB gain switch, input and output level controls, phantom power, phase reverse switch and four-stage LED tube character indicator. The Pro MPA (\$599) adds dual VU meters, variable highpass filter and 10-stage LED tube character meter ranging from Clean to Warm to Clip.

Avalon Designs' (San Clemente, Calif.) new Merlin Thermionics Model 737 Voice Processor is a hybrid mic pre, compressor and EQ using dual triode vacuum tubes in its transformer-balanced input stage and opto-compressor stage. The Model 737 (\$1,695) also offers all-discrete 4-band

parametric EQ, sweepable highpass filter and large VU metering.

New from **Demeter** (Santa Monica, Calif.) is the Model HM-1 tube mic preamp. The HM-1 (\$1,249) is a hybrid design, using tubes for amplification and solid-state components for driver functions. Each channel of the Demeter features Jensen transformers, variable gain, output level control, line input, high-pass filter, phase reverse and pad. Ten-segment LED output level meters offer switchable sensitivity.

DigiTech (Sandy, Utah) entered the mic preamplifier market with its VTP-1, a 2-channel tube preamp with 4-band EQ and 18-bit A/D converter. The EQ offers sweepable mid bands with switchable low-cut filter and EQ in/out bypass. Front panel preamp controls include mic/line input select, phase invert, -20dB pad and 48V phantom power. Onboard A/D converters offer AES/EBU or S/PDIF outputs at 44.1 or 48 kHz. The VTP-1 (\$999) also offers a balanced, post-EQ send/return loop and optional transformer-balanced input circuit.

New from **Drawmer** (distributed by QMI of Hopkinton, Mass.) is the 1962 stereo tube mic preamp/EQ with digital converters. The 1962 (\$5,500) offers mic, line and aux inputs; variable high- and lowpass filters; 3-band EQ (preset frequency and Q); Zero Overshoot limiter; high- and low-frequency Enhance circuit and Tube Drive control. The master stereo mix output section offers pan and level controls. The digital output section boasts resolution up to 24 bits, 15 digital noise shaping or dither algorithms and word sync input. The 1962 is also available in an analog-only configuration (\$2,349).

Dunmore Vintage Audio (Universal City, Calif.) offers two "50s-style" tube mic preamp products, the stereo DR 2MP and the mono DR 1MPC mic preamp/compressor. Both offer all-tube input stages, line and mic inputs, phantom power, phase reverse and mic pad. The DR 2MP (\$1,599) has master volume controls for variable tube saturation and compatibility with +4dB and -10dB equipment. The DR 1MPC's (\$1,499) compressor section emulates the characteristics of the classic Teletronix LA-2A, offering input and compression level controls, up to 40 dB of gain and 30 dB of compression.

DW Fearn (Pocopson, Pa.) makes hand-crafted, all-tube equipment, its latest being the stereo VT-2 mic preamp. The VT-2 (\$3,500) offers custom-designed Jensen transformers on inputs

and outputs, switchable 20dB pad, true needle-style VU meter, phase reverse and low-impedance input for use with transformerless mics. An optional LP-1 line pad accessory (\$80) allows the unit to be used as a "tube warmer" for line-level signals. The VT-2 uses point-to-point wiring for optimum performance.

Giltronics (Kapaa, Hawaii) debuts its 356AT all-tube stereo mic/line preamp. The 356AT (\$3,500) offers two mic stages and two line stages; these can be used separately or cascaded in pairs to net 70dB gain. Other features include four input and four output transformers, output level control, phantom power, phase invert, pad and switchable input sensitivity. The 4TMP (\$3,600) offers four 49dB all-tube preamps in one unit. Controls include output level, sensitivity switch, pad, phantom power and phase reverse.

Groove Tubes (Sylmar, Calif.) offers the MP-1, an all-tube, half-rackspace mic preamp with external power supply. The MP-1 (\$870 without power supply) has mic or line inputs, phantom power, bass rolloff switch, 20dB pad, phase invert switch and transformer-balanced output. A three-stage LED meter tracks output level; a lighted needle-style VU meter is also available. Two MP-1s can be mounted together in a single rackspace chassis, both powered from a single PS-2 power supply.

The VAC RAC 4000 from **Inward Connections** (West Hills, Calif.) is a modular vacuum tube system that includes the TMP-1 mic preamp. The TMP-1 (\$895, module only) offers transformer-balanced mic input, phantom power, and a switchable 20dB pad on mic input and mic phase reverse switch. Gain adjustment on the TMP-1 is through detented gain and trim control knobs for repeatable settings. The TMP-1 also offers a needle-style VU meter and unbalanced front-panel line input.

The **Joe Meek** Tube Channel VC2 (\$2,500) combines a mic preamplifier, photoresistive (non-VCA) compressor, HF enhancer, VU metering and tube make-up stage. Designed by legendary engineer and Joe Meek's personal tech Ted Fletcher, the monó VC-2 is a tribute to '60s audio engineering. The VC-2 features mic and line inputs, phantom power, phase reverse, pad, highpass filter and signal insert points. The VC2 is distributed by Peninsula Marketing (Torrance, Calif.).

New from **Manley Laboratories** (Chino, Calif.) is the MIC EQ500, an all-

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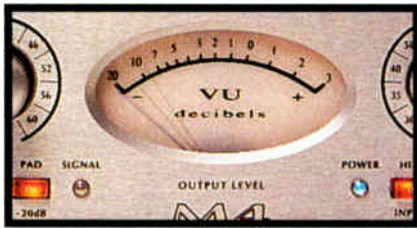
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tube mic preamp with passive two-band equalizer. The MIC EQ500 (\$2,900) uses a transformer-coupled input stage similar to the Manley Variable Mu Compressor/Limiter, offering 55dB of gain, phase invert and phantom power. The EQ section has two switchable low-band frequencies and five high frequencies, each band offering peak or shelf modes; gain is ± 10 dB in 2dB steps. The EQ design introduces no more than three passive components into the signal path. A balanced "breakout point" between mic pre and EQ allows the insertion of an outboard processor.

Requisite Tube Audio Engineering (Glendale, Calif.) offers three mic preamps in its lineup, including the all-tube Y7 mic pre (\$2,899 stereo, \$2,100 mono), the B4B tube/solid-state mic pre (\$999) and the Y760 all-tube

mic pre/compressor/limiter (\$2,999). All three offer transformer-balanced inputs; the Y7 and Y760 offer custom hand-wound input and output transformers. The Y7 boasts point-to-point hand wiring, top-quality components, independent gain and attenuation controls and transformer-balanced line input. The stereo B4B offers a tube front end with solid-state balanced output, phantom power, pad and hi-z input.

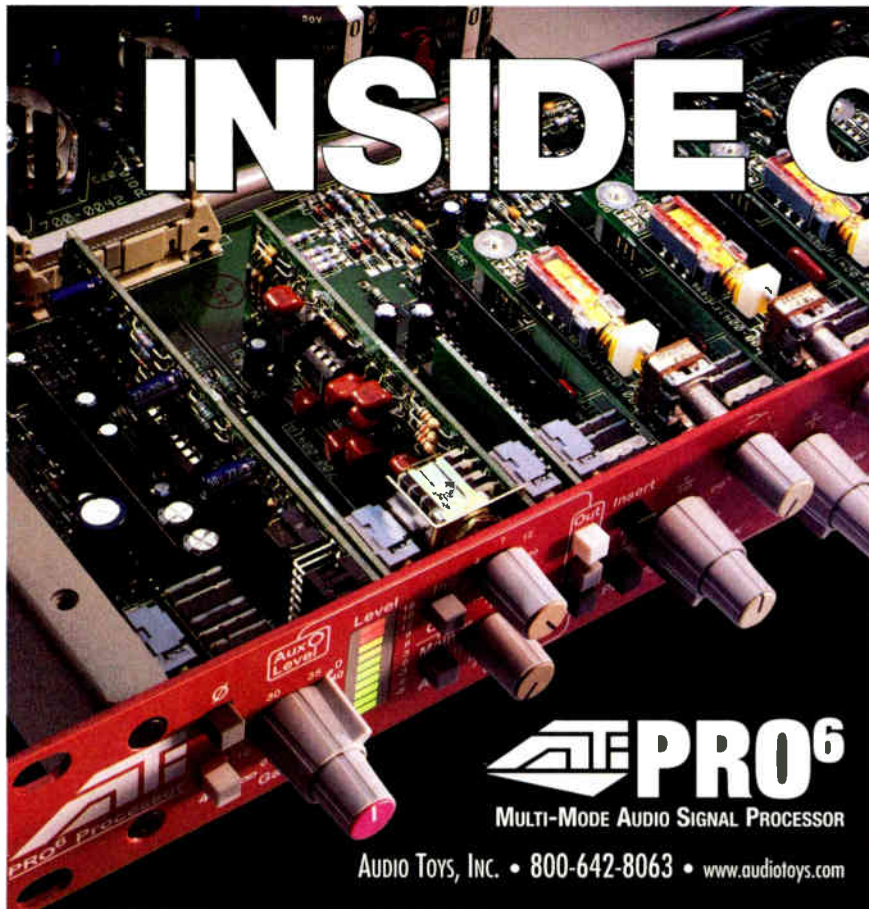
The mono Requisite Y760 adds a variable-mu all-tube compressor to the tube mic preamp, offering Fairchild-style presets, manual attack and release controls, independent limiter with threshold control and make-up gain control at the output transformer. A 24-position stepped attenuator is available as an option for both the Y7 and the Y760.

Rolls (Midvale, Utah) introduces the RP533 Studio Tube Multi-Processor. The RP533 (\$700) offers a high-voltage tube mic preamp with transformer, compressor/limiter and sonic exciter. The RP533 has a line input, calibrated metering for output level or compressor gain reduction

and phantom power. The compressor section offers threshold, ratio, attack time, release time and output level controls; the exciter has Bottom and Definition controls.

The **Studer** (Nashville) D19 Mic-VALVE is a 2-channel solid-state mic preamplifier with switchable "valve dignifier" tube stage and 20-bit stereo A/D converter. The MicVALVE (\$4,950) offers Bass Warmth, Drive and Tube Warmth controls; transformer-balanced mic inputs; switchable DSP dithering and noise shaping for AES/EBU digital output; balanced insert for external processing before or after tube stage and optional ADAT or TDIF digital outputs.

The MPC-100A (\$2,400) from **Summit Audio** (Soquel, Calif.) is a single-channel tube preamp combining mic, Hi-Z and line inputs and a compressor/limiter with fast attack times to optimize the signal prior to the digital domain. Features include "Clean to effect" tube sounds, 2-position pad, clip indicator, stepped attenuator, threshold/release controls, attack and release preset switches, VU meter for input/output/gain reduction, stereo link and by-



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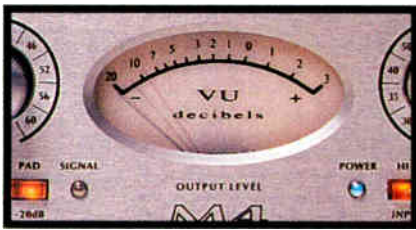


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TL Audio (distributed by Sascom, Oakville, Ontario) debuts two new processing lines, the tube Indigo Series and the solid-state Crimson Series. The Indigo 2001 (\$1,295) 4-channel tube mic preamp offers continuously variable input and output gain controls,

phantom power, highpass filter, phase reverse and peak LED metering. The solid-state Crimson 3001 (\$795) is identical in specs and features.

TL Audio's new Indigo 2051 (\$1,395) mono tube voice processor combines the functions of a mic/instrument preamp, compressor and EQ. The mic preamp offers phantom power, gain, phase and highpass filter controls; the front panel instrument input has high-gain/low-gain switch. Compressor controls include attack and release times (fast or slow), threshold, ratio and make-up gain. The 4-band EQ offers shelving high and low filters with two selectable frequencies each, semi-parametric low-

mid and high-mid bands (fixed Q) and pre/post compressor switch. The solid-state Crimson equivalent, the 3051, lists for \$795.

The **Tube-Tech** MP 1A is an all-tube stereo mic preamp with input and output transformers, DI inputs, switchable pad, switchable phantom power, two-frequency highpass filter and fully-floating balanced outputs. Gain is set on a detented knob in 5dB steps, with a range from 20 dB to 70 dB. The MP 1A is now distributed by TC Electronic (Westlake Village, Calif.) and has a list price of \$2,395.

SOLID STATE DESIGNS

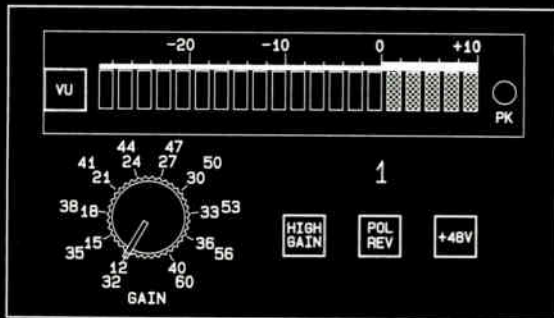
The L200 rack system from **API Audio Products** (Springfield, Va.) will hold up to 12 API Legacy modules, including the 212L all-discrete, solid-state mic preamp module. The 212L (\$579) is based on the API2520 op-amp, offering a 20dB pad, switchable 48-volt phantom power and 5-segment LED VU meter. Inputs and outputs are transformer-balanced.

New from **Audio Toys Inc.** (Columbia, Md.) is the 8MX2, an 8-channel mic preamp and mixer suitable for live sound or multitrack recording. The solid-state, single-rackspace 8MX2 (\$1,899) is a full-featured mixer complete with cue circuit; headphone and monitor outputs; tape outputs and returns; gain, level and pan control for each input channel, and proprietary inputs and outputs for linking multiple 8MX2s. Each high-voltage mic input offers a limiter with adjustable threshold, phase reverse, phantom power and ground lift.

Audio Upgrades (Van Nuys, Calif.) offers its redesigned stereo mic preamp, now delivering better noise performance and a slew rate of over 4,000 volts per microsecond. The High-Speed Microphone Preamp (\$1,350) offers a transformerless design, variable 18dB to 60dB gain, selectable phantom power and individual peak indicators. High-current output handles long lines and difficult loads.

Avalon Designs (San Clemente, Calif.) uses all-discrete Class A circuitry in its M5 and M2 solid-state mic preamps. The mono M5 (\$1,800) offers transformer-balanced dynamic or 48-volt input, M&K high-voltage mic input, variable gain in 2dB steps, high-impedance line and DI inputs, variable high-pass filter, phase invert switch, 20dB pad, phantom power, analog VU meter and peak LEDs. The M4 (\$1,900) adds a remote interface card to the M5, allow-

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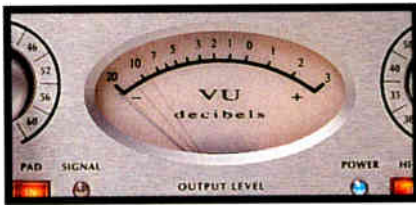
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ing remote control of gain and polarity with the R4 (\$400). The stereo M2 (\$3,200) offers two channels of Class A amplification in a single-rackspace enclosure, with a high-resolution LED meter on each channel.

The FCS-916 (\$999) from **BSS** (distributed by Harman Pro, Nashville) is a single-channel mic preamp and equalizer featuring all-discrete circuitry, mic

and line inputs, sweepable high- and lowpass filters, phantom power and switchable input/output 5-segment LED meter. EQ section offers four fully parametric bands with individual bypass; high and low filters can be switched between bell and shelf modes. Notch filter mode, available on each EQ band, engages a 0.04-octave filter with up to 30dB of attenuation.

The RQP 3200 "channel strip" from **Calrec** (distributed by AXI, Rockland, Mass.) combines the functions of a mic preamp, line input, four-band EQ, compressor and expander/gate in a single-rackspace package. The RQP 3200 (\$3,850) solid-state mic preamp stage

offers stepped coarse adjust (6dB increments) and continuous fine adjust gain controls. Adjustable high- and lowpass filters can be switched into the compressor sidechain for frequency-dependent compression, as can the unit's four-band EQ. Compressor and expander/gate offer switchable attack times and variable release times.

Calrec's RQP 4400 (\$4,450) offers four solid-state stereo mic preamps in a single rackspace, with switchable phantom power, highpass filter, lowpass filter, phase reverse and M/S conversion per stereo pair. Each stereo pair offers coarse sensitivity adjust from -72 dB to +12 dB (in 6dB increments) as well as ± 3 dB gain trim and balance controls.

dbx (Sandy, Utah) has updated its 286 mic preamp/processor to create the 286A preamp, compressor, de-esser, spectral enhancer and expander/gate. The 286A (\$349) offers OverEasy compression with threshold, ratio and attack and release time controls, feed-forward de-esser, high- and low-frequency spectral enhancer and gate with variable ratio. An insert jack allows additional processing between preamp and compressor; a master bypass switch eliminates all onboard processing. The 286 also offers a line input for instrument amplification and processing.

Also new from **dbx** is the Blue Series Model 786 Precision mic preamp. A discrete solid-state design, the 786 (\$2,499) offers transformer-coupled mic input, detented gain and fine-adjust level controls, phantom power, pad, phase invert and switchable low-impedance input mode. Input stage features the dbx M8 mic preamp module; a transformer-coupled output stage will drive long lines at high output levels. An optional A/D converter output is also available. Phase-accurate EQ offers 16dB boost or cut over a sweepable 5kHz to 40kHz frequency range.

Geoffrey Daking & Co. (Wilmington, Del.) offers the 52270 mic pre/EQ for the 90-series modular system. The 52270 (\$1,250) features transformer-balanced input and output, all-discrete circuitry with Class A amplifiers, separate mic and line input level controls, high- and lowpass filters, phantom power, 20dB pad and remote mute and bypass. The EQ section has four bands with stepped frequencies, 16 dB of boost/cut and individual bypass.

Focusrite (distributed by Group One, Farmingdale, N.Y.) has released a new product line, the Green Range, which includes a stereo mic preamp and mono voice processor. The Green

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—Nick Batzdorf, **Recording Magazine**

"Impressive... there are few models in its price bracket
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—George Petersen, **Mix Magazine**

"Really impressive... incredibly smooth and well balanced from highs to
lows... the Nile V is a speaker you can live with day in and day out."

—Bruce Bartlett, **Pro Audio Review**

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Audix Nile V

SPECIFICATIONS

frequency range	(±2dB) 40Hz-20Hz
power capacity	100 - 350 watts
nominal impedance	8 ohms
sensitivity	90 (1w@1m)
crossover frequency	2.2kHz

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1 Dual Mic Pre is a 2-channel mic pre-amp with phantom power, phase reverse and mute switches for each channel. The Green 1 (\$1,099) input stage is based around an exceptionally quiet, low-distortion circuit with very wide frequency response. Each channel has phase reverse, +48V phantom power, highpass filter and relay-switched mute operated manually from the panel or under external control.

The Focusrite Green 3 Voice Box includes a mic preamp, equalizer and dynamics section. The equalizer offers adjustable high and low shelving filters and a fully parametric mid band. The dynamics section includes compression, de-essing, and a noise-reducing expander; individual processors can be bypassed. The Green 3 Voice Box has a list price of \$1,349.

Using the same circuitry as its 8-channel Model 801 preamp, the **Grace Designs** (Boulder, Colo.) Model 201 offers two channels of solid-state, transformerless mic preamplification in a single-rackspace chassis. Amplification is set with 24-step gold contact gain and trim controls. Other controls include phantom power, phase reverse and 20dB pad. High-current output section will drive long cable runs and low-impedance loads. The Model 201 (\$1,895) offers a broad frequency response of 4.5 Hz to 1 MHz (-3 dB).

The **John Hardy Company** (Evanston, Ill.) has updated its popular M-1 mic preamp, creating the M-2. Like the M-1, the M-2 is built around the 990 discrete op-amp and Jensen JT-16-B input transformer. Controls include a 16-position gain switch (3dB increments), 20dB pad or 20-ohm (low-impedance) mic switch, phantom power, phase reverse, ground lift and chassis ground isolate switches. Options for the M-2 include include peak LED (\$35), 20-segment bar graph meter and peak LED (\$135) and Jensen output transformer (\$110). The John Hardy main-frame system (\$525) can be configured with up to four M-2s in a single-rack-space chassis (\$935 with a single M-2).

The Classic Channel from **LA Audio** (distributed by Audio Nova, Dorval QC, Canada) is a single-channel mic

—CONTINUED ON PAGE 221

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World Radio History



YAMAHA 02R

I have a friend who is steeped in the analog tradition. When he learned that I had purchased a Yamaha 02R back in April of '95, he surmised that using a digital mixer must be much like working with an analog console. Well, yes and no. In fact, there are many unique aspects to working with digital mixers, and a few specific ways in which the user can stretch the capabilities of the 02R:

Power User Tips

BY MICHAEL COOPER

RØDE.™ A Mic For All Seasons.

A great mic can make your track come alive. The wrong one can put it to sleep forever. You've heard that every mic has its day. But you haven't the time or money to try every one. What you really want is a great mic that shines in multiple situations. A mic you can trust.

You want the NT2.

Hand made in Australia, it's just right for your lead and background vocals. Fabulous on your acoustic guitar. Perfect on the drum overheads. Great on those wind instrument overdubs. In fact, this mic will deliver the results you need on just about any source material you throw at it.

The NT2 Large Diaphragm Condenser Microphone features:

- Large Capsule with Gold-Plated Membranes
- Low Noise, Transformerless Circuitry
- True Condenser Elements
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- Full Frequency Response
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Finally an affordable, multipurpose, professional recording microphone that provides outstanding performance in a variety of uses.

Get the NT2 and discover how comforting it is to have a great mic at hand whenever you call on it.

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New product launch for '97

For all those who have visited recent shows and have kept their eyes on the press you will be aware that Soundscape Digital Technology have now launched the SSAC-1 and SS810-1 Audio Interface for the SSHDR1 Digital Audio Workstations.



The SSAC-1 Accelerator Card is designed in true Soundscape style, expanding and enhancing the existing unit instead of replacing it, and can be easily retro fitted to all existing units in the field.

The SSAC-1 is a plug in DSP card which fits into the SSHDR1 and gives several times the processing capability of the existing unit. The SSAC-1 also gives an extra 8 channels of I/O in the form of a TDIF port (Tascam Digital Interface), and is necessary for all existing customers who wish to upgrade to the new 32bit Version 2.0 software and expand the number of In's and Out's. Also available will be the SSHDR1Plus which will have the SSAC-1 fitted as standard. All upgraded systems will then have 10 inputs and 12 outputs when connected to a Tascam DA88 or Yamaha O2R / O3D console with no extra hardware required. Version 2.0 software allows up to 12 track

Version 2.0 software allows up to 12 track playback per unit

playback per unit (with recommended drives).

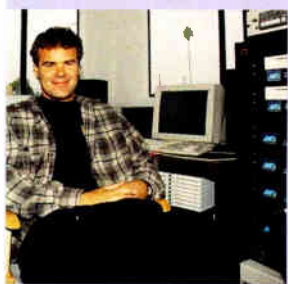
The SSAC-1 also includes an Expansion Port which can connect to an external Expansion Chassis (available later in '97). This has a 512 channel audio bus and allows up to 14 cards to be plugged in for additional DSP (for real-time plug-in effects) and I/O capability. Multiple Soundscape SSHDR1 units can be connected to one Expansion Chassis and will be able to share disk space, I/O and processing.

For those customers who wish to expand the number of I/O with additional hardware, the SS810-1 is an 8 channel digital and analogue 19" 2U rack unit which connects to the SSAC-1 Accelerator Card via the TDIF connector. The SS810-1 has 8 inputs and 8 outputs with balanced XLR connectors, using 20 bit Crystal Semiconductor converters to provide superb quality A/D & D/A conversion. It also has an ADAT Optical Digital interface providing direct connection to ADAT via the ALESIS "Lightpipe".

Word/Super clock in and out and 8 x 10 segment LED level metering is provided as standard. The SS810-D is supplied without the analogue converters, for users who just wish to connect an ADAT directly and don't need the extra analogue channels.



Serafine adds further systems



Serafine FX, Venice, California has taken delivery of a further two Soundscape SSHDR1 systems expanding their audio to picture facilities.

"We now have six Soundscape systems at the studio," explains Frank "and we've used the SSHDR1

on almost every project that's come through the facility. Soundscape is fast becoming one of the top systems around in digital audio post production here as well as around the world."

Frank, whose credits include *Tron*, *Star Trek "The Motion Picture"* and *The Hunt for Red Oktober* is currently working on the CBSTV series *Orleans* starring Larry Hagman and a 3D IMAX feature.

Soundscape price restructure

Soundscape Digital Technology are pleased to announce a solid NEW and exciting pricing strategy for 1997 for the SSHDR1 range of Digital Audio Workstations. With the imminent release of the SSAC-1 accelerator card and the new 8 channel audio interfaces SDT have restructured pricing to provide products and features to meet the needs of specific users.

The price of the core 8 track SSHDR1 has been reduced, so making it easier for customers to 'get on board' with Soundscape at a lower price. This is called the SSHDR1FS (fixed software). Customers who purchase the SSHDR1FS will be supplied with V1.18 software, the Remote Control Software (RDC) for RS422/MMC control of DA88, ADAT and VCR's and the .AVI file player.

For many customers the existing features of the V1.18 software (which also includes lock up to VITC, support for video capture cards, Reverb and Time Module Plug-Ins) are more than adequate for their needs.

Continued on back page.

Contents

- New Products
- Sound to picture
- EDL/Auto conform
- Music recording & MIDI
- CD Mastering
- Version 2.0
- Future Developments

SSHDR1 sales now exceed 3,500 systems

Sound *for* picture editing

Audio/Video *in sync.*

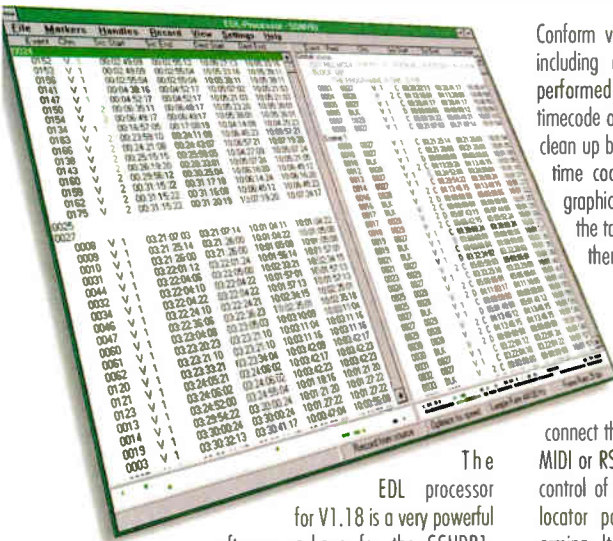
AV Master from Fast Electronic was the first audio video card to implement PCI bus mastering, a technological breakthrough for PC based digital video and multimedia. This well established card guarantees the superb video quality that until recently has only been achieved on expensive systems in TV studios. AV Master is fully compatible with the SSHDR1 and together provide smaller and medium-sized video studios, businesses, agencies, multimedia producers and ambitious videographers the ability to process images digitally, with full frame accurate lock up to the audio



from Soundscape - on the same PC at the same time. Full motion video playback through the V1.18 .AVI file player makes it possible to smoothly scrub audio and video together for accurate placement of sound effects, rushes and dialogue. With the AV Master, image quality and performance are enhanced by high quality filtering, 32bit capturing, graphics, accelerated video effects and comes complete with Media Studio 2.5VE for the latest in 32bit editing software.

Contact: Fast Electronic International Tel: +49 89 50206-0. Fast Electronic UK Tel: 0181 968 0411 CompuServe: GO FAST Internet: <http://www.fast-multimedia.com>

EDL Processing & Auto Conform



Conform via RS422. There are many useful features including a manual conform facility which can be performed if there are rushes with discontinuous timecode on the tape. The software can also be used to clean up bad EDL's. Handles, fades, scene markers and time code offsets can be added or edited, with a graphic display of where the audio is positioned on the tape, and whether it is recorded on the disk - so there is no excuse for errors.

Machine Control

Included in V1.18 is the new remote control driver software (RDC) for ADAT, DA88 or VCR's. It is possible using this software to connect the PC to any of these devices using a standard MIDI or RS422 card, for total control of the tape transport, locator positions and track arming. It is also possible to jog and shuttle, and even eject the tape.



The EDL processor for V1.18 is a very powerful software package for the SSHDR1. It can read all common EDL formats (inc. CMX, GFG, SONY) and supports SONY 9-pin protocol for Auto

The Nutty Professor



Odin Benitez of Dimension Sound, Burbank, CA recently used Soundscape to cut sound on *The Nutty Professor*. "As feature film editors we work on one reel at a time. We save the edits of each reel as an arrangement on the SSHDR1. I was working with Pro Tools early on and still use Digidesign products. The main

reason why we looked into the Soundscape system was that we were immediately attracted to both the interface and the software. The SSHDR1 is very quick to use, and it's got a very easy learning curve. In "Ace Ventura-When Nature Calls" I took a monkey scream and pitched it up to make it sound like a bat was screaming. Manipulating effects with software, as this system allows is very nice, in Pro Tools you would need to use Sound designer or Sample Cell".

Recent Customers

Cleartcut Productions, Saho, London have just finished the latest **McCain Oven Chips/National Lottery TV advert** to be shown this month on UK national television. Music, sound design and dubbing were completed using the SSHDR1. Recent projects also include a VW radio commercial and a major multimedia project for **Microsoft Networks starring Oz Clark**.

Kitefield Music Productions, London, UK is one of London's major music for television production companies. Last year the company provided music and effects for **Dispatches, Equinox and Panorama** on the SSHDR1. They are currently producing a major documentary called **I Caesar for BBCTV and A&E (USA)**.

Rare Ltd, Twycross, England, one of the top video game production companies, has recently completed both the **Donkey Kong Country** and **Killer Instinct** series of video games on their SSHDR1's delivered last summer.

CBC Toronto took delivery of 12 x SSHDR1 systems for their Radio production departments. SDT Ltd. recently visited the company for two days of product training. Also in broadcast, **SABC South Africa** increased their number of SSHDR1 systems to 24 in December 1996.

Broadcast Audio have installed the first SSHDR1 system at their new production facilities in Birmingham, England. Ex-Central Television's **Jim Tetlow**, who spent 6 years on **Spitting Image** and other major drama series for national television, invested in the SSHDR1 for their dubbing, track laying and CDR production suites.

HDS Studios in Middlesex, England have installed a SSHDR1/Fast AV Master system for their Digital Betacam edit suite. This powerful audio/video setup is to be used in all areas of post production for several new programs to be broadcast on the forthcoming **Channel 5**.

Broadcaster **Emperor Rosko** went digital last year and invested in the SSHDR1. Based just outside Los Angeles, Rosko is producing shows for **Virgin Radio, Europe 1, Radio Bahrain, Red Dragon, Red Rose and GWR**.

Music recording / CD mastering

S.D.T. & Emagic Partnership announced at NAMM



German company, Emagic, announced an extension for Logic Audio Windows with support for the Soundscape SSHDR1 hardware at the NAMM show in Los Angeles. This award winning software will combine the superb audio quality and powerful DSP processing of Logic Audio and the SSHDR1 hardware, providing the ultimate in audio/MIDI sequencing. As the SSHDR1 only uses the computer for display purposes, it is possible to run the SSHDR1 and Logic Audio Windows on a lower powered PC than is normally required, with a totally integrated user interface.

The SSHDR1 can also synchronize to hardware MIDI sequencers or software running on Atari computer. Cakewalk Pro Audio, also supports the SSHDR1.



Ooh! Aah! GINA G!

Steve Rodway (MotivB) and his record label FX Music are currently riding high in the US charts with Gina G and "ooh, aah just a little bit" which was recorded and edited on the SSHDR1. The hit, which reached number one in the UK, is part of a long list of hits produced by the team of re-mixers and songwriters at their London, UK based studios. Other hits produced and re-mixed by Steve include: "Tell me what you want", The Spice Girls and "Addicted to Love", Robert Palmer. Steve is busy at the moment finishing Gina G's debut album and is re-mixing "A Red Letter Day" soon to be released by the Pet Shop Boys.

48 track systems in Warsaw & Lisbon

S.D.T. distributors Trans European Music (Belgium) and Diapasao (Portugal) have installed 48 track systems into two major European studios.



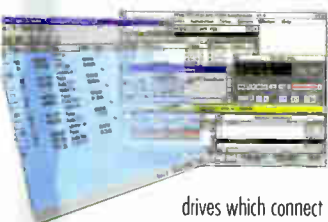
Diamond Recording in Warsaw, Poland combined the 48 tracks of Hard Disk recording with a Soundtracs Jade 48PB console to provide 100 input channels at mix-down together with 48 direct output channels. Wladyslaw Bawiek, Diamond's president, comments "We

use the SSHDR1 system extensively between 14 and 16 hours a day including weekends, and the system keeps running without any problems whatsoever. We have actually never been able to cause the system to hang." Diapasao Instrumentos Musicais installed a 48 track system at EDIT Recording Studios in Amadora, Lisbon. Writer, producer and musician Ramiro Martins chose an SSHDR1 48 track system as the heart of his studio. The system which is synchronized with Steinberg's Cubase last year recorded and edited a live session featuring Acid Jazz star Pedro Abrunhosa which was broadcast on national radio.

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New CDR Plug-in's

The PDAE CDR mastering software for the SSHDR1 is a professional CDR package for audio CDR machines. It provides THE total solution for music recording studios or radio stations regularly mastering CD's. There are two differing hardware options for CDR recording, SCSI type drives which connect to the PC and compile audio based on the .WAV file format, and Audio CDR's, which can also connect to the PC via the serial port, but send the audio data via the AES/EBU or SPDIF outputs on the SSHDR1. The



main advantage of this type of CDR burning is the time factor. However, it is far less risky when the intention is to produce a Glass Master. This month we will be launching a proprietary CDR compiler which is fully compatible with SCSI CDR software from German company PointCD. This software is a "Plug-in" and is supplied as part of the SSHDR1 CDR package (it is already available for other editors and is commonly known as Red Roaster). The software works with Soundscape arrange files and allows PQ editing, crossfades, ISRC codes etc. and generates a merged file on the PC with a data file for PointCD, which burns the disk.

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Recent Customers

Kasim Sultan former bassist with Todd Rundgren's Utopia, has recently taken delivery of an SSHDR1 system at his home studio in Stater Island, NY. Kesim who has recently returned from a ten month world tour with **Meatloaf**, managed to fit in time to perform on the latest album from **Celine Dion** and appear on **The Late Show with David Letterman**. The studio has been completely rebuilt around the SSHDR1, Tascam DA88 and Mackie equipment.

Former **Scorpions** guitarist and composer **Uli John Roth** added a further unit upgrading to 48 tracks at his studio in Tunbridge Wells, UK. Uli, who now has 6 systems is currently completing "**Requiem for an Angel**" a symphonic rock piece as part of his 'Symphonic Legends' series of CD's. The first CD in the collection entitled "**The Sky of Avalon**" is due to be released in the UK next month.

Robert Plant bassist **Charlie Jones** and engineer **Phil Andrews (Hugh Cornwall, "The Stranglers")** have recently completed a track soon to be released in the US. The track which was the first to be produced on their SSHDR1 system features **Robert Plant** and **Jimmy Page**. All the backing tracks were recorded directly onto hard disk and then transferred to 24 track tape to record Jimmy's guitar and Robert's vocals. All tracks were then transferred back to hard disk for the final mix. Charlie and Phil are now in production of their new album due for release in 1997.

Merseyside, England, is the home for new record label '**Loop**'. Owned by ex-Christians' members **Henry Priestman and Gary Christian, Lloyd Masset (OMD) and Pete Fullwell (The Christians)**, the label is recording brand new artists from the crew. "The aim of the label is to promote new artists who combine R&B with the Merseyside scene", explains Henry. 'Loop' now own five SSHDR1 systems.

S.D.T. are pleased to announce **new distribution partners for Asia**. The SSHDR1 together with the new hardware options to be released this month were recently shown at the **Vietnam Film Festival in Ho Chi Minh City**. Distribution throughout Vietnam will be handled by O'Connors Singapore Pte. Ltd. Tel: (65) 4737944, Alpha International Tel: (822) 551 2776 have been appointed for South Korea. India is to be handled by ModiAudi Coordinate Pte. Ltd. Tel: (91) 44 4994547 and distribution in Singapore continues via Audi Pte Tel: (65) 2832544 with O'Connors being newly appointed as Soundscape resellers in Singapore.

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Soundscape price restructure

Continued from page 1.

V2.xx software will require the SSAC-1 and a software license (password) which will be provided free of charge to all existing customers who purchased their SSHDR1 at the original price. Nick Owen, Commercial Director for SDT says "One very important point that we have emphasised to customers since day one is that

the value of their investment in Soundscape is not devalued by price decreases year by year or that the product is not replaced by 'the new model'. Our policy is one of expandability and upgradeability as well as giving value for money and this new policy means that although the pricing of individual components has changed the overall package price remains the same. Now we

can bring the power of Soundscape to more users at a lower price with an upgrade program to our high end systems, whilst continuing to support all our existing customers".

There is also no need to upgrade the computer to run any of the new software as is the case with many other systems. However, Windows '95 is required.

Soundscape™ Version 2.0

V2.xx is a brand new 32bit operating system which expands and enhances the SSHDR1 with state of the art software and DSP technology. The software currently runs under Windows '95, although it is planned that the system will run on Windows NT, but not in the first release version. As Windows NT separates the hardware and software layers, the SSHDR1 may also become cross-platform in the future.

V2.xx supports multiple units in one arrange window and uses a completely new disk format that supports two separate drives per unit (ie. disk A, disk B) and has a sub-directory structure. Long take file names (64 character), a comment field (128 character), new attribute flags (archive, read-only etc.) and different kinds of files (eg. arrange files, presets for EQ, Reverb, etc.) can be stored on the disk. The Take Directory (renamed SFile Manager) is now more like the Windows 95 Explorer and files can be moved or copied easily between different units and drives.

The main change for V2.xx is that the SSAC-1 Accelerator Card is required and the number of playback tracks is increased to 12 per unit (with recommended drives). The new mixer page that

supports the additional 8 inputs and outputs has a completely user definable routing/channel structure and presets for different configurations can be saved or loaded as required. Each channel can have any number of real-time processes running (eg. EQ, Compressor, Reverb, etc.) limited only by the available DSP processing power. In fact, you can have as many mixing channels as you need, with internal busses and effects processes, and external aux sends/receives using the original 2 in/4 out of the SSHDR1, plus the 8 in/out TDF part on the SSAC-1 (this could be connected to the SS810-1 or to a DA88 or Yamaha O2R etc.).

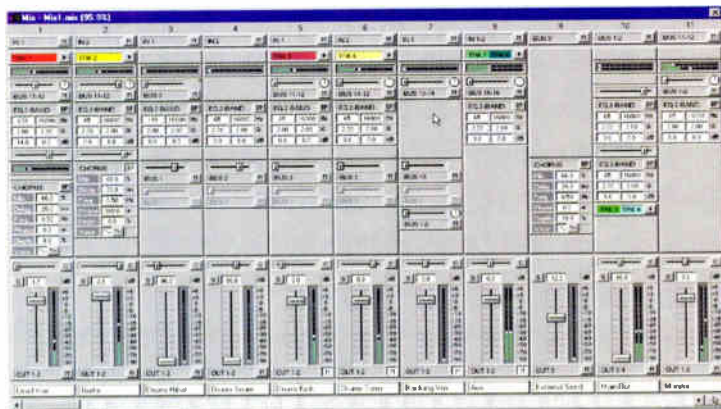
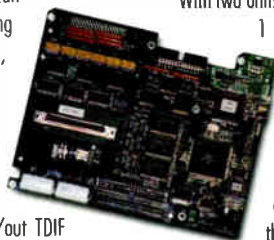
A typical use for a programmable mixer configuration could be when you have a final mixing situation with 8 tracks from Soundscape and 8 tracks from an ADAT or DA88. You could define a 24 channel mixer (with 12 for Soundscape tracks, 8 for digital tracks from the tape), with a stereo main output from digital

OUT1/2 of the SSHDR1, analogue IN 1&2 as an auxiliary effects return or stereo input from a mix of MIDI instruments and as many auxiliary sends as required from the remaining outputs. A recording mixer could have a completely different configuration. Automation of the mixer is planned for a later release.

With two units, the TDF connection on the SSAC-1 allows 8 channels of audio to be interconnected, so it's like having internal digital connections in the mixer. This means that you can route audio from one unit through real-time effects processes on the other and then back into the mix, making maximum use of both DSPs. New for '97 will be real-time effects algorithms from different 3rd party vendors which can be run simultaneously by the DSP on the SSAC-1.

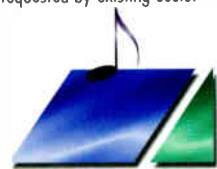
The SSAC-1 also includes the Expansion Port which allows connection to a 512 channel external audio bus from the 3U Expansion Chassis. This allows playback/record tracks and inputs/outputs to become resources in the bus which can be routed where required. Connecting audio channels from one unit to input/outputs on another is then possible and multiple units can be connected together to form much larger systems. The Expansion Chassis will also allow multiple DSP and I/O cards to be installed for greatly increased mixing capability and virtually unlimited processing power for effects algorithms.

Punch in/out recording is included in the V2.xx DSP code, as are the MIDI tempo map and play looping requested by many users for music applications. There will be several other software releases to include general editing and user interface additions throughout 1997, many of which have been requested by existing users.



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GAIN STAGING AND METERING

The most critical aspect of working with a digital mixer is setting the gain throughout the various stages of the console. With an analog console, you want to avoid turning up the mic/line preamp only to attenuate the signal further along the signal path (which would degrade signal-to-noise). With a digital mixer such as the 02R, you want to boost your preamp gain so that the highest pre-EQ peaks are just below clipping the A/D converters, for the highest-resolution input. If subsequent EQ or dynamics processing boosts the signal above the mixer's headroom, use digital attenuation to reduce post-converter levels before the additional processing in the chain. The 02R offers digital attenuation pre-EQ/pre-dynamics.

The 02R's Meter page offers meter source points for pre-EQ (post A/D), post-EQ (post-ATT and post-dynamics) and post-fader. You should religiously check all three source points during recording and mixing to keep bit resolution and signal-to-noise optimal, and to prevent digital-domain clipping. Use the 02R's permanent peak hold feature to check all peak levels on all channels and buses (including both pre- and post-fader tape, aux and stereo bus levels) and adjust accordingly.

It's important to realize that lowering the master fader will not rid you of distortion caused by a *pre-fader* dynamics section being clipped by aggressive EQ boost on the stereo bus (or by multiple channel faders being set too high). You must use the stereo bus' pre-EQ attenuator/boost control (found both on the ATT page and the stereo bus' EQ display) to lower the level *before* the EQ and fader. Although the 02R's LCD Meter pages offer only pre- and post-fader source points for the stereo bus, you can view post-EQ, pre-dynamics levels by selecting the stereo bus' EQ display and viewing the software meters in the upper right-hand corner of the LCD. To see *de facto* pre-EQ levels, temporarily bypass the EQ and observe the same meters.

The 02R's stereo bus clips a little easier than the input of a Panasonic SV-3700 or SV-3800 R-DAT. (Neither machine's meters show "overs" for digital input signals.) When you're monitoring an R-DAT's digital return to the console during mixdown, the 02R's stereo LED meters reflect R-DAT levels and may not reveal pre-fader clipping of the 02R's stereo bus. I always view the LCD meters for the stereo bus' dynamics (whether or not

I'm processing the stereo bus) in order to see pre-fader levels along with the LED meters' 2-track return levels.

Unfortunately, the 02R does not offer attenuators for its tape and aux buses. If the pre-fader levels on any of these buses are too hot, you can temporarily group all the faders and rotary encoders that feed the bus that's clipping and ride them down by the same amount with one fader. You may be tempted to lower each channel's attenuator by the same amount, but this will affect the thresholds of any (post-ATT) dynamics processing you've already set for individual channels, throwing off the mix.

ADDING MORE AUX SENDS

If you've got an ADAT that's not being used (e.g., a 24-track studio mixing a 16-track project), you can expand the 02R's number of external aux sends to 14. (This trick may work with other MDMs; however, for experimentation purposes, I only had access to ADATs.) Simply route any of the 02R's 40 inputs (and/or two internal effect returns) to, say, bus 1 in addition to the stereo bus. Activate Digital In on your unused ADAT and put its first track into Record Ready. The analog output of this track can now be sent to any external effect box you wish. Since 02R card slots 3 and 4 do not require being selected in order for the console's bus outputs to reach the inputs of ADATs belonging to those slots, you won't have to give up any 02R analog inputs to do this trick. And if you're using all of your ADATs at mixdown, even one or two empty tracks can handily serve as aux sends. The only down side to this scheme is that a channel's dry level will completely determine how much effect it will get (relative to other channels' dry levels feeding the same bus output). So it usually works best to restrict any one bus to serve only related sources (e.g., members of a brass section or background vocals).

Actually, any ADAT track can serve as a "direct out" effect send for the same individual track. Since both digital and analog outputs are always hot on an ADAT, you can route the digital output to the console and the analog output to an external effects processor. In this way, a 16-track setup adds 16 additional effect sends to the 02R, bringing the total number of external sends to 22! If you install the 02R's CD8-AI analog I/O card, you'll get eight more analog bus outs that can also do double-duty as external effect sends during mixdown.

CHAINING DYNAMICS PROCESSORS IN SERIES

Although the 02R only allows one dynamics processor patch per channel at any given time, you *can* slap two compressors on the same track without leaving the digital domain. For example, you can de-ess a vocal, remove it from the stereo bus and route it (digitally) to an unused track on your MDM. Put that track into Record Ready and set the MDM to receive source signal on Record Ready tracks during play. The tape return of this track can now be patched to another 02R compressor and assigned to the 02R's stereo bus. This digital bounce works well as long as you set one compressor for a quick release time. For some reason, when both compressors are set for moderate-to-long release times, the high end will suffer and the track will sound dull.

USING CHANNEL DELAY FOR EDITING

The 02R's channel delay can assist you in "cut and pasting" ADAT tracks together. If your source material is ahead of the beat at the edit point, you can slide it back into the groove (when you do the digital bounce again) by adjusting its channel delay in the 02R before it gets bounced to the new track. This usually goes faster than re-adjusting machine offsets.

AUTOMATING CHANNEL ON/OFFS

Here's a tip for efficiently muting/unmuting channels where breakdowns or build-ups occur in an arrangement during mixdown. Use the 02R's peak hold meter function to provide you with a "frozen display" of activity on various tracks. For setting channel on/off meters to pre- or post-EQ (i.e., sourced pre-fader and pre-mutes). Cue up to the point where you hear several new tracks entering the mix, deactivate and then reactivate the peak hold to "clear" the meters, let the multitrack roll for a few bars, then stop and review the meter pages for activity on muted channels. The peak hold meters will provide a frozen visual display of which channels need to be unmuted at that point in the mix (and which "open" channels can now be muted).

TEMPORARY USE OF GROUPS AND PAIRS

There's no rule that says you must group or pair faders and mutes throughout an entire mix. Where one channel of a fader group needs to be edited in-

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dependently of the other faders during a verse, you can create a new, permanent scene memory for that verse which deletes that channel from the group. But this strategy locks *all* channels into current settings, which may become inappropriate as the mix progresses further. Since you cannot change fader groupings while the automix is in progress, the best solution is to *temporarily* ungroup the solitary channel, store this setup in the current scene memory, make your automix moves for the verse, and then return the channel to the group to restore the original scene memory. (Remember to always recall a scene before making changes to it, or settings in the data buffer caused by automix moves will become part of the scene memory!) This will not undo any data stored previously in the verse for the other channels in the group.

Similarly, you can pair adjacent channels long enough to set the same EQ, then unpair them to set different levels for each fader and for independent control throughout the mix. Or group mutes only long enough to turn their channels off simultaneously during a musical rest; then ungroup them to proceed with individual channel on/offers for the remainder of the mix.

ALTERNATE USES FOR MIX SCENES

Scene memories are useful for more than just snapshot automation of specific mixdown sessions. I reserve the first dozen scene RAM slots for default tracking setups (including starting points for pre-fader cue mixes and channel routing to MDMs), default mixdown setups (with aux bus fader levels optimized to match the headroom/nominal operating levels of my various outboard FX boxes, and FX returns routed and panned appropriately), and setups for dubbing cassettes, remastering and striping timecode. Be sure to also store the cue mix and channel settings for specific tracking sessions.

When mixing, it's not usually a good idea to edit dynamics processing via scene memory changes. (Dynamics cannot be automated in real time in the automix memory.) In most cases, recalling channel library or dynamics library patches (at specific SMPTE times) is a better strategy. This is because scene changes "lock in" early decisions in the mix process for *all* channels of the console, making subsequent editing more likely (and potentially more substantial) than if the RAM edits were focused solely on the channel(s) in need of dynam-

ics editing. Unfortunately, a scene memory change is necessary if you wish to change the key assignment of a dynamics processor. A software limitation prevents dynamics/channel library insertions from effecting such changes.

AUTOMATION WITH ADATS AND A BRC

When the BRC is operating at a 44.1kHz sampling rate, it generates SMPTE timecode approximately 8% slow. The 02R's automation has trouble with this slow code, and will display Frame Drop Out messages and sometimes cause timing inaccuracies in the automix. (Based on my personal experience, there is an apparent threshold for problems to start occurring, as running the BRC around 50 cents off-pitch creates no audible problems for the 02R.) The problem is that the BRC's SMPTE frame rate is tied to the sample rate; e.g., at 48 kHz and for 30 fps format, the BRC spits out one frame every 1,600 samples ($30 \times 1,600 = 48,000$). If the sample rate slows down from the nominal 48kHz rate to 44.1 kHz, the frame rate slows down proportionately to a rate of 27.56 fps. This is a hardware limitation of the BRC, so it can't be fixed with a software update.

By the way, don't take the 02R's Frame Drop Out messages literally. I used a Brainstorm Electronics SR-15+ Time Code Distripalyzer to analyze the BRC's timecode output at 44.1 kHz (the SR-15+ analyzes, reshapes and distributes timecode, all for \$1,490 list). The SR-15+ confirmed that the BRC does *not* drop any frames nor introduce any other apparent errors to the timecode bit stream. The 02R simply has a narrow window of tolerance for nonstandard frame rates.

The Alesis AI-2 Synchronizer can do the math necessary to generate sample-locked 30Hz/30 fps code at 44.1 kHz, but it must be the sync master for the ADATs (i.e., it must be connected to the 9-pin interface over which clock signals travel). This necessitates removing the BRC from the system. If you do this, you'll need to send track-arming commands to the AI-2 via MMC messages from, say, a sequencer. (The BRC cannot send track-arm messages to the AI-2.) In my mind, this is counter to the reason I bought a dedicated hardware remote in the first place!

This leaves BRC owners who wish to master at 44.1 kHz with two options: 1) record and mix ADAT tracks at or very close to 48 kHz so that the 02R's dynamic automation can function prop-

erly, and then use sample rate conversion or D-to-A-to-D conversions to convert to 44.1kHz rate; or 2) pitch the BRC down to 44.1 kHz, stripe the output of a timecode generator to tape and feed that track's output to the 02R. Such "wild" timecode is not a problem if you're only using the timecode for the 02R's automation and not to lock to picture. If you're synching audio to video, you *must* use sample-locked timecode to prevent drift.

It's generally best to use SMPTE for automation, as MTC is less accurate. Whatever code format you decide to use, *stick with it*. Switching from SMPTE to MTC (or vice versa) in the middle of a mix can cause offsets and event timings to subtly change due to inaccuracies in the translation from one format to another.

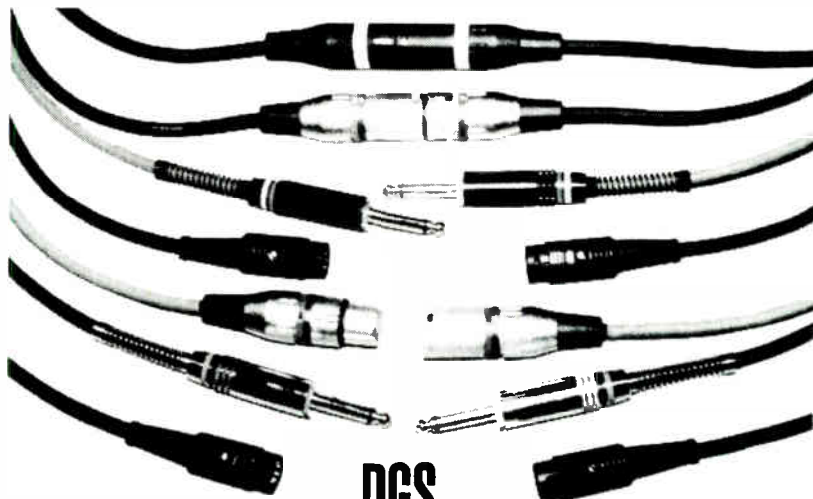
NEUTRALIZING THE GREMLINS

I've only had one 02R system scramble occur in the past eight months, but it does happen! The usual recourse is to re-initialize the console (by pressing and holding the left cursor button on power-up) but, as this will wipe out the console's entire stored memory, you should bulk-dump all contents to Yamaha's Project Manager software or a MIDI sequencer beforehand. Alternatively, putting the 02R into a different mode will sometimes fix a system scramble and avoid the need for re-initialization. I got out of my one system scramble trap by pressing and holding the Utility button while powering up (this displays the current version of the software). This will not fix any aberrant file data, but you can at least avoid bulk-dumping all the good stuff!

By the way, system software Version 1.1 is the latest version as of October '96. All previous versions had a bug that turned off dither on all buses on power down. Even though the LCD showed dither to be "on" after powering up again, you had to reselect it to be on, or it would actually be off. Dither is selected simultaneously for the digital *and analog* stereo outputs, something to keep in mind when mixing to analog 2-track. You may want to redither the 02R's 20-bit DACs before they truncate the internal 32-bit bit stream. You'll get less distortion but a little more noise. It's a personal choice.

Whatever you do, make sure you use good *digital* cables when mixing in the digital domain. Although the AES/EBU spec uses three-conductor cable with XLR connectors, ordinary microphone cable has neither the nec-

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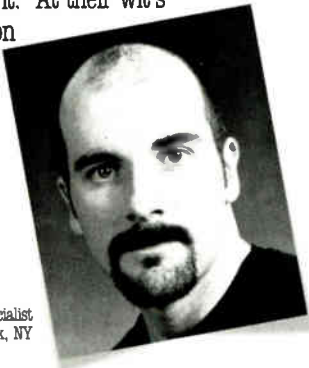
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essary bandwidth to transmit clock signals reliably (without dropouts), nor the correct impedance to keep jitter down. I've printed the same mix twice digitally to R-DAT, first using Apogee Wyde Eye digital cable and then Conquest Series IIB mic cable (Conquest's best) on the 02R's AES output. The mix printed with the Apogee Wyde Eye cable had more clarity, high-frequency detail and depth. It was also more open and had a wider stereo image. Good digital cables *do* make an audible difference. When cloning DAT masters, I always do a direct straight-wire transfer between R-DATs, using a 1-meter Wyde Eye cable and completely bypassing the 02R to keep jitter to an absolute minimum.

LATE BREAKING NEWS

At the recent AES convention in L.A., JLCoooper showed an early prototype of an adaptation of VDesk automation (a software-only version) for the 02R. It runs on a Mac via the 02R's rear panel RS422 port and features user-configurable templates for virtual controls. And ARX showed the new Phantom Plus, a 4-channel phantom power supply listing for \$280 that offers a compact and economical solution for using 02R inputs 9-16 with condenser mics.

The long-established Stewart PM-4 4-channel phantom power supply offers even greater economy at \$171 list, but with fewer bells and whistles (no power switch or rackmount kit). Both units offer rock-solid performance.

At the time of this writing, Yamaha was hinting at a substantial software upgrade of the 02R, which would give it (as yet unspecified) expanded capabilities. The company showed a single-slot AES/EBU card at the AES show. (The old AES/EBU card took up two slots of valuable digital I/O real estate.) One potential use for the card, besides I/O to a suitably equipped digital multitrack deck, is as pre-fader digital insert sends for the 02R's master faders. That is, you can send an entire mix out two buses on the AES card to, say, a TC Electronic M5000 and return the latter's output via the 02R lines 17/18. It's refinements and improvements like these that keep diehard 02R owners like myself hopeful that the 02R will remain one step ahead of obsolescence for some time to come. ■

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

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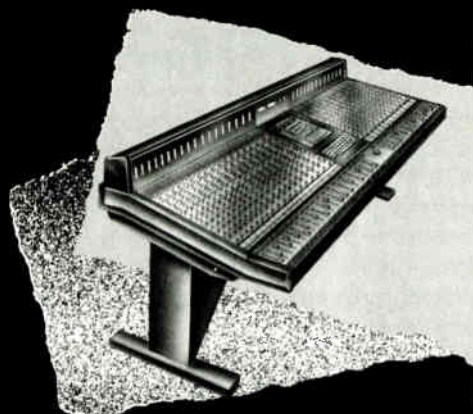
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Level Practices

In Digital Audio

Digital recording is simple: All you do is peak to 0 dB and never go over! And things remain that simple until you discover one DAT machine that says a tape peaks to -1 dB while another machine shows an Over level, yet your workstation tells you it just reaches 0 dB! This article will explore the concepts of the digital Over, machine meters and loudness, and will take a fresh look at the common practices of dubbing and level calibration.

DIGITAL METERS AND OVER INDICATORS

DAT recorder manufacturers pack a lot in a little box, often compromising on meter design to cut costs. A few machines' meters are driven from analog circuitry, which is a known source of inaccuracy. Even manufacturers who drive their meters digitally (by the values of the sample numbers) often cut costs by putting large gaps on the meter scale. As a result, there may be a -3 point and a 0dB point, with a big no-man's-land in between. And the manufacturer may feel it's doing you a favor by making the meter read 0 even if the actual level is between -1 and 0, or by setting the threshold of the Over indicator inaccurately or too conservatively (long before an Over actually occurs). But even if the meter has a segment at every decibel, on playback, the machine can't tell the difference between a level of 0 dBFS (FS = Full Scale) and an Over.

Distinguishing between 0 dBFS and an Over requires intelligence that I've never seen on a DAT machine or a typical DAW. I would question the machine's manufacturer if the Over indicator lights on playback: it's probably a simple 0dB detector rather than an Over indicator.

There's only one way around this problem. Get a calibrated digital meter. Every studio should have one or two. There are lots to choose from, including models from DorrOUGH.

BY BOB KATZ

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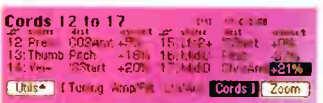
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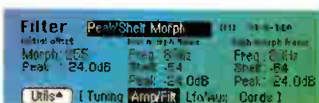
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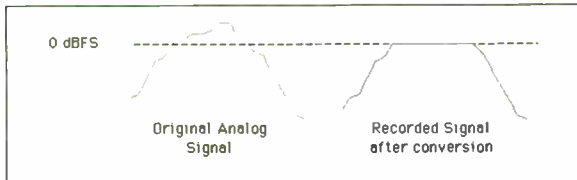
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Mytek, NTT, Sony and others. Each offers unique features (including custom decay times and meter scales), but all the good meters agree on one thing: the definition of the highest measured digital audio level. A true digital audio meter reads the numeric code of the digital audio and converts that to an accurate reading. A good digital audio meter can also distinguish between 0 dBFS and an Over.

THE PARADOX OF THE DIGITAL OVER

If digital levels cannot exceed 0 dB (by definition, there's nothing higher), then how can a digital signal go Over? One way a signal can go Over is during recording from an analog source. Of course, the digitally encoded level cannot exceed 0 dBFS, but a level sensor in an A/D converter causes the Over indicator to illuminate if the analog level is greater than the voltage equivalent to 0 dBFS. If the recordist does not reduce the analog record level, then a maximum level of 0 dB will be recorded for the duration of the overload, producing a nicely distorted square wave. There is a simple (digital) way of detecting if an Over has occurred, even on playback, by looking for consecutive samples at 0



An example of an analog signal going Over (area above dotted line)

dB, which is a square wave. A specialized digital meter determines an Over by counting the number of samples in a row at 0 dB. The Sony 1630 Over standard is three samples, because it's fair to assume that the analog audio level must have exceeded 0 dB somewhere between sample number one and three. Three samples is a very conservative standard; most authorities consider distortion lasting only 33 microseconds (three samples at 44.1 kHz) to be inaudible.

Manufacturers of digital meters often provide a choice of setting the Over threshold to 4, 5 or 6 contiguous samples, but in this case it's better to be conservative. Even 6 samples is hard to hear on many types of music, so if you stick with the 3-sample standard, you'll guarantee that virtually all audible Overs

will be nipped in the bud, or at least detected! Once you've used a good stand-alone digital meter, you'll never want to go back to the built-in kind.

USING EXTERNAL A/D CONVERTERS OR PROCESSORS

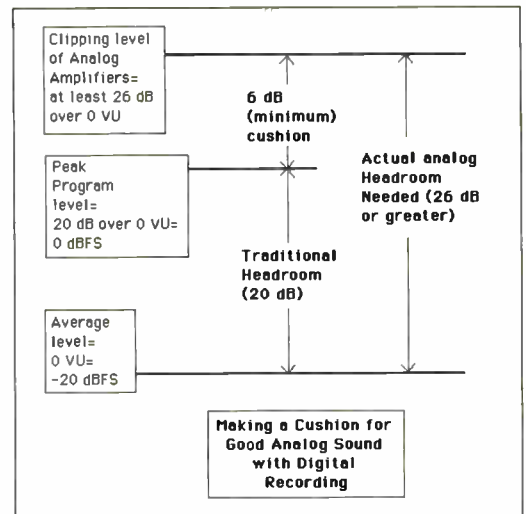
There is no standard for communicating Overs on an AES/EBU or S/PDIF line. So if you're using an external A/D converter, the DAT machine's Over indicator will probably not function properly, if at all. I advise ignoring the indicator if it does light up, unless the manufacturer confirms that it's a sample counting Over indicator (it's more likely to be an analog-driven level detector). Some external A/D converters do not have Over indicators, so in this case, there's no substitute for an accurate external meter; without one I would advise not exceeding -1 dB on the DAT machine. I've already received several overloaded tapes that were traced to an external A/D converter that wasn't equipped with an overload indicator.

When making a digital dub through a digital processor you'll find most do not have accurate metering (be sure to read "The Secrets of Dither," October '95

Mix before using any digital processor). Equalizer or processor sections can cause Overs. Contrary to popular belief, an Over can be generated even if a filter is set for attenuation instead of boost, because filters can ring. Digital processors can also overload internally in a fashion undetectable by a digital meter. Cascaded internal stages may "wrap around" when they overload, without transferring Overs to the output. In those cases, a digital meter is not a foolproof Over detector, and there's no substitute for the ear, but a good digital meter will catch most other transgressions. When you hear or detect an overload from a digital processor, try using the processor's digital input attenuator to correct the problem.

PRACTICE SAFE LEVELS

When recording to digital tape from an analog source, if you have an external digital meter set to 3 samples, then trust its Over indicator and reduce gain slightly if it illuminates during recording. If you've been watching your levels prior to generating the Over, chances



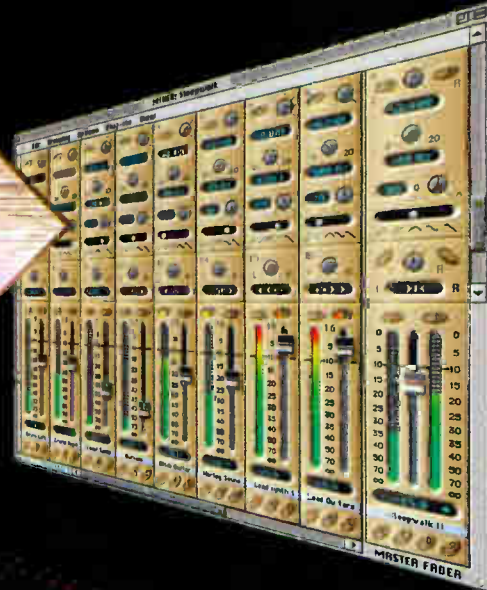
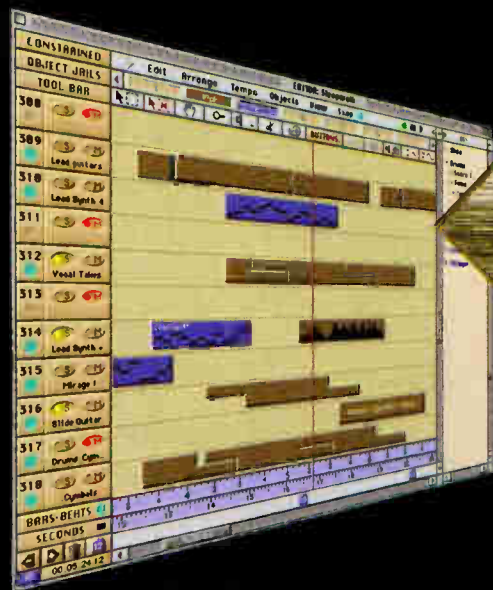
Translating between analog and digital points in the system

are it will be an inaudible, 3-sample Over. However, if you have to rely on the built-in Over indicator of a DAT machine, only experience with that machine will tell how accurate its metering is. With a DAT machine's meter, it may be better not to exceed -1 dB on music peaks. You won't lose any meaningful signal-to-noise ratio, and you'll end up with a cleaner recording, especially when sending it for mastering. At the mastering studio, a tape that is too hot can cause a digital EQ or sample rate converter to overload. There are ways around that, but not without complicating the mastering engineer's life.

HOW LOUD IS IT?

Contrary to popular belief, the levels on a digital meter have (almost) nothing to do with loudness. For example, you're doing a direct-to-2-track recording (some engineers still work that way!) and you've found the perfect mix. Now, keep your hands off the faders, watch the levels to make sure they don't overload and let the musicians make a perfect take. During take one, the performance reached -4 dB on the meter; and in take two, it reached 0 dB for a brief moment during a snare drum hit. Does that mean that take two is louder? If you answered "both takes are about the same loudness," you're probably right, because in general, the ear responds to average levels, not peak levels, when judging loudness. If you raise the master gain of take one by 4 dB so that it, too, reaches 0 dBFS, it will now sound 4 dB louder than take two, even though they both now measure the same on the peak meter.

Do not confuse the peak-reading meters on digital recorders with VU meters. Besides having a different scale, a



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VU meter has a much slower attack time than a digital peak meter. A digital peak meter has 1-sample (11 microseconds at 44.1 kHz) attack time, while an ANSI standard VU meter takes 300 ms to respond, closer to the response of the ear. But do not rely on the VU meter to judge loudness. The VU meter does not discriminate between low-frequency and high-frequency sounds, but the ear reacts differently to each.

The VU meter can be fooled by different amounts of compression; it is possible to apply compression to an audio signal so that it sounds much louder than the apparent reading on a VU meter. So use your ears, not your meters! Did you know that an analog and digital recording of the same source sound very different in terms of loudness? Make an analog recording and a digital recording of the same music. Dub the analog recording to digital tape, peaking at 0 dB. The analog dub will sound about 6 dB louder than the all-digital recording! That's a lot. This is because the typical peak-to-average ratio of an analog recording is about 14 dB, compared with as much as 20 dB for an uncompressed digital recording. Analog tape's built-in compressor is a means of getting recordings to sound louder (oops, did I just reveal a secret?). That's why pop producers who record digitally may have to compress or limit to compete with the loudness of their analog counterparts.

JUDGING LOUDNESS THE RIGHT WAY

Since the ear is the final judge of loudness, is there any objective way to get a handle on how loud your CD will sound? The first key is to use a single D/A converter to reproduce all your digital sources. That way you can compare your CD in the making against other CDs, in the digital domain. Judge DATs, CDs, workstations and digital processors through this single converter.

Another important tool is a calibrated monitor level control with 1dB step settings. In a consistent monitoring environment, you can become familiar with the level settings of the monitor control for many genres of music, and immediately know how far you are (in dB) from your nearest competitor, just by looking at the setting of the monitor knob. At Digital Domain, we log all monitor settings used on a given project, so we can return to the same setting for revisions.

THE MOVING AVERAGE GOES UP AND UP...

Some of the latest-model digital processors permit making louder-sounding recordings than ever before. Today's mastering tools could make a nuclear bomb out of yesterday's firecrackers. Producers today are convinced that they have to make loud records to attract radio program directors. This has inspired a conscious race to be the loudest on the block (repeating the fiasco of the distorted 45 rpm single, for those who remember that far back). I am very concerned about this new loudness race, because there can be no winners, only losers. If we keep compressing sound so each CD sounds louder than its competition, we create an incremental cycle whose end is distortion, whether the music is acoustic-based or electric. Furthermore, this practice doesn't help the consumer, who has to turn the volume control down to get the same apparent loudness out of the speakers; in recent years, the loudness race has greatly increased the differences among the existing loudest and softest CDs, forcing the consumer to make extreme changes in volume control every time discs are changed. And many records that were engineered to sound great on the radio sound like horse manure on home systems (from mid-fi on up). This is madness! Records are supposed to sound great at home!

Here's my recommendation: When mastering, use a calibrated monitor control so you know exactly how loud your CD will be. You can still make a hot CD and get any sound your heart desires (and a good mastering engineer will help make that CD sound incredible). Just try to make the apparent loudness of the musical material fall within, not above the average of other CDs that are out there (in the particular musical genre); while it may seem the hip thing to do, you really don't have to make your CD louder than the loudest current CD. By doing so, you're only creating a moving target for the next person to shoot down, which is a disservice to the entire industry.

CALIBRATING STUDIO LEVELS

This section is intended primarily for the maintenance engineer. Let's talk about alignment of studio audio levels. Stick around for a new perspective on level setting in the hybrid analog-digital studio.

MARKING TAPES

dBm and dBV do not travel from house

to house. These are measurements of voltages expressed in decibels. I once received a ¼-inch tape in the mail marked "the level is +4 dBm." +4 dBm is a voltage (it's 1.23 volts, although the "m" stands for milliwatts). The ¼-inch tape has no voltage on it; it doesn't have any idea whether it was made with a semi-pro level of 0 VU = -10 dBV or a professional level of +4. Voltages don't travel from house to house, only nano-Webers per meter on analog tapes, and dBFS on digital tapes.

That doesn't diminish the importance of the analog reference level you use in-house. It's just irrelevant to the recipient of the tape. Just indicate the magnetic flux level that was used to coordinate with 0 VU. For example, 0 VU = 400 nWeber/m at 1 kHz. Most alignment tapes have tables of common flux levels, where you'll find that 400 nWeber/m is 6 dB over 200 nWeber/m. Engineers often abbreviate this on the tape box as "+6 dB/200."

DECIDING ON AN IN-HOUSE ANALOG (VOLTAGE) LEVEL

Just use the level provided by your console manufacturer, right? Well, maybe not...+4dBV (reference .775 volts) may be a bad choice of reference level. Let's examine some factors you may not have considered when deciding on an in-house standard analog (voltage) level.

When was the last time you checked the clipping point of your console and outboard gear? Before the advent of inexpensive 8-bus consoles, most professional consoles' clipping points were +24 dBV or higher. A frequent compromise in low-priced console design is to use internal circuits that clip around +20 dBV (7.75 volts). This can prove a big impediment to clean audio, especially when cascading stages (how many of those amplifiers are between your source and your multitrack?). In my opinion, to avoid the "solid-state edginess" that plagues a lot of modern equipment, the minimum clip level of every amplifier in your system should be 6 dB above the potential peak level of the music. This means at least +30 dBV (24.5 volts RMS) if 0 VU is +4 dBV.

HOW MUCH HEADROOM IS ENOUGH?

Have you noticed that solid-state equipment starts to sound pretty nasty when used near its clip point? All other things being equal, the amplifier with the higher clipping point sounds better, in my opinion. Perhaps that's why tube equip-

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ment (with its 300-volt B+ supplies and headroom 30 dB or greater) often has a "good" name, and solid-state equipment with inadequate power supplies or inadequate headroom has a bad name.

Traditionally, the difference between average level and clip point has been called the headroom, but in order to emphasize the need for even more than the traditional amount of headroom, I'll call the space between the peak level of the music and the amplifier clip point a "cushion." In the days of analog tape, a 0VU reference of +4 dBV with a clipping point of +20 dBV provided rea-

sonable amplifier headroom, because musical peak-to-average ratios were reduced to the compression point of the tape, which maxes out at around 14 dB over 0 VU. Instead of clipping, analog tape's gradual saturation curve produces third and second harmonics, much gentler on the ear than the higher order distortions of solid-state amplifier clipping.

But it's a different story today, where the peak-to-average ratio of raw, unprocessed digital audio tracks can be 20 dB. Adding 20 dB to a reference of +4 dBV results in +24 dBV, which is beyond the clipping point of many so-called professional pieces of gear, and doesn't leave any room for a cushion. If

you adapt an active balanced output to an unbalanced input, the clipping point reduces by 6 dB, so the situation becomes proportionally worse (all those headroom specs have to be reduced by 6 dB if you unbalance an amplifier's output). Be particularly suspicious of consoles that are designed to work at either professional or semi-pro levels. To meet price goals, manufacturers often compromise on headroom in professional mode, making the so-called semi-pro mode sound cleaner! You'll be unpleasantly surprised to discover that many consoles clip at +20 dBV, meaning they should never be using a professional reference level of +4 dBV (headroom of only 16 dB and no cushion). Even if the console clips at +30 dBV (the minimum clipping point I recommend), that only leaves a 6dB cushion when reproducing music with a 20dB peak-to-average ratio. That's why more and more items of high-end professional equipment have clipping points as high as +37 dBV (55 volts!). To obtain that specification, an amplifier must use very high-output devices and high-voltage power supplies. Translation: better sound.

One of the most common mistakes made by digital equipment manufacturers is to assume that, if the digital signal "clips" at 0 dBFS, then it's okay to install a (cheap) analog output stage that would clip at a voltage equivalent to, say, 1 dB higher. This almost guarantees a nasty-sounding DAT recorder, because of the lack of cushion in its analog output section. To summarize, make sure the clip point of all your analog amplifiers is at least 6 dB (preferably 12 or more dB) above the peak level of analog material that will run in the system.

How can you increase this additional headroom—the cushion—in your system, short of junking all your distribution amplifiers and consoles for new ones? One way to solve the problem is to recalibrate all your VU meters. You will not lose significant signal-to-noise ratio if you set 0 VU = 0 dBV or even -4 dBV (not an international standard, but a decent compromise if you don't want to throw out your equipment, and you have the expertise to make this standard stick throughout your studio). Once you've decided on a standard analog reference level, calibrate all your analog-driven VU meters to this level.

Let's discuss the interfacing of analog devices equipped with VU meters and digital devices equipped with digital (peak) meters. When you calibrate a system with sine wave tone, what trans-

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lation level should you use? There are several *de facto* standards. Common choices have been -20 dBFS, -18 dBFS, and -14 dBFS translating to 0 VU. That's why some DAT machines have marks at -18 dB or -14 dB. I'd like to see accurate calibration marks on digital recorders at -12, -14, -18 and -20 dB, which covers most bases. Most of the external digital meters provide means to accurately calibrate at any of these levels.

How do you decide which standard to use? Is it possible to have only one standard? What are the compromises of each? To make an educated deci-

sion, ask yourself: What is my system philosophy? Am I interested in maintaining headroom and avoiding peak clipping, or do I want the highest possible signal-to-noise ratio at all times? Do I need to simplify dubbing practices, or am I willing to require constant supervision during dubbing (operator checks levels before each dub, finds the peaks, and so on)?

Consider your typical musical sources. Are your sources totally digital (DDD)? Did they pass through extreme processing (compression) or through analog tape stages? Pure, unprocessed digital sources, particularly individual tracks on a multitrack, will have peak

levels 18 to 20 dB above 0 VU. Whereas processed mixdowns will have peak-to-average ratios of up to 18 dB (rarely up to 20). Analog tapes will have peak levels up to 14 dB, almost never greater. And that's how the three most common choices of translation numbers (-18, -20, and -14) were derived. That's also why each manufacturer's DAT recorder has a different analog output level. It used to be easy to match a recorder to a console. Only one major manufacturer of DAT machines provides user calibration trims for analog inputs and outputs. My least favorite DAT machines have fixed output levels, and I've installed custom trimpots in many of them.

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RECOMMENDED STANDARDS FOR RECORDING AND BROADCAST STUDIOS

Practicality is our object, in order to simplify day-to-day operation. My personal recommendation for the vast majority of recording studios is to standardize on reference levels of -20 dBFS ~0 VU (here I use the ~ symbol to indicate a test tone reference—program material may read differently), particularly when mixing to 2-track digital from live sources or tracking live to multitrack digital. If you're watching the console's VU meters, you will probably never clip a digital tape if you use -20 dBFS as a reference. (European consoles equipped with PPMs have similar problems to those of us with VUs, since the console's analog PPM is not a true peak meter; it still has a longer attack time than the meter on the digital machine. Can anyone recommend a good reference level to use for PPM-equipped consoles?)

For a busy recording studio that does most of its mixing, recording and dubbing to digital tape, standardizing on -20 dBFS will simplify the process. Recording studios that decide on -18 dBFS ~0 VU (a standard used by a popular DAT manufacturer) will run into occasional digital clipping. That's why I'm against -18 dBFS as a standard for recording studios using VU meters for recording.

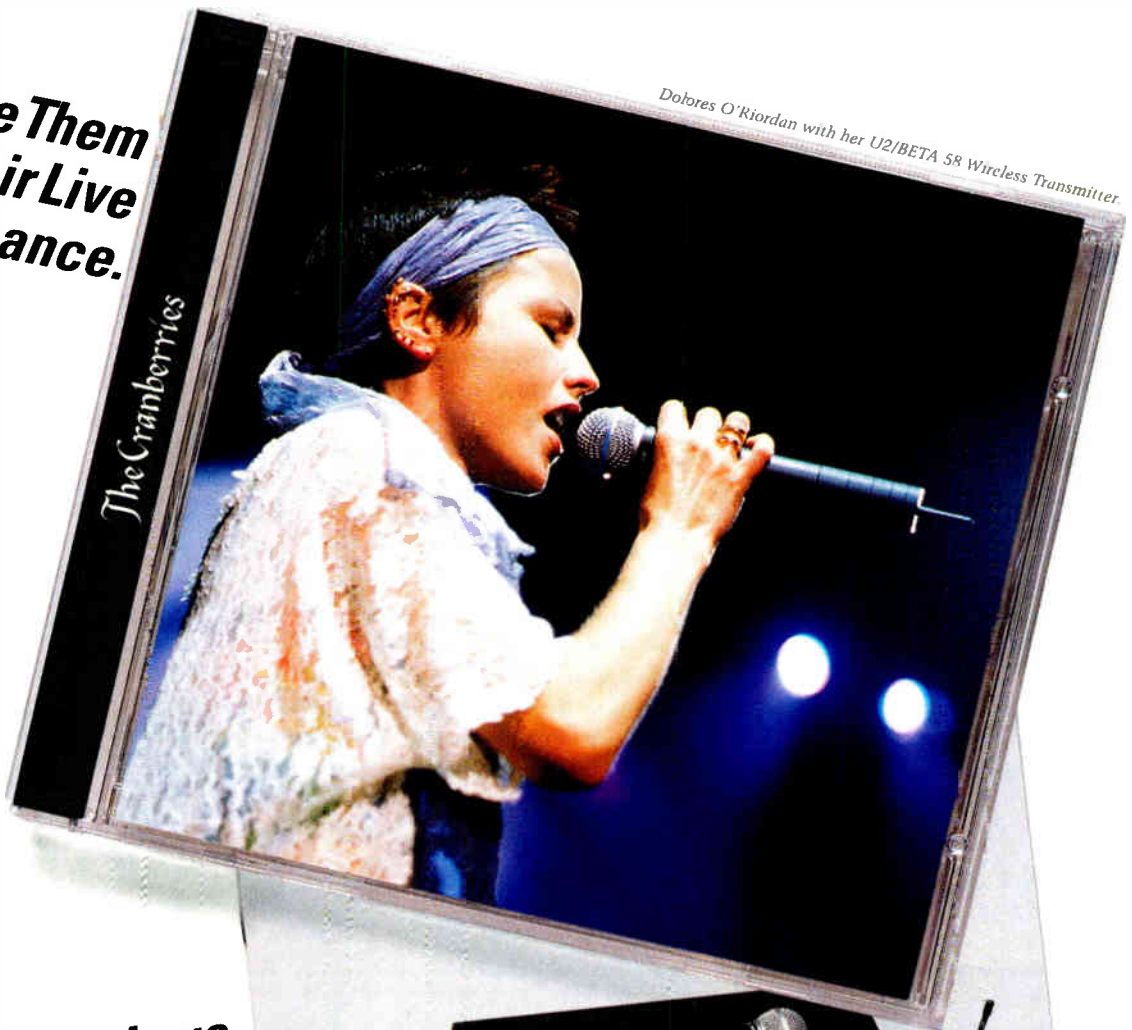
If you standardize on a -20 dBFS reference, the more compressed your musical material, the more signal-to-noise ratio you will be throwing away, at least theoretically. If your source is analog tape, you might throw away 6 or more dB of signal-to-noise ratio on the digital recorder, but this loss will be almost inaudible compared to the convenience of never having to adjust dubbing levels on equipment. Loudnesswise, most ana-

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log-to-digital dubs will sound just fine, even if they peak to -6 dBFS. (Remember, analog tapes typically sound 6 dB louder than digital tapes, given the same peak level.)

A -20 reference is only a potential problem when dubbing from digital to analog tape. In many cases, you can accept the innocuous 6dB compression. We've been enjoying that for years when we mixed from VU-equipped console direct to analog tape. When making dubs to analog for archival purposes, choose a custom reference point (-14 to -18 dBFS), as the goal is to preserve transients for the enjoyment of future listeners. A calibrated peak level meter on the analog machine will tell you what it's doing more than a VU meter. For archival purposes, I prefer to use the headroom of the new high-output tapes for transient clarity, rather than to jack up the flux level for a better signal-to-hiss ratio.

Broadcast facilities are a special case. They are interested in maximizing signal level, and in addition, they rarely see uncompressed material. For the broadcast dubbing room, -14 is a good

number (dubbing between analog and digital tapes). -18 is a safe all-around reference for all the other A/D/A converters in the broadcast complex, since most of the material will have an 18dB or lower peak-to-average ratio, and occasional clipping may be tolerated.

In the digital studio, there's only one alternative to this "reference level" mis-asma. Get rid of the VU meter entirely. Place digital meters on the recording console instead. Now, that avoids translation problems nicely!


RECOMMENDED STANDARDS FOR MASTERING STUDIOS

Mastering engineers are a little like archive engineers. They are usually interested in maximizing peak digital level on the final master. So there is never a single mastering standard; each dub has a custom transfer gain. When transferring from analog to 20-bit digital tape or to a 20-bit DAW, it is not as necessary to peak at 0 dB, because the 20-bit medium has sufficient dynamic range. If you don't hit 0 dBFS on the 20-bit, raising the gain a few dB during conversion to 16-bit is not a serious compromise, because the noise level of the 20-bit medium is considerably below that of the 16-bit.

CONCLUSION

The introduction of digital recording complicates the practice of studio level calibration. Digital recording also presents some surprising new sources of distortion and reveals fundamental defects in the design of our analog recording consoles. The average loudness of compact discs within similar genres of music varies much more than that of LPs or cassettes ever did, and consumers suffer. Recent events in the loudness Olympics (which no one can win) have created monster CDs that are 6 or more dB louder than anything previously recorded. Being competitive about loudness only creates a disservice to the consumer and actually reduces the quality of our sound. I've identified several problems and suggested solutions to them all. Let's try to be more level-headed. ■

Bob Katz recorded virtually every Chesky record and has engineered or mastered hundreds of CDs. His New York-based company, Digital Domain, offers mastering and CD/CD-ROM replication services, and manufactures digital audio hardware. Visit www.digi-do.com.




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World Radio History

PREVIEW

BENSON STUDIOSTAT 8.2

The Studiostat® 8.2 from Benson Audio Labs (Hoffman Estates, IL) is a near-field speaker with an 8-inch woofer and a 5-inch square electrostatic tweeter. Frequency response is 48 to 19k Hz ± 3 dB, and power handling is 200 watts. A front panel LED light pipe indicates power on for the electrostatic tweeter and acts as an optical guide to best listening position, which is critical due to the tweeter's narrow coverage pattern. The ported hardwood/MDF cabinet is 17.75x11x12 inches and weighs 34 lbs. A rear panel switch offers 2 dB of boost or cut to the HF response. Price is \$1,399 a pair.

Circle 226 on Reader Service Card

FOSTEX HARD DISK RECORDER/MIXER

Fostex Corporation of America (Norwalk, CA) introduces the DMT-8VL hard disk digital multitrack recording/editing system. The self-contained mixer/recorder offers eight tracks of uncompressed CD-quality digital audio and includes 18-bit A/D converters and 20-bit DACs. Each input strip fea-



tures two-band EQ, aux send, stereo in-line monitor section and an 80mm fader. The DMT-8VL handles eight additional line inputs plus two stereo aux returns at mixdown, for a total of 20 mix inputs. A large fluorescent display offers status information; recording and editing operations are managed from a dedicated control surface and shuttle wheel. Price is \$1,295.

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SSL G+ SPECIAL EDITION CONSOLE

Solid State Logic (U.S. offices are in NYC) has introduced the G+ Special Edition recording console in 48-, 56- and 64-channel frame sizes. Based on the popular SL 4000 console, the G+ Special Edition is supplied with Ulti-

mation™ and Total Recall™ features as standard and offers both stereo and multi-channel mix functionality, with full LCRS panning and simultaneous LCRS and stereo mix capability. Other features include discrete Left-Center-Right and LCRS panning on all channels, dual 24/48 bus routing, an additional 8 aux buses and a surround sound decoder monitor insert point.

EV KICK DRUM MIC

The Electro-Voice (Buchanan, MI) N/D868 large-diaphragm microphone is specifically designed to be placed inside the kick drum, about three inches from the beater head. The N/D868 features a highly directional pickup pattern, with response peaks at 50-60 Hz and in the upper midrange for fullness and punch, while a Memraflex™ grille protects its N-DYM® element.

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DIGITECH VOCALIST WORKSTATION

The Vocalist Workstation from DigiTech (Sandy, UT) is a 4-voice harmony effects processor able to produce up to 5-part harmony from a single voice input. Features

include pitch correction, 4-voice detuning and a Gender Bender™ mode that creates male or female tonalities. The self-contained unit has a one-octave keyboard for entering harmony key, cues or commands, and five sliders to control input, output and the relative levels of lead, harmony and reverb. Eight softkeys and a data wheel ease operation. The unit has 50 factory and 50 user-defined presets, each capable of eight variations. Retail: \$749.95.

Circle 229 on Reader Service Card

**TACTILE M4000 UPGRADE**

Tactile Technology (Buena Park, CA) offers three new additions to its M4000 automated mixing system. An M415 expander provides a control surface for up to 96 motorized input faders, allowing immediate access to gain, EQ, routing and fader functions. An M471 expanded meter bridge system (now standard with M4000C consoles) has high-res LED bar graphs and illuminated channel indicator numbers. And for users without an RGB monitor, the M481 connects the control surface to a standard TV monitor, showing all information on the control LCD) and SMPTE timecode.

Circle 230 on Reader Service Card



PREVIEW

STUDER D19M GATEWAY

The D19M GateWAY multi-format digital interface/routing system from Studer (U.S. offices are in Nashville) works with any MADI-equipped recording device to ease the routing of signals among digital multitracks via a graphical user interface running on a Windows PC. Available in 24- or 48-channel configurations, the D19M GateWAY offers 24 or 48 analog inputs with 20-bit D/A converters connected to a MADI demulti-plexer, which also provides 24 or 48 analog outputs via 23-bit D/A converters. Digital recording via the D19M GateWAY may be at 20-bit or 16-bit resolution. Eight AES/EBU I/O are standard; ADAT interface cards are optional.

Circle 231 on Reader Service Card

KRK EXPOSÉ MONITORS

KRK Systems (distributed by Group One, Farmingdale, NY) is now shipping The KRK Exposé E7 (\$2,995) and E8 (\$3,995) bi-amplified monitor systems. The phase-aligned speakers offer a frequency response of 45 to 20k Hz ± 2 dB and are characterized by low distortion and high phase coherency.

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SPIRIT POWERED MONITORS

The Absolute 4P active near-field speaker from Spirit by Soundcraft (Auburn, CA) is a bi-amplified design, with separate 100-watt amps for both the 170mm LF driver and the 25mm ferrofluid-cooled soft-dome tweeter. Amps have stepped input



level control and thermal protection. A constant-voltage active crossover includes time compensation for driver alignment and a switchable 40Hz highpass filter.

Circle 233 on Reader Service Card

WAVE MECHANICS PUREPITCH

Wave Mechanics (West Milford, NJ) announces PurePitch, said to be the world's first real-time, formant-corrected pitch shift algorithm for Digidesign's Pro Tools. PurePitch provides natural sounding pitch shifting and will be available for other DSP platforms in the future. Wave Mechanics also has a reverb algorithm available for the Soundscape hard disk recording system on the PC.

Circle 234 on Reader Service Card

VALLEY AUDIO DIGITAL DYNAMICS PROCESSOR

Galaxy Audio (Wichita, KN) has introduced the Valley Audio Model 730LT digital dynamics processor, a low-cost multiprocessor that offers digital compression and limiting, expansion, gating, de-essing and ducking, as well as controlling stereo width and serving as an interface among digital and analog equipment. All functions can be selected from an LED menu display and are controlled via knobs and buttons.

Circle 235 on Reader Service Card

CEDAR FOR WINDOWS

HHB Communications Inc. (Portland, ME), the U.S. distributor of the CEDAR product line, is now shipping CEDAR for Windows, a suite of audio restoration modules that allow complete real-time audio restoration, including de-click, de-crackle and de-hiss, in a single pass. Any process can be assigned to any module for simultaneous multitrack processing.

Circle 236 on Reader Service Card

AKAI DL16 REMOTE

Akai Professional/Digital (Fort Worth, TX) announces the DL16 remote controller



for the DR8 and DR16 Digital Disk Recorders. The DL16 provides standard transport functions, a jog/shuttle wheel, a numeric keypad and dedicated keys for all edit functions. One DL16 can control up to eight machines and a master level control, 16 faders and 16 panpots allow real-time control of level and pan. Paired with optional EQ8 or EQ16 boards, the DL16's dedicated EQ section allows for control of 16 or 32 channels of parametric EQ. Retail: \$1,795.

Circle 237 on Reader Service Card

STUDIO LOCATOR STAND

The QL-400 Studio Locator Stand from Music Industries Corp. (Floral Park, NY) holds small professional studio gear as large as 23.75x26 inches, such as au-



tolocators, mixers, drum machines, etc. Padded support arms lock equipment in place. Height adjusts from 32 to 40 inches; tilts from flat to nearly vertical. Retail is \$179.95 or \$159.95 without casters.

Circle 238 on Reader Service Card

3D AUDIO FOR THE WEB

QSound Labs (Calgary, Alberta) offers the QSound Labs IQ™ software tool 3D audio enhancement of Internet audio sources. IQ supports streaming audio plug-ins (i.e., Real Audio, Shockwave and Xing StreamWorks) and any Win-



dows playback to enhance the sound of multimedia titles, WAV files and system sounds, using QSound Labs' QXpander™ stereo-to-surround technology to provide 3D enhancement in real-time. IQ also detects mono content and automatically applies mono-to-3D processing. IQ may be downloaded from www.qsound.ca for \$14.95 (U.S.).

Circle 239 on Reader Service Card

PREVIEW

FAIRLIGHT MFX3PLUS

The MFX3plus digital audio workstation from Fairlight USA (Culver City, CA), a second-generation product with a new CPU running up to 40 times faster than the previous MFX, offers PCI bus support, and features enhanced graphics and a control surface one-third smaller. Function-specific software modules allow a cost-effective upgrade path. Priced under \$20,000, the Fairlight MFX3plus is available in four versions: standalone (desktop); 19-inch rack-mount; FAME compatible; and configured for integration with the Yamaha 02R digital mixer.

Circle 240 on Reader Service Card

POWER TECHNOLOGY ADDS TO DSP•FX FAMILY

Power Technology (Brisbane, CA) has three new additions to the DSP•FX 32-bit digital effects processing family. The FX•Pack is a 2U modular rackmount system housing up to four DSP•FX cards. The DSP•FX cards may be controlled via a graphical interface from any Mac or PC platform or via MIDI. Price is \$1,299, with one DSP•FX card. The DSP•FX AES Converter (\$599) is a standalone 20-bit



D/A conversion system with AES/EBU and S/PDIF digital I/O connections. The DSP•FX AES Interface card (\$299) attaches to any DSP•FX card for AES/EBU digital audio I/O at 24-bit precision.

Circle 241 on Reader Service Card

WAVECENTER™ DIGITAL AUDIO/MIDI CARD

The WaveCenter™ integrated digital audio and MIDI card for the PC from Frontier Design Group (Lebanon, NH) supports direct digital transfers between ADATs and PCs, enabling easy audio editing in the Windows environment. WaveCenter integrates ADAT, S/PDIF and MIDI on a single card and provides both co-ax and optical S/PDIF connections, allowing four independent clock-unified S/PDIF playback channels from one card. WaveCenter can convert between electrical and optical formats in real time and supports 16- and 24-bit audio.

Circle 242 on Reader Service Card

HOT OFF THE SHELF

Waves Ltd. announces AudioTrack™ 1.2, an Apple Macintosh plug-in providing pre-processing EQ, compression/expansion and gating for Macromedia's ShockWave Audio™ (SWA) implemented through Macromedia SoundEdit 16." Call 423/689-5395 or surf to www.waves.com...THAT Corporation's 100 series of dielectric isolation (DI) transistor arrays offer low noise, high speed and excellent matching in NPN, PNP and mixed NPN/PNP styles. Call 508/229-2500 or surf to www.thatcorp.com...Opcode Systems' Studio 64X™ a cross-platform MIDI interface/patchbay for both Macintosh and Windows, features front panel MIDI control, one-button SMPTE read/write, panic button

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International offers two new catalogs, the Broadcast Audio/Video Catalog #963 for co-ax and audio cables, and the Custom Products Catalog for multicore cables and adapters. To order, call 312/733-9555...Signal Transport introduces Project Patch TRS™, a low-cost ¼-inch, 48-point "plug and play" patchbay wiring system. Call 510/528-6039...

DataTel Corporation, a new division of Middle Atlantic Products, announces a line of 19-inch Pivoting Panel Mount (PPM) racks equipped with a pivoting hinge system to ease frontal access. Six models are available in 2U, 4U, 6U and 8U sizes and six-, twelve- and eighteen-inch depths. Prices start at \$50. Call 201/616-7078...Tomorrow's Research Today's Tubistor™ is a better sounding replacement for all solid state devices, including transistors, FETs, IC, LSI and DAC chips, diodes, rectifiers and regulators. The Tubistor acts physically and electrically like a solid state device, but sounds like a tube circuit. Call 619/724-8999...Ac-cetera's FILTER-EZE pop filter is available in two models. The \$36.95 version has a clamp and a 12-inch extension arm; the \$18.95 model threads onto any standard mic stand. Ac-Cetera has also reduced the price of its X Series RUB-BER-NECK gooseneck mic adapter. Call 800/537-3491...Selco Products Co. delivers custom meter dials at low cost and within four to six weeks. Eight basic

meter types are available in several variations. Selco provides printer's artwork, and customers may specify any number of colors. Call 714/521-8673...New Sensor Corporation has reissued the Electro-Harmonix Deluxe Memory Man echo/chorus/vibrato analog delay stomp box. Call 800/633-5477...The 1997 Zero Catalog from Ribaud Company is a 36-page color catalog with schematics and specs for its specialized sealing systems for doors and windows. For a catalog call 201/467-7878...BASF ships ¼-inch and ½-inch splicing tape and polyester based leader tape in ¼-, ½- and 2-inch sizes. Call 800/225-4350 or 617/271-4000...The Music Bakery has expanded its growing library of buy-out production music with *Orchestral Power*; *Technology*; *Dramatic Action*; *Way-Cool Tracks*; and *Percussion!* Each CD is encoded for use with AirWork Media's TuneBuilder self-editing music software. Call 800/229-0313 or visit www.musicbakery.com...Per Madsen Design adds three new 19-inch equipment racks with mounting rails to the RACKIT™ System 19 line of stackable equipment and media storage units. Available in 5U, 8U and 16U sizes, the open racks are made of solid oak and feature high-quality, heavy duty steel rails. Call 415/822-4883...Sescom's 1997 MI-Series Audio Transformers catalog describes 59 different transformers and is available free. Call 702/565-3400 or e-mail to sescom@anv.net.

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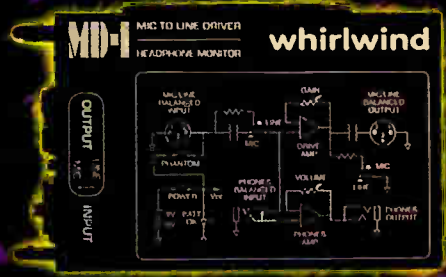
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L.R. BAGGS PARA ACOUSTIC DI

DIRECT BOX, EQ, GUITAR PREAMP

The L.R. Baggs Para Acoustic DI combines an active direct box, a semiparametric equalizer and an acoustic guitar preamp—all in a compact, rugged, steel chassis. And it can run on phantom power. Built by self-proclaimed audiophiles for performers of the same ilk, this little wonder crosses boundaries and redefines the product category; new users will come to expect similar features in future devices of this type. The Para DI is the perfect gift for serious acoustic guitar players, and live sound engineers will cheer when any visiting troubadour pulls one out of his or her gig sack. For singer/songwriters and solo folkies venturing out on the coffeehouse and support-act circuit, this little accessory joins the list of necessities that includes a sleeping bag, a spare E-string and a Rand-McNally.

A couple of years ago, Lloyd Baggs' acoustic pickup company revolutionized the sound of a plugged-in acoustic guitar by introducing the Ribbon Transducer, which can now be ordered as a factory-installed system on many production and custom guitars. L.R. Baggs' now-familiar brown acoustic preamp equalizer has four slider controls (Volume, Bass, Midrange and Treble). Plugging the unit into a direct box converts its output into a balanced signal that can drive low-impedance XLR lines found in professional P.A.s at even modest-size venues. The Para DI combines all of these functions in a single product.

About the size of a standard active direct box, the Para DI weighs just under a pound. I/O connections include two ¼-inch (loop-through) jacks, an XLR and a ¼-inch insert jack for external effects. Like the inserts found on many consoles, this RTS jack is wired so that the tip sends the signal and the ring returns it. Used with a stereo Y-cable, it can be used to insert any effect into the

Para DI, pre-EQ. A phase-reverse switch, labeled Invert, changes the polarity of the output signal, a particularly useful feature when direct and miked signals are summed. In the absence of between 30 and 50 volts of phantom



PHOTO: MARK FRINK

power from a mixing board, the Para DI automatically switches to its single 9-volt battery. The battery lasts for over 200 hours, and a slide-in battery compartment allows replacement in seconds, no tools required. A red LED, activated when a ¼-inch jack is plugged into the input, indicates that the unit is on; a green LED indicates phantom power.

Of the five tone controls on the Para DI, two are sweepable over a range of mid-frequencies. Typical of most treble tone controls, the Treble shelving filter is at 10 kHz, right where you'd expect it to be. A Presence control is an octave below that at 5 kHz and gently boosts or cuts the uppermost two octaves of the midrange, where an acoustic guitar's harmonics occur. Used in conjunction with the Treble control, Presence allows the user to craft a very natural top-end sound from most pickups.

The Midrange control, also

about two octaves wide, has a center frequency adjustable from as low as 400 Hz all the way up to 1,600 Hz. This flexibility can be used to correct the tone of a mediocre pickup, making it less boxy or warmer as needed. The Midrange control can also be used to boost the signal in monitor systems at frequencies around the crossover point, which is often "carved out" to control vocal mic feedback, a technique that may leave a hole in the response, making it difficult to hear the instrument's middle tones. Similarly, the Presence control can be used to restore 5 kHz in monitors that have been EQ'd for sibilant vocal mics.

The Low EQ is a shelving filter fixed at 85 Hz, which can be helpful when EQ'ing for percussive styles of playing (such as slamming the heel of the palm on the guitar body) and can add warmth for gentle picking styles. There is also a nonadjustable 12dB-per-octave highpass filter at 35 Hz, designed to cut down on nonmusical, mechanical thumping and bumping.

Finally, there is one more EQ control called Notch, a narrow low-mid tone control. At an octave wide, Notch is only half the width of the Mid and Presence controls and is intended to in-

BY MARK FRINK

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crease gain-before-feedback by allowing the user to adjust it to the resonant frequency of the guitar. For convenience, it is labeled in note-values from G-2 up to B-3, corresponding roughly to 100 to 250 Hz. The Notch control can also be used to great effect to fatten low end while using the Low Shelf control as a rumble filter.

In single-console sound systems, monitor mixes are typically sent from the mixing board using pre-fader, pre-EQ auxiliary sends—levels are not affected by changes to the main mix or by EQ changes. The tone of the monitors is often controlled via a single graphic equalizer. When that graphic is used to reduce frequencies at which the vocal mic feeds back, those same frequencies are cut in all other signals heard in the monitors, including the acoustic guitar. Conversely, if the EQ is used to make an acoustic instrument sound better, the vocal mics will be affected, usually adversely. So, in single-console systems the graphic is primarily used for control of vocal mics, since they have no other tone control.

In such situations, flexible dedicated tone controls for acoustic instruments are nearly indispensable. After the monitors have been optimized for the vocal mic with the graphic, the Para DI's comprehensive tone controls can be used to get the guitar sounding right, however peculiar the monitor response. One suggestion for sophisticated acoustic performers is the use of an A/B switch to go back and forth between two Para DIs for picking and strumming styles. This setup allows the tone and level for each style to be set correctly at soundcheck and frees the house engineer from responsibility for switching between them.

I used the Para DI at the Fifth Annual Singer/Songwriter Retreat on Martha's Vineyard last fall, on dozens of different acoustic guitars. Many guitars (and guitarists) were helped by parametric adjustments that would not have been possible using other pre-amp and DI combinations. The Para DI's design has been carefully thought out and is obviously the product of many years of involvement with acoustic guitars. With a list price of only \$198, it's like getting a free pre-amp and equalizer for the price of an active DI. I recommend it highly.

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World Radio History

CRANE SONG STC-8

DISCRETE CLASS A STEREO COMPRESSOR/PEAK LIMITER

Having walked around the recent AES convention in Los Angeles, I know that the retro audio craze is still going strong. Outboard processors with huge knobs, dials and meters—often attached to brightly colored cases—were everywhere. At times, I wondered if I hadn't taken a wrong turn someplace and stumbled onto the set of a '50s sci-fi movie.

The Digital Age brought us nostalgia for the "good ol' days" of tube distortion and analog tape saturation, and plenty of folks have created products catering to that craving. Most of these devices employ either tubes or ICs combined with some sort of special tube or optical emulation circuitry, and many of them are designed to sound like specific "vintage" processors. But there is at least one new company that has taken a different approach, and the result is an exceptional compressor/peak limiter that doesn't really sound like anything else. However, if you just have to add a little distortion to warm up your cool digital tracks, it has a switch for that, too.

The Crane Song STC-8 Discrete Class A Stereo Compressor/Peak Limiter is the flagship release from Crane Song Limited, a new company founded by David Hill, formerly of Summit Audio. As its name implies, the STC-8 uses discrete Class A circuitry rather than tubes or ICs. This makes for a much cleaner audio path, because there are no VCA or optical gain control elements.

The STC-8 operates in true stereo, or as discrete independent mono processors. The sidechain allows both compression and limiting simultaneously, using the same proprietary gain-control circuit. The STC-8 also has a special circuit that changes the induced distortion created by high compression ratios and fast release times into a more



"musical" form. Its KI mode (which was named by a yoga teacher who operates out of the same building as Crane Song) converts the unmusical third order harmonics into second order harmonics, which are more pleasing to the ear. The manual states that the STC-8 is the only compressor on the market with this capability, but I know of at least one other that makes the same claim (see the Empirical Labs EL-8 Distressor Field Test in December 1996 *Mix*).

Although the STC-8 sports an abundance of little green knobs, it is otherwise very contemporary in its appearance. The unit has a brushed aluminum face with two slim LED meters, five small black toggle switches and 16 knobs. It measures two rackspaces high and a little over 12 inches deep. There are transformerless, balanced XLR connections for I/O, and a DB-15 connector for access to the compressor side chain.

On the front panel (and at various points in the manual), the two sides are referred to as Left and Right, while on the rear (and at other places in the manual) they are referred to as 1 and 2. This anomaly presents no real practical difficulty, but it should be noted. In addition to the usual Attack, Release, Threshold and Gain controls, there is a control called Shape, which changes the gain curve. When it is set to zero, the slope and curve are gentle, and as you approach ten the curve becomes more aggressive and the slope becomes higher. There is also a Peak Threshold control, which determines the

point at which the limiter engages. The Bypass switch takes the compressor completely out of the audio path, which is quite useful for A/B comparisons, but like almost every other com-

pressor bypass switch I've encountered, it makes a very nasty pop when engaged.

The learning curve for this device does not have a particularly soft knee. Although there are "presets" for some more common applications, in reality they are only slightly less complex than the non-preset options. The primary reason for this is the tremendous amount of flexibility that the interaction of the various controls provides, and the fact that there are few fixed values and parameters for those controls.

For example, the Attack, Release, Threshold, Shape and Gain controls are all simply numbered zero through ten. The actual attack/release times, compression ratios, knee curves, etc. depend on numerous variables, including whether or not special automation circuits such as Program Dependent Release are engaged. In order to know what the release time for a particular preset is, you have to memorize the range of values given in the manual and then calculate the approximate time based on the settings of several other controls.

The arrangement of the various controls, and even the way they are designated, can also be confusing, at least at first. On the other hand, I found that once I had familiarized myself with all of the settings, the very complexity that initially had been so foreboding became the flexibility that allowed me to find creative solutions to a wide variety of problems.

AT THE CONTROLS

At the heart of the STC-8 is the Pre-

BY BARRY CLEVELAND

set switch, which has 16 different settings. These settings allow for all of the possible combinations of three basic presets (A, B and C), a variable setting (V) and two types of special automation circuitry (Program Dependent Release and Dynamic Attack Modification). In other words, there are four subgroups, each of which contains an A, B, C and V setting. The four subgroups are 1) Program Dependent Release with Attack Modification; 2) Program Dependent Release without Attack Modification; 3) Regular Release with Dynamic Attack Modification; 4) Regular Release without Dynamic Attack Modification.

The three types of presets are for vocals (A), bass (B) and program averaging/volume control (C). When any of these presets is engaged, the Attack, Release and Shape controls on the front panel are not operational; when the variable setting (V) is engaged, they are.

The STC-8 has three special circuits that give it its distinct personality: Program Dependent Release (PDR), Dynamic Attack Modification and the KI mode. Program Dependent Release may be thought of as auto-release: It continuously adjusts the release time of the compressor in order to compensate for changes in the program material. It was designed for use in applications where it is desirable to level the volume without bringing up background noise, such as recording voice-overs and vocals, where headphone bleed and room noise can create problems. It also helps to suppress things like acoustic guitar finger noises, woodwind valve and pad sounds, etc. Dynamic Attack Modification, or A-Mod, allows the peak limiter to dynamically adjust the attack time of the compressor. This is useful when a longer attack time is selected, but there are transient peaks that trigger the limiter and you want to maintain overload protection. It also allows for quick control of audio after a period of silence. The KI mode adds warmth and color by modifying the audio path and the sidechain. Its effect is modified by the Attack, Release and Shape controls. A switch toggles between the KI mode and the HARA (also named by the yoga teacher), or clean mode.

PERFORMANCE

The STC-8 was designed to provide overload protection for digital recording and broadcast transmitters, and transparent gain control for program material and individual instruments, as well as emulating vintage equipment and facilitating

the creation of distinctive new sounds. In general, I found the STC-8 to be amazingly quiet—not surprising, given its -88dBm noise floor (measured 20 to 20k Hz) and its 5 to 20k Hz frequency response—and smooth in its operation. It was nearly impossible to choke it, or make it pump or breathe, even while processing bass and other low-frequency sounds, using very fast release times and high compression ratios. It provides transparent gain reduction and peak limiting in all but the most extreme settings, and even then the coloration of the sound was often useful.

The voice and bass presets were usually at least in the ballpark, though in many cases I preferred to try my luck with the Variable settings instead. While using the presets, I often found the difference between the PDR and the regular release settings so subtle as to be hardly noticeable. The PDR was more evident while using the Variable setting, particularly on woodwinds, acoustic guitars and some percussion instruments. It was also quite useful on program material that had a wide dynamic range and/or lots of stops and starts. The KI mode was also often difficult to detect, though ironically, it seemed more apparent on distorted sounds like overdriven guitars and basses, and to a lesser extent on percussion instruments with sharp attacks, such as talking drums and claves. The Dynamic Attack Modification did exactly what it was supposed to do, and the transition from the peak limiter back to the compressor was nearly undetectable.

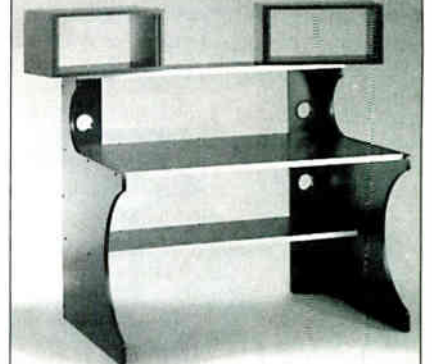
Processors that use Class A circuitry do not come cheap, but in the case of the STC-8's \$3,250 retail, you definitely get what you pay for. It does not sound like any tube or solid-state compressor/limiter that I have ever heard. In fact, it is what it doesn't sound like that makes it special. If you are looking for a nasty-sounding monster-masher that will make electric guitars shred walls at 50 paces, then this is probably not the unit for you. But if you are looking for an extremely quiet and transparent dynamics processor that is versatile enough to squash most signals cleanly and musically, and also provide master-quality leveling and overload protection, you should give the Crane Song STC-8 a serious listen.

Crane Song Ltd., 2117 E. 5th St., Superior, WI 54880; 715/398-3627; fax 715/398-3279. ■

Barry Cleveland is a San Francisco-based engineer/producer and composer.



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The Alesis NanoVerb is a great-sounding, high-quality effects processor that fits in the palm of your hand. Three of them can fit into a single rackspace. Perfect for the space-conscious home recordist, it could sit on top of a monitor while you're mixing. It is also useful for live sound reinforcement; you can place it on top of your rig, mixer, keyboard, monitor, etc. When the gig is over, stuff it in your bag and you're ready to go.

When you first hook up the NanoVerb, you can't help but notice how quiet the unit is. NanoVerb's 18-bit processor is noticeably quieter than that of any 16-bit counterparts that are out there. We began listening to the effects using the recommended level settings listed in the manual. The unit input was set at 75%; the Mix setting was set full, while the output was set as the input, 75%. I recommend staying below these levels,

carry a Leslie speaker around to a small club today. As a blues organist, I was interested in how the NanoVerb's Rotary setting would work with a factory preset Korg M1 organ patch. With the M1 patched directly in the mixer to demo the effect, it sounded pretty good. Using the Adjust knob, I could control the speed and harmonics of the "Leslie." This ability to reasonably—and quite easily—emulate blues or gutsy rock organ was cool. I also



NanoVerb's top-quality algorithms and new 18-bit converters combine to create a great-sounding digital effects unit. At \$179, it is also clearly one of the least expensive. The NanoVerb is packed full of useful effects: three halls, three rooms, three plates, two chorus rooms, delay, flange, chorus, non-linear and rotary-speaker simulation. I really liked the "dial-an-effect" aspect of this unit, where you have a rotary knob to dial up the preset effect and a separate control knob for each of the input, output and mix levels. There's also an adjustment knob to control the overall effect parameter and an in/out bypass footswitch jack on the rear panel.

Working with my songwriting partner, Todd Corleto, in our project studio, I demo'd each parameter suggestion listed on the program chart supplied with the unit. We tested the unit using a Fender Strat guitar, Korg M1 synth and an E-mu Proteus FX sound module drum patch triggered by a Daz electronic drum pad, all patched directly into a Tascam 2516 mixer.

because instrument signal noise was significantly more noticeable after the 75% threshold. Though we did crank it up occasionally to test the audible noise on each effect, the NanoVerb was still quieter than many units I've heard.

Generally, the unit sounded superb, especially on guitar and synth. And though there are tremendous differences between a sampled snare, and a close-miked "live" snare with good condenser mic, the sound shaping for both is somewhat similar. In the case of the sampled snare, the NanoVerb's Nonlinear and Hall settings were very effective on the dry drum sounds we triggered. The chorus setting gave ample rate and depth control and did a good job with flanging and delaying. Chorus Room 2 was a highlight, as it really provided depth with funk guitar picking.

My favorite effect was the unit's rotary-speaker emulation. Most keyboardists would not venture to

demo'd the unit with the same M1 sound at a rehearsal with Zakiya Hooker's (John Lee Hooker's daughter) blues band. The bandmembers liked it and favorably compared the effect to a real Leslie.

At a retail price of \$179, you shouldn't expect NanoVerb to offer a lot of bells and whistles. The NanoVerb is a practical, everyday effects processor. So, if your audio needs include multi-effects processing, balanced +4 dB connections, digital I/O, EQ or MIDI control, NanoVerb is not for you. However, if you need a true stereo effects processor that's simple to operate, compact, reasonably priced and ideal in a variety of studio and sound reinforcement applications, you should check out the Alesis NanoVerb.

Alesis Corporation, 3630 Holdredge Avenue, Los Angeles, CA 90016; 800/5-ALESIS; e-mail: alecorp@alesis1.usa.com. ■

Chris Patton is a composer, arranger and producer based in the San Francisco area.

BY CHRISTOPHER PATTON

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Exhibit A

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Real-time BW	102.4 kHz 12.8 kHz
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TOURING LOUDSPEAKERS

MORE FOR LESS

[Editor's Note: In this issue, sound reinforcement editor Mark Frink begins a new role as columnist, providing commentary and insights into issues affecting the live sound industry. Mark will continue to cover trade shows, report on tours and review new products, and we expect his new position as ombudsman/gadfly for the industry to generate discussion, pro and con, concerning the day-to-day life of sound reinforcement professionals. As always, your comments and suggestions are welcome.]

I kept just inside the back of the truck to stay out of the rain as the main speakers began to roll out of the Orpheum. With one foot on the lift gate lever, I shouted encouragement to the loaders, while my partner pushed the gear lined up at the door toward the truck. Our day had begun 16 hours earlier at the shop, where we had assembled the 40-channel system from the specs in a two-page fax, yet we still had a hundred-mile drive ahead of us. After subtracting trucking expense and our labor, the sound company's take for the night was less than \$1,000, a fraction of one percent of the equipment's value.

The year was 1987, and since then competition has kept the asking price for sound services about the same. In general, the cost of tour-capable sound equipment has increased over the past decade, yet it is rare that today's clients pay more than they would have for a comparable system ten years ago. Sound companies now face esca-

lating demands within a pricing structure that may appear to have remained constant, but in real, inflation-adjusted dollars has actually declined. Artists' engineers clamor for more equipment, while accelerated obsolescence shortens the useful life of the most expensive components. Year after year, promoters budget the same round, slim numbers for sound, regardless of the show's technical requirements, confident that they can play several vendors against each other should push come to shove. Sound companies are required to provide More For Less because that's what the market will bear.

As we embark upon another

season behind the wheel, I humbly offer several modest remedies (and a few revelations) that may help protect the beleaguered sound system operator from the economic forces that make it harder to turn a profit each year. As we turn our thoughts toward speakers this month, my theme is Less Is More.

SPREAD 'EM

How about one less speaker? The same angle of horizontal coverage—and better sound—can often be achieved with one less speaker in the row. Array-ability, a marketing buzz word you won't find in many audio texts, promises that coherent arrays can be easily constructed from individual enclosures.

—CONTINUED ON PAGE 162

BY MARK FRINK

TOUR PROFILE

REBA MCENTIRE

Queen of Country Performs in the Round

Named the top-grossing country touring act for the past two years, Reba McEntire puts on what is likely country music's most lavish road show. McEntire's ensemble includes ten dancers and 11 bandmembers, plus guest star Linda Davis and opening act Billy Dean and his band. The highly theatrical production also offers elaborate sets, costume changes and special effects. The immense rig—40 tons of equipment traveling on 17 trucks—requires the support of 60-plus crew members and, for arena shows, an additional 100 local stage hands.

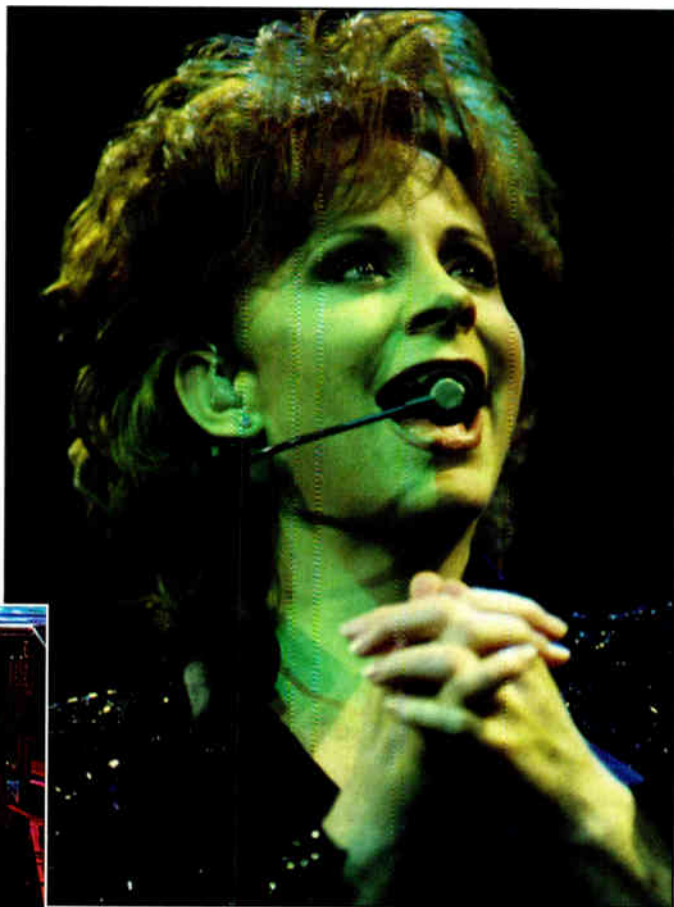
Two weeks after the release of her 26th album, *What if It's You*, *Mix* caught up with the Reba McEntire tour at the San Jose Arena. The December 12 show was the first night back onstage for McEntire since she broke her knee in a skiing accident, so many of the dance numbers were scaled down, and McEntire opted not to arrive onstage in her jet. Though the show was a little less spectacular than usual, the crowd was treated to a low-key, personal performance.

In fact, the stage design is well-suited for an intimate show. At the San Jose Arena, a low platform stretched the length of



**Left: FOH engineer
Ricky Moeller**
**Above: monitor mixer
Robert "Koz" Kosloskie**

the arena floor, offering three performance spaces connected by a wide walkway, with a pit in the middle for the band. Apparently, this is the first Reba McEntire tour to be set up "in the round." "We've done a lot of round theaters where the band was in the pit, but that was in the old days when we just used to bring in our front end and patch into whatever amplifiers they had," says front-of-house engineer Ricky Moeller. Moeller has spent the past 23 years on the road as a sound engineer, and 13 of those years working with McEntire's Starstruck Entertainment organization. Moeller is also involved in Nashville studio work and audio post for television—Fritos commercials are among his recording credits. He's currently mixing on a vintage 52-input Harrison console, which he feels sonically



PHOTOS: STEVE JENNINGS

and EQ-wise, is still one of the better desks available. "Until they give me a digital automated console that's cost-effective, I'll do it the old way," he says.

"Basically, we approach the live performance as we would mixdown in a studio; it's just a bigger control room," explains Moeller. "[For] the imaging that we have going on, we approach all of our signal processing just like we would in a studio." Processing gear includes plenty of tube compressors and parametric equalizers; he's also using a Lexicon PCM 70 for reverb, an Eventide H3000 for vocal doubling and delays, and Drawmer gates and limiters. "We're not frightened by room acoustics or anything like that," explains Moeller, "because we feel like we have the gear and the crew to be able to adapt to any environment."

McEntire's vocal runs through the Harrison mic pre-amp and parametric on her vocal channel, as well as through a GML parametric and a TLA 100A Summit tube line leveling amplifier. "She has a real dynamic voice, so [the TLA 100A] kind of pulls up her

BY SARAH JONES

—CONTINUED ON PAGE 170

TOUR PROFILE

BOB DYLAN

Headin' for Another Joint



PHOTO: STEVE JENNINGS

Bob Dylan ended 1996 with a cross-country tour that began in San Luis Obispo, Calif., and spiraled through America's heartland. Ed Wynne has been mixing Dylan for a decade (with the exception of a stint with John Mellencamp in 1988) and requested a V-DOSC system from Cox Audio Engineering (Los Angeles). Dylan's sound company, Electrotec Productions (Westlake Village, Calif.), duly supplied Wynne with North America's first touring V-DOSC system and provided Electrotec crew chief and V-DOSC engineer Michael "Dr. Geese" Graphix.

The V-DOSC cabinets hang in a column, each forming a horizontal "slice" of a line array. "I've understood the concept behind the technology for a long time," Wynne explains. "The same philosophy was behind the Grateful Dead's Alembic system; that stacked up in columns, and this is a refinement that couples up into the high frequencies."

The front baffle of each V-DOSC enclosure is almost entirely transducer. In any speaker array, components can't couple above frequencies whose wavelengths are shorter than the distance between their acoustical centers. Though

coupling of lower frequencies commonly occurs, high-frequency coupling in traditional arrays is not possible because of the size and shape of their horns; this results in comb-filtering over most of the listening area, except right up front where only one box is heard.

With V-DOSC, coupling is extended to the highest frequencies, and the near-field listening area extends far into the audience. "You always mix in the near-field, rather than the reverberant field," Wynne notes. "It doesn't get noticeably quieter as you get farther away." A coherent line array generates a sound field where SPL decreases proportionally to distance, rather than the square of the distance. "At the Amphitheater in Mesa, Arizona, we had the house dB officer quite amazed," Graphix



PHOTO: RUDY ARNAS

Ed "Coach" Wynne, mixer for Bob Dylan (l) and Jeffery Cox, president of Cox Audio Engineering

adds. "He measured 6 dB less at the back of the house than at the seat in front of the P.A." Because of this low rate of attenuation, a large portion of the audience is sitting in the stereo near-field.

Horizontal coverage is 90 degrees, and the array is "bent" vertically to open the narrow 5-degree vertical dispersion of a straight array to match the coverage area. "V-DOSC software allows me to measure the coverage area and configure the system for the number of boxes, giving me a diagram for the coverage angles of each enclosure," Graphix explains. In addition to the improved sound quality from the absence of combing, sound energy is not spilled on the ceiling and walls, and the effect of the room is reduced, improving the sound further. "Coverage is so tight that you're out of the pattern within a couple of seats horizontally or a row vertically," Wynne comments. "You hit the top seat in the house and not the ceiling. V-DOSC also alleviates much of the problem from mixing under the balcony."

The Dylan tour was mainly

—CONTINUED ON PAGE 176

BY MARK FRINK

TIPITINA'S, NEW ORLEANS



PHOTO: BRUCE ROBERT DUFFDALE

Club production manager Eddie Pearce atop the PM3500.

Tipitina's, located on Napoleon Avenue in New Orleans, is the birthplace of much of the original music to come out of the Crescent City. While there are many popular attractions in New Orleans, this landmark roadhouse is where locals have come to hear the Neville Brothers, Dr. John, Harry Connick, Jr., and The Radiators over the past two decades. The bronze bust of Professor Longhair in the foyer features a shining pate, polished to a high sheen by patrons rubbing it for good luck.

In fall 1996 Tipitina's underwent a much-needed facelift, and a complete replacement of the 684-capacity club's sound system was included in the renovation. The historic club's renewal can be traced to the involvement of an investor group represented by Roland von Kurnatowski. The group's interest in making this legendary club shine has literally brought it back from the brink of disaster. The notorious dressing rooms have been completely rebuilt, the interior refurbished and the walls decorated with hundreds of posters from previous shows.

The new sound system was designed by Chris Brown of Sound Chek Music of Metairie, La., and installed under his supervision over three days last fall. Production manager Eddie "the Elf" Pearce, who had been working with Louisiana's own Cowboy Mouth, was enticed off the road and is assisted by Brent Morelan and ten-year Tipitina's veteran Tyrone Powell.

The FOH console is a 44-channel Yamaha PM3500 with four stereo channels; three SPX-990s and a Roland SDE-330 delay are available for effects. "We wanted a system that everyone would instantly be comfortable using," Pearce

comments, though the mix position is easily covered, allowing acts that carry their own consoles to place their board on top. Outboard equipment includes a pair of dbx 1046 quad gates and eight channels of dbx 172 SuperGate. The main EQ is a Klark-Teknik DN-3600 stereo programmable equalizer. "We're able to store different curves for different bands on the same evening," notes Pearce. "Then when bands return, I can recall their previous curve, more importantly the curve from the end of the night."

Tipitina's is the first live music club in the U.S. to install a Turbosound Floodlight system. The main speakers are the "skeleton-version" without the enclosure, and these four TFL-760HS Floodlights are supplemented by four TSW-718i double-18 lows. The Turbosound LMS-700 controller is equipped with a meteorological probe. "This being Louisiana, you never know what the temperature and humidity are going to be," Pearce notes with a grin. "The probe helps keep things on an even keel, particularly in regard to the high frequency EQ and delay." A separate BSS FDS-360 crossover is used for four additional Turbosound 21-inch subs. "The system can easily handle anything from reggae to jazz," Pearce says.

The system is powered by a Carver PT-1800 for the mids, Carver PT-1250 amps for high-mids and highs, and QSC EX-4000 amps on the lows and subs. The amps are located in a separate, air-conditioned room backstage where the audio equipment is stowed. In addition to mic stands neatly hung on the wall, there is a well-rounded mic collection. Along with the usual assortment of Shure SM58s, 57s and

BY MARK FRINK

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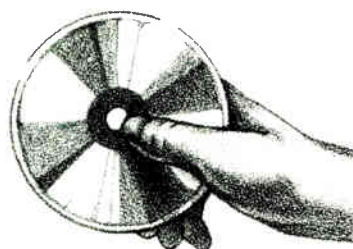
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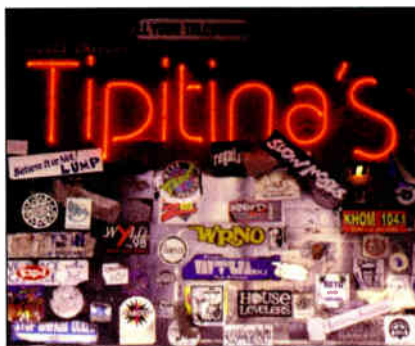
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Sennheiser 421 dynamics, there is an Electro-Voice RE-20 and a couple of AKG D-112s. Condenser mics include three Shure SM94s, four AKG C-418 clip-on mics and four AKG C-1000s.

A Yamaha PM3500M was purchased for the stage, with the rest of the 8-mix monitor system provided by Flagg Systems. For bigger shows, Sound Chek has an 8-mix Clair Brothers system that the club rents occasionally. The system is meticulously cabled with products manufactured by ProCo, including direct boxes and the custom splitter system. "The 40-channel split has ground lifts on every channel," Pearce points out, "and there's a third split on a ten-foot fan-out for recording and broadcasting mixes, which we do all the time." Pearce was able to link the two consoles' mute functions by sending MIDI down one of the return lines in the snake, allowing the FOH engineer to mute sections of the monitor board remotely from FOH.



Tipitina's is the newest member of the new Macintosh Music Network. Among the dozen or so other showcase venues on the network are San Francisco's Warfield Theater and Fillmore Auditorium, the Fox Theater in Boulder, Colo. and the Strand in Providence, R.I. A stereo feed taken direct from the board is sweetened, treated and broadcast onto the net from Apple's production center in Cupertino using both Real Audio and Audio Active. Cameras are operated remotely, and there are plans to remotely control separate mix consoles in the future. The network is a result of Apple's involvement with the New Music Seminar, revived as the Apple New York Music Festival. Both Macintosh and Windows-based net-surfers can get online at live.apple.com to see and hear a live Web-cast hosted by an "internet jockey," participate in a chat room, look at schedules and even purchase tickets.

—FROM PAGE 158, TOURING LOUDSPEAKERS

But many popular trapezoidal designs incorporate side angles that may not relate to the horizontal coverage pattern. While the trapezoidal footprint has taught many sound engineers to bend a row of speakers, too many simply accept the manufacturers' side angles as the only solution for constructing an arc. In fact, leaving a space between each cabinet at the front can often reduce high-frequency interference where coverage overlaps, as well as break up midrange coupling from combined arrays that can color the single-enclosure response. Further, "opening the array" means that one less speaker can address an intended angle of horizontal coverage. While the speakers may not look as attractive with spaces between them, they often sound smoother and require less equalization. And one less box is needed—per side.

How about one less row? While speaker designers are becoming more careful to match their trapezoidal enclosures to the actual horizontal dispersion angles, stacking or dead-hanging several rows without incorporating vertical splay almost guarantees there will be overlap from one box to the next in each column. Multiple enclosures firing into the same vertical plane causes interference that can offset the benefits of

QUICK TIP

Many speaker systems rely on digitally based processors. The weak link in some processors is their A/D converters and anti-aliasing filters; many are no better quality than those found in consumer DAT machines.

Single-space, rack-mount digital converters range from three figures to several thousand dollars, but if this signal is going to a hundred thousand watts of P.A., care for the sound should be at least as high as CD mastering.

Most A/D converters have a variety of output options and will be compatible with higher precision digital processors in the future that can accept the full AES/EBU 24-bit standard. Many stock A/D designs use generic op amps and capacitors in critical audio paths.

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adding extra rows. In order to minimize vertical overlap, the array must bow back as well as bend around. Just as a "point-source" attempts to reproduce a section of a spherical wave front, so the shape of a well-designed array should approach a section of a sphere. Recent down-fill and long-throw speaker designs and rigging systems that allow for varying angles of vertical coverage address this issue, but simple tools can work as well. For example, the top row of a stacked array can be tilted up with "audio wood," foot-long two-by-fours painted black. When flying a system, point the bottom row down, the top row up and leave the fourth row back in the shop. Unless the desired result is simply high SPL and combing, less is more.

How about little tiny speakers? There's nothing simpler than adding small front-fill speakers for the golden circle. The first couple of rows are guaranteed to be sold but are often impossible to cover adequately with the main arrays. Front-fill speakers increase the direct-to-reverberant ratio and hence the quality of sound in the most expensive seats, and a modest amp and anything from a Minimus 7 on up works better than nothing. Front fills can be creatively placed in a variety of spots—on the back side of the down stage row of floor monitors, for example. Placing pairs every ten feet across the stage edge

is effective. They don't need EQ or delay, and they don't even need a separate matrix, though proper use of those techniques can bring added benefits. Small speakers are easily stowed, and some companies have seen fit to build a dedicated fill amplifier into their main, monitor or sub amp racks, making deployment of front fills a routine procedure.

EASY ON THE EQ

How about less EQ? Most contemporary systems require little or no equalization to perform smoothly when set up correctly. Unfortunately, many engineers learned habits back in the good old days, when systems with jagged response were the rule. Conventional wisdom is to "bump and dive" the sliders on a graphic until it "sounds good," without bothering to find out if it sounded better with just one or two critical cuts. Graphic equalizer filters typically interact to the point that it is impossible to use many at once without losing headroom in the system. Beware of the "every other slider" syndrome: If more than half of the filters on a graphic are in use, there's a good chance the system has been over-EQ'd. This is a classic case of less is more.

With EQ available in delay lines, processors, crossovers and console outputs, as well as graphics and parametrics, it's easy to equalize to the point where it's hard to keep track of where

NEWSFLASHES

Community Professional reports installations of its loudspeakers in three stadiums: Texas' Cotton Bowl Stadium; Ericksson Stadium, home of the Carolina Panthers; and Folsom Stadium at the University of Colorado. The Cotton Bowl received five M4 midrange drivers using two SH1894M 90x40 horns, two PC156-4M 60x40 horns and a PC1542M 40x20 horn. Eight CBX315FE triple 15-inch bass horn systems were spec'd for low frequencies, and high-frequency components included 11 PC300 Series horns fitted with carbon fiber diaphragm EM282 160W compression drivers. Also installed were four weather-resistant RS660FEs and an SH494/M200 voice-range horn driver. The Ericksson and Folsom arena systems include Community's M4 CoAx™ and Leviathan II speakers...Autograph Sales, the London-based equipment sales and instal-

lation company that handles most of the West End's theater productions, completed refurbishments to the Lyric Theatre in Hammersmith. The system was designed by the company's Richard Barman and the Lyric's house engineers...Real Time Audio (Las Vegas) is providing equipment for the latest version of the Ice Capades. Sound design for the show is by Mark Dennis. XTA Electronics reports that the production is employing its CP200 digital audio processor...Garwood in-ear monitoring is being used on a number of popular West End shows, including *Jesus Christ Superstar* (sound design by Richard Ryan) and the surprising musical version of Emily Bronte's *Wuthering Heights*, *Heathcliff*. The company's Radio Station IEM system is also being used for Barney the purple dinosaur's nine-month U.S. tour. Gear for the Barney shows is being provided by db Sound of Chicago. ■

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adjustments may have been made. Overuse of EQ wreaks havoc with a speaker's phase response, steals headroom and confounds the use of tone controls on individual channels on the console. In the case of onstage monitors, octave-wide filters for feedback control can easily put the engineer into a hole that is hard to mix out of. Equalization is often a balancing act, and taking out too much of the correct frequency out only guarantees that others will have to be cut.

PRESETS TO GO

Invention and ingenuity constantly provide us with better speaker products. Innovations in cabinet construction from synthetic composites take advantage of higher stiffness-to-weight to produce lighter speakers that focus more energy toward the audience. Developments in high- and low-frequency transducers, array configurations, horn geometry, magnetic materials and topologies have all resulted in a plethora of new commercial and proprietary systems with excellent performance characteristics. Magnetic oil, custom waveguides, amps in speakers, cats living with dogs—where will it all end? The half-life of speaker technology is barely the time it takes to depreciate them. It seems inevitable that successful sound companies will refurbish, retrofit and ultimately replace all of their main speakers to keep ahead of the competition.

But how is all of this new technology used? There is little point in trading up to a new generation of equipment if old methods take no advantage of the new features and benefits. A little time spent tweaking speakers and arrays before you even go to a show can establish what improvements are possible, and may save hundreds of hours of work throughout the year. Extra time spent in a local venue can also validate some of the techniques mentioned above. With a precision measuring system, a full day spent recording the response of various speakers in inventory can be the foundation of a companywide manual for system engineers. With the aid of programmable EQ or processors, results can be stored as presets. Systems with manual control can benefit from a similar process that simply documents successful filter combinations and crossover levels. These settings can be physically attached to the drive rack with a Sharpie and tape, a P-Touch labeler, or laminated and fastened with a cable tie. Time



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and effort saved at gigs makes the company look good and allows time for client relations, drinking coffee, swapping stories or advancing the next show, while the squints get more time to tweak the lights.

REAL ESTATE REALITY

On some large tours, the cost of production doesn't seem to be a factor, but the trend toward higher-power, lighter-weight amps and speakers has made it possible to put an arena rig into a single trailer. Trailer space on tours goes for up to \$100 a week on a per-foot basis,

and you'd be hard-pressed to find a tour accountant who doesn't appreciate saving the cost of a semi and its driver. And even saving a dozen feet of truck space can open up the "dance floor" for the extra speakers needed for rear-fill on sold-out shows, provided the production manager hasn't already grabbed it for band gear.

Local sound rental companies face a different situation. With a "bobtail" typically holding almost half the volume, but only a quarter to a third of the weight of a semi, their operators are eager to reduce the mass of the largest components in the rig. A popular method of saving money while still

bringing the essential parts of the show is by renting "racks and stacks" locally, allowing the band gear, consoles, monitor system and T-shirts to go into a straight truck, or perhaps even a trailer on the back of the tour bus for those with Lilliputian requirements. This approach allows tours to comfortably switch between showcase clubs, small "soft-seaters" and college gyms, while saving hundreds of dollars a week. It has also resulted in a healthy market for name-brand, front-of-house speakers that can be requested on a technical rider. However, "racks and stacks" rentals can be a challenging proposition for a sound company—the opportunity cost of renting the mains is that they cannot be used with the rest of the system for a full-on show somewhere else.

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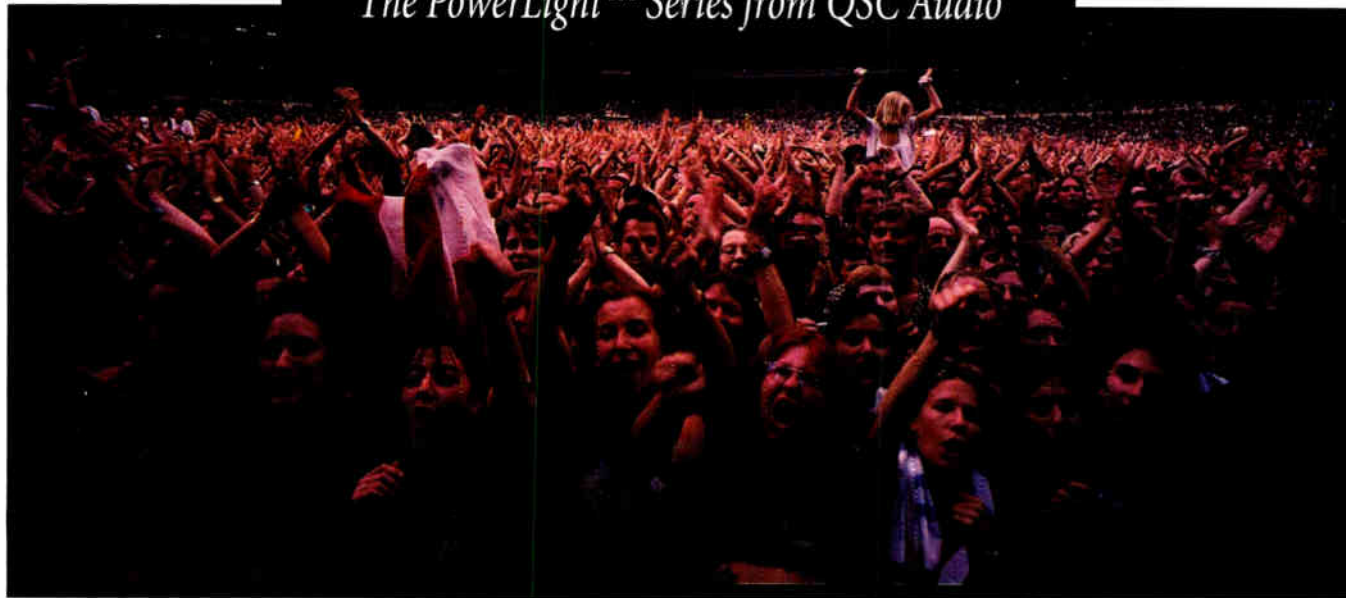
Economics is the study of finite and limited resources, like the dollars in your bank account and the number of speakers back in the shop. Right now you're thinking, "Aw shucks, I didn't know there was going to be any math in this column." How do you make a million dollars in the sound business? Try starting with ten million.

Charging for services based on costs is a cornerstone of mature industries. Seat-of-the-pants pricing can yield round numbers, but a pricing formula based on (the value of the equipment supplied) x (a discount factor) provides structure. Of course, a pricing structure can always be modified, but it also makes it obvious when you begin to give away the store for the sake of staying open.

The formula can be as simple as 1% of the replacement cost multiplied by a discount, plus labor and trucking. This is easily calculated from the inventory spreadsheet that should already exist as a basis for financial and insurance calculations. Discounts allow flexibility to give customers prices they deserve. The resulting price won't be a nice round number, but it may confuse the cretins who enjoy beating you up a hundred dollars at a time. An extra Franklin every time the system goes out easily pays for new speakers. When the negotiations get sticky, just play good cop, bad cop and blame it on your new accountant, Lester Moore. ■

When he's not in the back of a truck, Mark Frink can be reached at 625 NW Everett Street, Suite 111, Portland, OR 97209, or by e-mail: mfrink@teleport.com.

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—FROM PAGE 159. REBA MCENTIRE

low passes and grabs up her high passes," says Moeller. "It's a bigness device."

PRISM IN THE ROUND

The P.A. is a Showco Prism system powered by Crown amplification. For the "in the round" setup, the flown array is made up of 80 cabinets, broken into four quadrants facing out at 90-degree angles from each other. Moeller considers the Prism system to be one of the best P.A. designs available, as far as meeting his needs for adaptability and consistency. "Basically, we've got 360-

degree coverage, pretty much trim out to where we've got the most concentrated area of coverage," he explains. "Obviously, we want to stay out of some roofs that are just acoustical nightmares to begin with. I want to make sure that everybody is as close to being there as they can, audiowise."

Moeller admits to having been a little skeptical initially about mixing in the round. From an imaging standpoint, his FOH position in the corner on the floor is in probably the worst place to mix the circular array. How does he compensate? "If it sounds great here, it sounds especially good in the places where it's optimum to listen," he says.

"Obviously, dealing in stereo and 360 degrees, there's going to be a little bit of imbalance perception, but still it's relevant to your position; you still hear everything. It's more spatial like this. It's actually bigger, because you're not at one end of the room trying to propagate the image all the way to the back and then getting those reflections." He also stresses the fact that the onstage performers are using an ear monitoring system makes his life easier. "I don't have a bunch of leakage, so anything that's going on in the room is my fault."

SPL readings during the show are moderate at most. "There are times when we're in a low trim and a smaller arena, to where my SPL is such that I can still hear the cymbals and some of the drum kit live from the pit, being this close to it," says Moeller. On the many quiet ballads, SPLs run around 108 to 110 dB (C-weighted) on the average. "The crowd is usually at least that," says Moeller, who has measured show intro and outro levels at more than 120 decibels, thanks to enthusiastic Reba fans. "I've seen the crowd peak out at 116, 118—from this position," he says. "The crowd's frequency response hurts—the P.A. is nice and smooth, so even when it gets loud, it's comfortable to listen to. The audience is not comfortable to listen to."

The FOH area also serves as a sort of "command central," where Moeller works with systems engineer Greg Smith and McEntire's husband and tour producer, Narvel Blackstock, who, in addition to his acute producing skills, directs the show by using the cueing system and ear monitors to communicate with performers. Through talkback, he'll call cues if something crashes during the show, or relate changes to the musicians.

MIDI-LINKED EFFECTS

The musicians in the pit are directly below and inside the P.A. array, "The pit's pretty interesting the way it's laid out, because there's 11 musicians in there," says Moeller. "It's pretty consistent in there. What affects them is that what comes back from the first reflection in the room sums up in the middle. That's pretty much all that Kosmo has to deal with."

Kosmo, or Robert "Koz" Kosloskie, is Reba McEntire's monitor engineer and has spent the last decade with Starstruck Entertainment. At San Jose, he was assisted by Showco monitor systems engineer Woody Woodard. Monitor mixers include a 52-input Yamaha PM4000 and a 36-input Ramsa WSR840

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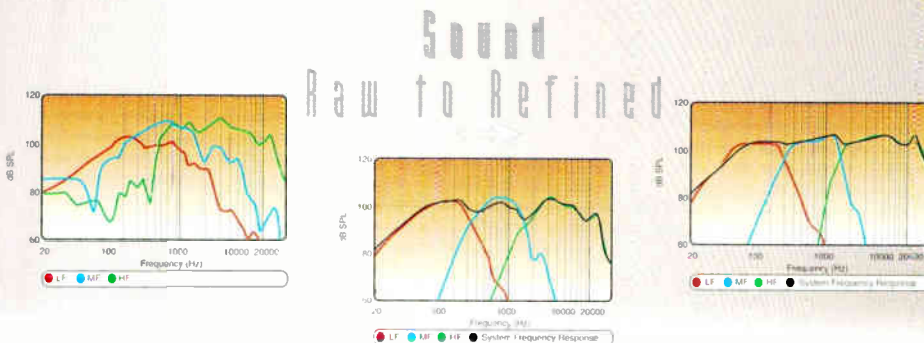
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with an additional two eight-way inputs. Kosloskie explains the configuration: "We have nine stereo mixes out of the Yamaha that we use, which is 18 buses and then four for effects; then we use six buses out of the Ramsa for ear monitors, two buses for the drum monitors, two buses for the side fills and eight buses for ADAT." Processing gear includes a BSS VariCurve, four dbx 160s, Drawmer DS201 gates and DS221 limiters. "I also use a Summit DCL200 dual compressor/limiter on Reba's vocals," continues Kosloskie, "and a PCM 70, SPX 900 and two SPX90s, a graphic EQ and another VariCurve for my side-fills; that's all MIDI-linked together, so every song is a step number."

Most of the band instruments are run direct, with the exception of some amp cabinets under the stage, which are miked with 421s, and percussion. Drum mic selection is familiar: AKG 414, RE20s, 57s, 451 on hi-hat and EV 408s on toms. All of the wireless mics are Vegas, supplied by Systems Wireless; headset microphones, worn by Reba McEntire, Linda Davis and three background singers, are Crown CM311s, with belpacks by Vega Wireless. The keyboard player sings through an SM58. An elaborate spare mic system includes ten extra headsets and a pair of handheld Vegas, fitted with Crown heads. Since McEntire's belpack is built into her costume, there is no way to reach it during a song—good reason for a handheld backup. However, there are plenty of those famous costume changes taking place during the show, providing quick opportunities to switch a belpack, if necessary.

BACKUP IN-EAR MONITORS

Reba McEntire was one of the earliest acts to switch to in-ear monitors; she has been using them for six years and personally owns all of the Future Sonics sets used in the show. "Each [monitor] mix has a Dominator 2 on the input, and then it goes to the Radio Station," says Kosloskie. "There are seven of those. I have two for Reba—I have a second unit that's on the same frequency as Reba's, and we've got it looped into our system where we can just patch it on the back to any of these mixes after the limiter, and have a spare. Or if Reba's crashes then we've got the spare right here on the same frequency, where she doesn't have to change belt packs." The dancers on-stage mainly use the P.A. as their moni-

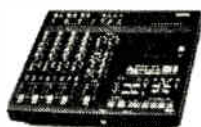
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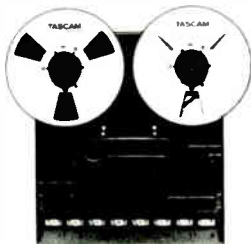
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tors, and sidefill backup monitors turned on during dance tunes serve as reference when they perform behind the P.A.

Kosloskie has a stereo switching system based on a post-limiter multi-break-out that takes a signal and puts it on a switch. "Whichever switch you hit, it dials up that mix, post limiter," says Kosloskie. "So it's actually the same signal that the amp or transmitter is seeing. We can also cue the desk in stereo, we've got patch points in the back where you can plug in a CD player or an intercom." The switching system is a crucial aspect of the show, he says. "This is the key to doing efficient ear monitors, I believe, being able to switch back and forth and hear what those guys are hearing exactly."

McEntire's drummer wears Sony V6 headphones, supplemented with one Showco B1 sub-bass and 2 SRM speakers. "All that's in there is the kick drum, just for some body, because we have ear monitors" says Kosloskie. "And we have a click machine that he runs; all the band can be synched up together." There is also an FX click being sent out for video synching. "Then I have FX left and right that Ricky [Moeller] sends out of his desk, which contains the CD player, DAT, cassette, and anything to video, of which there's four lines. All of that feeds down to two channels for me. I also take the toms from Ricky. He takes all four of them in the snake, gates them, EQs them, sends them back to me, left and right. So that saves me a couple channels."

As for processing, "I don't use any EQs on the outputs, I mix it in the desk," says Kosloskie. "If I can make that EQ sound good, it sounds good in every mix. There's no separate EQs. Even though this desk has four-band EQ on each output, I use it for one guy, the steel player." For reverb, Kosloskie uses a PCM 70 on McEntire's vocals; an SPX900 on the background vocals; an SPX90 on snare, fiddle, saxophone and trumpet; and some chorusing programs on the acoustic guitars. All reverbs are linked to MIDI changes and are all returned in stereo.

Sounds like a lot to manage over two-and-a-half hours. When asked how the crew keeps up with the fast pace of the show, Kosloskie laughs and says, "It's pretty intense; there's a lot of things going on." ■

Sarah Jones is a Mix assistant editor.

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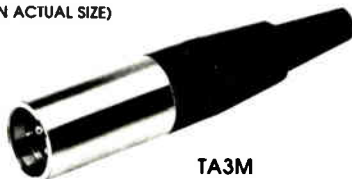
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LIVE SOUND

—FROM PAGE 160, BOB DYLAN

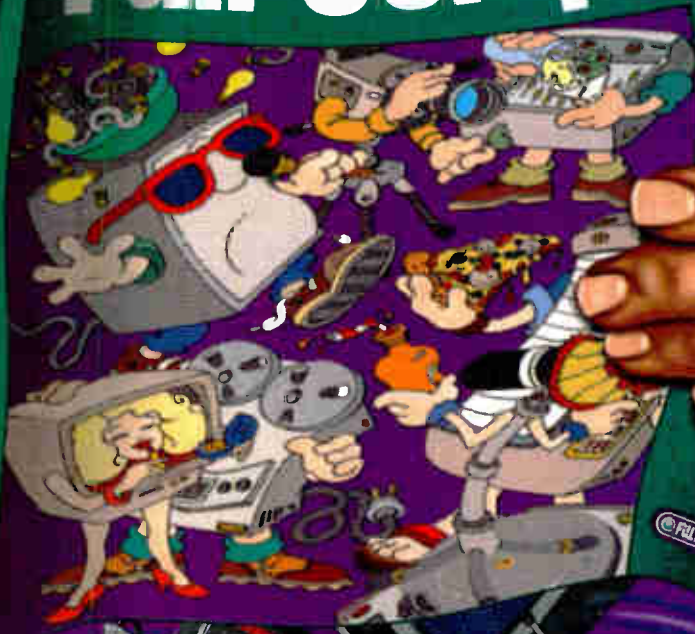
proscenium theaters with a few arenas thrown in. "In most rooms, we used a half-dozen boxes per side, about 26 feet off center and in line with the front of the stage." Wynne notes. The column hangs from a 4-foot square bumper. "Though up to eight of the 220-pound boxes can hang on a single point, using two points up- and down-stage is easier and more common," Graphix adds. The largest venue was the Dane County Coliseum in Madison, where ten boxes per side were used for a 12,000-capacity room. "V-DOSC requires fewer boxes and far less EQ'ing than any I've used before," Graphix explains. "I generally just Fletcher-Munson it a bit, taking a little 2 to 3 kHz out to make it sound like a good home stereo with the loudness on. On other P.A.s, I would use twice as many boxes and 12- to 15dB cuts would be common."

Wynne used a Gamble EX-56 consistently for the first time on this tour. "I've used them occasionally for one-offs," he comments. "While I'm not crazy about the layout, I really love the way it sounds, and that's the most important thing." Inserts include Drawmer DS-201 gates on drums and Summit compressors for vocals, acoustic guitars, mandolin and the bass direct. Effects include a Yamaha REV7 snare program (#22) and an SPX-1000 for vocals set to an exciter-reverb program. "There's also a Lexicon PCM 80 used with a Leslie program for the steel and a PCM 70 for lead guitar, as most of the guitar sounds are dry other than the spring reverbs in the amps," Wynne explains. "This show is fairly dry, but I have a Lexicon 480 that I'll use for special effects on certain songs, like when I need to get a big drum sound." In order to free up channels on the Gamble for the support act, effects were submixed through a Mackie 1604, which worked "amazingly well" according to Wynne.

Jules Aerts mixes monitors on a Yamaha PM4000M and is assisted onstage by Electro-technician Bruce "Beeg" Andrews. Electrotec's QM-2 floor wedges, each loaded with a JBL 15 and 2-inch driver, are used in pairs; the drum mix is supplemented with a double-18 sub. Dylan has an additional pair of QM-2s upstage behind him as fills. Bass-player Tony Garnier's monitor mix comes through a single wedge, but he uses an additional two floor monitors loaded only with 15s as his bass rig. A small single-12 wedge is used at each of

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LIVE SOUND

Bucky Baxter's seated positions for steel and lap guitar on a riser to the right of the drums. Sidefills consist of a three-box stack of Electrotec's Opera Series, which include a high-mid, a low box and a double-18 sub. All monitor speakers are powered with Crown amplifiers.

Dave Kemper's kick drum is miked with Shure's new Beta 52 and an SM91 for "thump and click." SM57s are used on snare top and bottom and three Electro-Voice N/D 408s pick up toms. For overheads, Wynne eschews the typical condenser arrangement in favor of a Shure VP-88 stereo mic. "This provides a better image of the drums," Wynne adds, "and the stereo field provided by the V-DOSC system helps this even more."

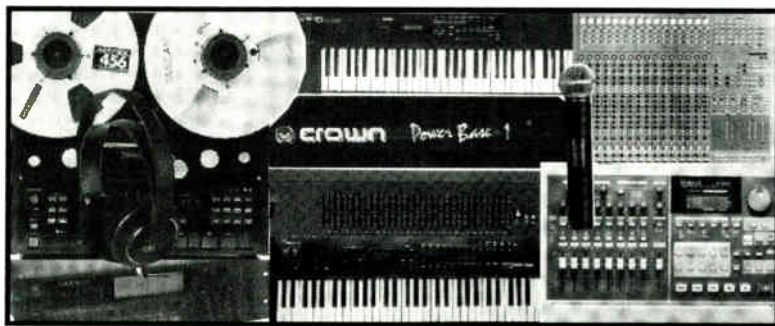
John "J.J." Jackson, lead guitar and backing vocals, plays through a Vox and a Fender, while Dylan uses a Fender and a Matchless amp. All instrument speaker cabinets are miked with Sennheiser 421s. "As an old dog, I like to use the 421 placed a few inches back so I can hear the entire speaker," Wynne explains. "I don't EQ them, but instead I work with the musicians to get their guitars to sound good in the P.A." Most of the direct boxes are Countryman Type 85 DIs, except Dylan's Demeter, which is used to warm up his Gibson acoustic guitar.

Two more Fender amps are located offstage, one used for harmonica with a Shure Bullet mic that is also taken with a DI, and a second that is also used in the same fashion with a second Bullet mic for a "dirty vocal" effect by Dylan on certain songs. Other than that, all vocal mics are Shure Beta 87 condensers. Wynne switched to these from Beta 58s at a remote several years ago at the suggestion of the Record Plant truck's engineers, as Dylan's voice can be challenging. "Clarity in the vocal range is the main reason we wanted V-DOSC," Wynne adds. "After using them at a local festival in Sweden last year, I was amazed and determined to use them in America."

"Go listen to it yourself and walk the hall," was Wynne's final bit of advice. "Once you mix on V-DOSC the benefits will be obvious." In Fort Worth Star-Telegram staff writer Dave Ferman's October 26 review, sub-titled "Only this time you can hear the words," he wrote "...you could actually hear darned near all the words, a rarity at the six Dylan shows I've seen since 1978." I couldn't have said it better. ■



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QSC SIGNAL CONTROLLER

The NSC-8 Networked Analog Signal Controller from QSC (Costa Mesa, CA) is a modular tool for controlling the gain and routing of multiple amps in complex installations. Featured are eight independent channel gain controls, eight comp/limiters (with variable threshold/release times and four compression ratios) and an RS-232 port for remote control via a Windows PC, with eight additional "taps" for interfacing other equipment. An optional 8-channel load monitor allows real-time mon-



itoring of speaker loads and can trigger alternate routings in case of amp or speaker failures.

Circle 212 on Reader Service Card

ART GRAPHIC EQ

Applied Research & Technology (Rochester, NY) introduces the 351 single-channel, $\frac{1}{3}$ -octave graphic equalizer, a 1U unit with 31 bands of constant-Q operation. Features include switchable 6/12dB boost/cut range, adjustable high/lowpass filters and variable -10/+4 signal input. LEDs indicate input clipping, boost/cut range and bypass. I/Os



are balanced XLR and $\frac{1}{4}$ -inch TRS and unbalanced RCA connectors, and the unit includes rear panel ground-lift and voltage-select switches for the internal PS.

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Martin Audio (distributed by TGI, Kitchener, Ontario) introduces the ICT 500, an innovative full-range speaker system with two internally mounted LF 10-inch drivers, two front-mounted 10-inch ICT drivers and an HF diaphragm that is centrally located and horn-loaded with a phase plug and wave guide. The HF diaphragm has no voice coil, but is driven by magnetic induction created by the LF driver voice coils, eliminating the possibility of HF voice coil burnout. The Martin M2 controller for the ICT 500 provides necessary EQ functions and provides a mono sub-bass output for using the ICT 500 in conjunction with ICS 300 bass systems.

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BSS VARICURVE/OMNIDRIVE UPDATES

BSS Audio (Nashville, TN) adds new options for the Varicurve™ equalizer/analyzer and Omnidrive™ stereo crossover systems and announces an Omnidrive fixed install version. The FPC-900 remote controller offers improved control functionality for the Varicurve, the Omnidrive and the TCS Series delay products, with as many as 16 BSS systems controllable from a single head. A Soundbench software package controls Varicurves from a Windows/MIDI-

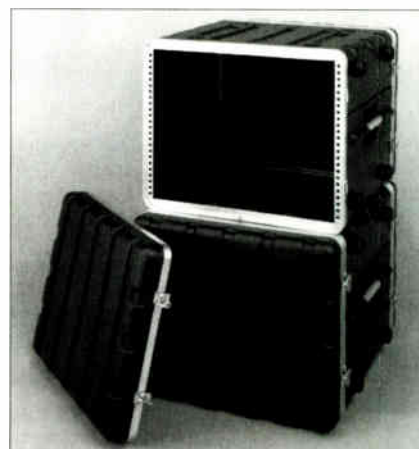
equipped PC. Optional Omnidrive AES/EBU digital I/O cards replace the standard analog I/O to provide all-digital live sound speaker processing. The FDS-380 Omnidrive Install offers all of the Omnidrive functions (2-channel, four-way crossover, 2-band parametric EQ, variable delays, protection limiting, 60 recallable presets) in a tamper-proof package. The FDS-380 has no front panel controls and must be adjusted with a standard Omnidrive or the BSS Soundbench software (available for the Omnidrive later in '97).

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CREST CA18 POWER AMP

Crest Audio (Paramus, NJ) has introduced the CA18, a new addition to the Crest CA Series of amplifiers. The 3U CA18, designed as an affordable, high-power amp for DJ, club and touring systems, is rated at 1,800 watts into 4 ohms, 2,500 watts into 2 ohms. As with other Crest amplifiers, the CA18 features TourClass® protection circuitry, toroidal power transformers and an overbuilt power supply.

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**ELECTRONIC
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**TECHNO MATURES INTO
AN ARTFORM**

by **Bryan Reesman**

As electronica moves closer to the mainstream, the "average listener" is just begin-

sounds of pop music, techno draws on high-energy sequencing and programming, powerful kick beats and a futuristic aesthetic that propels listeners—most often clubgoers—into a dancing frenzy.

Defining what techno is these days can be quite a challenge when one considers so many of its subdivisions: jungle,

music have an ever-expanding audience, and creators who are continually expanding the music's vocabulary. Its highest practitioners have found a way to marry the synthetic with the organic, the surreal with the real, and dance-floor sensibilities with intellectual food for thought.

One of the greatest misconceptions about electronic dance music is that it is easy to produce: program a sequencer, work out a few simple keyboard patterns, and you're on your way. True, many popular techno/electronic dance

—CONTINUED ON PAGE 188



Left: (L to R) Mike Maguire and Ben Watkins of Juno Reactor

ning to make sense of this modern form of music. Unlike more conventional guitar-bass-drums rock combos or the lighter

bhangra, ethno-techno, trip-hop, et al. However, one thing is for sure: These newer forms of electronic dance



RECORDING RICKIE LEE JONES' "SUNSHINE SUPERMAN"

by **Barbara Schultz**

There's much more than kid-stuff on Reprise Records' soundtrack to *Party of Five*: the popular Fox-TV series about five orphaned brothers and sisters struggling to maintain their family without parents. The album features a thoughtful collection of bands and singer/songwriters whose music is being used on the show; executive producers from Warner/Reprise and *Party of Five*



PHOTO: LE CANIELON

worked together to select songs that would be meaningful to viewers, as well as the uninitiated. "We used a combination of some of the songs that have been impor-

tant for them over the last couple of seasons, like, obviously, The Bodeans' 'Closer to Free,' which evolved into a theme song for the show."

—CONTINUED ON PAGE 194

party of five



PHIL COLLINS' POST-GENESIS "DANCE"

by **Bruce Pilato**

When Phil Collins decided to cover Bob Dylan's 1963 folk classic, "The Times They Are A-Changin'" for his new LP, *Dance Into the Light*, most of Collins' music industry peers didn't get it. After all, this is a song that most people equate with the civil rights movement and the heavy socio-political changes America experienced at the dawn of the '60s. So, what

the hell is it doing on a Phil Collins album, alongside dance tracks and pop songs?

"That song is about freedom, lyrically and literally," says Phil Collins, leaning back on the black leather

room of Atlantic Records' New York office. "It's about people in places having the weight lifted off. The lyrics are just as relevant today as they were then. It's also about, subconsciously, finding something in myself. I have

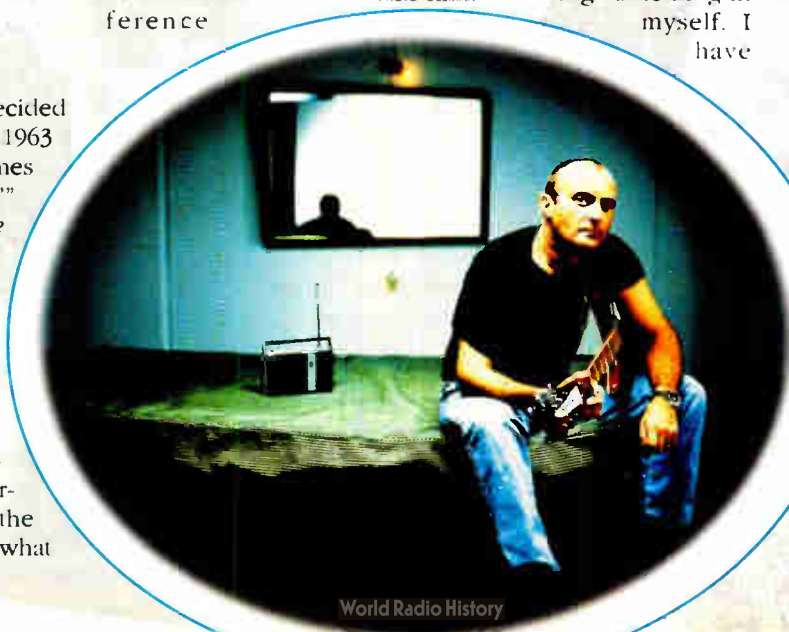
to say that I've found a freedom and a happiness."

For Phil Collins, the times surely have changed. He recently ended his marriage of many years with his second wife, Jill, and moved to Switzerland to be with his current girlfriend; he ended his 25-year association with Genesis; he formed his own record company, Face Value Records; he assembled and toured with a 20-piece jazz big band. And, on top of all that, Collins wrote and recorded *Dance Into the Light*, his seventh solo album, in a studio overlooking the Alps.

His previous solo LP, 1993's *Both Sides*, was met with mixed reviews and limited commercial success because it

—CONTINUED ON PAGE 196

PHOTO: GUZMAN



World Radio History

ISAAC HAYES' "THEME FROM SHAFT"

by Blair Jackson

Who's the black private dick that's a sex machine to all the chicks?

Shaft!

Damn Right!

If you were paying attention to popular music in the early '70s, there was no way you could have missed Isaac Hayes' striking presence. With his shaved head, sunglasses and his bare, muscled chest often covered in gold chains, he cut a strong, imposing figure onstage and in pictures—an ultra-cool Black Moses (to quote one of his album titles) whose deep but dulcet voice made men jealous and women weak in the knees. Hayes' grand, extended, string-filled productions influenced acts like The Temptations and Barry White, and even helped lay the groundwork for the entire disco movement in the mid-'70s. His most



Hayes (L) with Richard "Shaft" Roundtree

emerge from Memphis, a city that has been synonymous with urban blues and soulful grooves for this entire century.

Hayes was born just north of Memphis, in the town of Covington, in 1942. He was raised mainly by his grandparents, who were sharecroppers. They instilled in him a love for sacred music; by age five Hayes was already singing in church. In his teens, Hayes and his grandparents moved to Memphis, and it was there that he first started to play music in earnest, learning both the piano and saxophone. While still a teenager, he began to play in local clubs with groups like Sir Calvin Valentine & His Swinging Valentines and Sir Isaac & the Doo-Dads, and by the time he was 20, he'd put out a record called "Laura We're on Our Last Go Round" on the Memphis-based Youngstown label. In the early '60s Hayes landed a gig as sax player for a Memphis group called The Mar-Keys, and that in turn led to his getting session work for Jim Stewart's Memphis-based

Stax label, which had opened its doors in 1959. By 1964, Hayes was working at Stax regularly (though he kept his job at a meat packing plant for a while), first as a musician, mainly playing keyboards for Otis Redding and others, then as a songwriter—with his partner David Porter, Hayes wrote dozens of songs for Stax artists, including such classics as "Soul Man," "You Don't Know Like I Know" and "Hold On, I'm Coming" for Sam & Dave, "Baby" for Carla Thomas, and "I Had a Dream" for Johnny Taylor.

In 1967, Hayes cut his first album for a Stax subsidiary called Enterprise Records. Though that record wasn't a hit, his next album, *Hot Buttered Soul*, was, making it into the Top 10 of the *Billboard* pop charts, and firmly establishing Hayes' style: The album contained just four long, languid, heavily orchestrated compositions by such middle-of-the-road tunesmiths as Burt Bacharach ("Walk On By") and Jimmy Webb ("By the Time I Get to Phoenix"). Both of those songs had previously been hits, as had another popular Hayes cover, "Never Can Say Goodbye," but all became major R&B hits with considerable pop crossover appeal.

Near the end of 1970, Hayes was asked by director Gordon Parks to score a film called *Shaft*, about a black private detective named John Shaft (played by Richard Roundtree) who is hired to find the kidnapped daughter of a Harlem gang lord. (The early '70s, you'll recall, were the hey-day of so-called Blaxploitation films—action movies made primarily by African Americans for an African American audience—and *Shaft* was one of the most successful of the genre.) With his diverse writing experience and extensive background working with orchestras, Hayes was a natural to do a film score, and Stax Studios, at 926 McLemore Avenue in Memphis, was the natural place to record the soundtrack. Engineer William Brown, who'd worked at the studios since they opened in 1959, recalls, "During the time Isaac was working on *Shaft*, you'd see him sitting in his office watching the movie and he'd be humming and getting the stuff down on piano that he was going to do. Then he got with one



visible years were the early and mid-'70s, when he landed hits like "Never Can Say Goodbye," "Theme From Shaft," "Do Your Thing," "Joy (Pt. 1)" and "Wonderful" on the upper reaches of the charts, and sold millions of albums. But Hayes also had a vital career as a songwriter and a musician long before he donned his chains and cape, and he also enjoyed many chart successes after his commercial peak. Certainly he is among the most popular artists ever to

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of his arrangers (Johnny Allen) and they worked up the orchestrations together.”

Brown remembers that time at Stax as being particularly blissful, with “everybody helping out everybody else and working together to make the best music we could. It was like a family there. Isaac was a really good guy; everybody will tell you that. You could walk down the hall there and holler, ‘Hey man, I need a piano part on this song,’ and it didn’t have to be his session, and he’d come in and help you out, no charge. Same thing for pretty much all the MG’s and everybody in that day. You catch a singer walking down the hall, you say, ‘I need some background vocals. Can you help me out?’ And they’d do it for you. There was no competition at all.”

“Working with Isaac it was always very relaxed; there was no pressure,” adds Ron Capone, chief engineer at Stax in the early ’70s. “Isaac didn’t care how long it took to get what he wanted on any particular thing. He was really easygoing and fun to work with.” Certainly the music Hayes made reflected his laid-back demeanor.

The “Theme From Shaft” was one of just three vocal pieces (out of 15 total) Hayes wrote for the film, and it’s barely a “song” in conventional terms. Rather, it is mostly just a deftly constructed instrumental groove dominated by a wah-wah guitar and an insistent hi-hat, churning through a lush, sophisticated orchestral arrangement full of staccato horn stabs and racing violins. Hayes intones, rather than sings, his vocal, which is designed to establish John Shaft’s macho credentials: “They say this cat Shaft is a bad mother,” he says before his female backup singers cut him off with a comical “Shut your mouth!” And so it goes. Not exactly poetry, but certainly memorable.

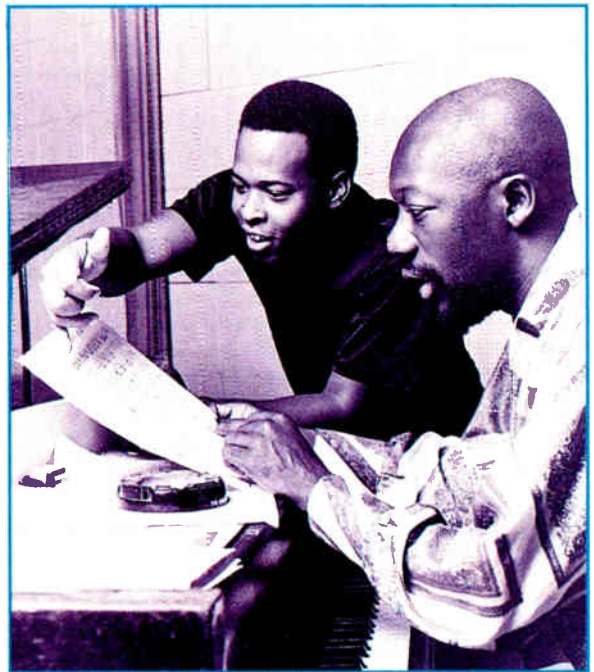
The way the song was recorded was fairly typical of how things were done at Stax in that era. The first things to be cut were the rhythm tracks, which included Hayes on various keyboards, Lester Snell on electric piano, James Alexander on bass, Michael Toles and Charles Pitts on guitars, Willie Hall on drums and Gary Jones on bongos and percussion. That session was cut entirely live in Stax Studio A, “the big room,” Brown says, which had a control room equipped with a 24-input Audiotronics console, a 3M 16-track recorder, a Scully 2-track used for the master, and a mono Ampex recorder. Monitoring was through four small EV speakers and a giant mono EV Voice of the Theater model.

Brown, who worked on the *Shaft* sessions along with engineers Ron Capone, Henry Bush, Bobby Manuel and Dave Purple, recalls that Shure SM56s were used to capture the guitar amps, and combination of an SM57 and a DI was used on the bass. The unforgettable hi-hat was recorded with an AKG 451E. The orchestral session, engineered by Capone, who had an extensive background in commercial music from years at Memphis’ William B. Tanner Co., was done on a different day, also live, using 65 members of the Memphis Symphony Orchestra. “We set them up the way they sit in the symphony,” Brown says, “and then we

tight-miked different sections. We probably had about 25 mics on them. For horns we used [Neumann] KM86s on saxes and French horns; 451 on trombones; flutes were [Neumann] U87; oboe and English horn were either a 451 or [Neumann] KM84. The strings were all 87s.” Brown estimates there were probably about a dozen orchestra takes: “The main thing was to concentrate on the timing; that’s the tricky part always with big orchestras.” What’s on the record is a single take, not multiple performances comped together.

The final sessions for the song were to put on vocals, where 87s were used for the background vocals and, for Hayes’ lead vocal, a 451E, which both Brown and Capone say is an unusual choice for that application. “Not many people can sing on that mic,” Capone notes. “With Isaac what we did was point it at his forehead, because it would puff so easy otherwise. But it sounded great with Isaac because he had so much presence and he knew how to sing into it. I remember trying it with David Porter on an album, and David couldn’t do it.” According to Brown, at some point after the recording was completed, Hayes’ lead vocal was accidentally erased and had to be re-done in another session.

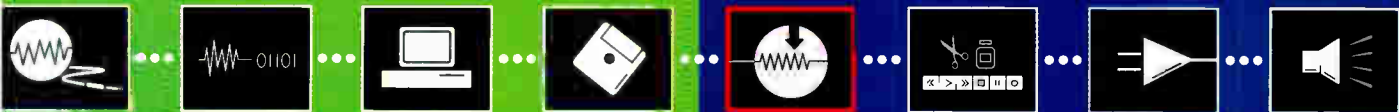
That travail aside, once the record was completed and released it became the biggest hit of Hayes’ career, with the single and soundtrack album both hitting Number One in the winter of 1971. The song won a Grammy Award for



Isaac Hayes and David Porter

Best Instrumental Arrangement (Hayes and Johnny Allen), and the album as a whole won Grammys for Best Original Score (Hayes) and Best Engineered Recording (Bush, Capone and Purple). In 1972, it won an Academy Award for Best Original Song. It was after the success of “Shaft” that Hayes’ career really took off, and he was able to tour the country with a huge production including a band, singers, dancers and a 40-piece orchestra. Hayes scored a couple more films, *Tough Guys* and *Truck Turner*, and he even landed some acting roles himself, including *Truck Turner*, *Escape From New York*, and a number of television parts.

By the mid-’70s, Hayes’ financial affairs were in serious disarray, and he left Stax (which folded soon after because of its own money problems) and signed with ABC Records, where he enjoyed a handful of moderate R&B hits. He eventually was forced to file for bankruptcy. In the late ’70s he enjoyed another career resurgence thanks to duets with Dionne Warwick and Millie Jackson, and in the mid-’80s he scored a Top 10 R&B hit with a song called “Ike’s Rap.” Hayes’ music has been sampled by all sorts of different artists over the past ten years, especially in England, strangely enough, and this has led to yet another resurgence of interest in him. In 1995 he put out a highly acclaimed album on Virgin called *Brand-ed*, so it looks like Hayes’ distinctive brand of hot buttered soul will be around for another generation to groove to. ■



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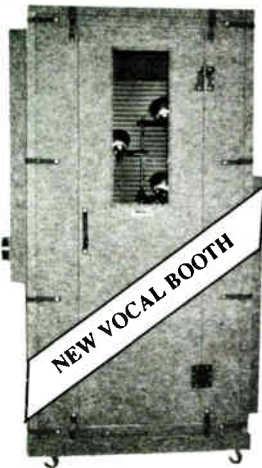
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—FROM PAGE 182, ELECTRONIC CINEMA

artists, such as the overrated Underworld or Leftfield, seem to suffer from the “Hey, I just learned how to loop and program, here’s my album” mentality. But others, like the melodically driven Juno Reactor, the highly acclaimed Future Sound of London and the cinematic ethno-techno duo Soma, show what happens when musicians take chances. And the results are at times less frenetic than their dance-floor cousins, relying equally on serene spaces as much as propulsive programming.

JUNO REACTOR SUBVERTING THE NORM

Led by Ben Watkins, British-based Juno Reactor go against conventional techno wisdom by asserting strong melodic lines into their fast-paced sequencing. They mix in unusual vocal and instrumental snippets and offer effective ambient passages at the beginning, middle and/or end of many pieces to give them room to breathe. JR’s third and newest album, *Beyond the Infinite* (Hypnotic), was not meant exclusively for club play. “With our stuff, we really want people to be able to hear it, to be able to put it on and listen to the whole album,” Watkins says. “I’m not really interested in catering to DJs. I want people to listen to it at home.”

Watkins works with different collaborators on each track; he is the artistic hub of the group. The only other consistent group member is Mike Maguire, a DJ whom Watkins respects and enjoys collaborating with. “He’s a DJ, but I really like his taste in music,” explains Watkins. “Although he isn’t a musician, he can put on something and immediately *mean it* with what he then plays.”

Though *Infinite* is rife with melodic, energetic techno, Watkins does not label what he does: “What we do is sort of psychedelic electronic dance music, you could say, really cinematic in its structure. I think when you go to clubs now, it’s like someone hammering the wall for ten hours. And you’ve got all these airheads dancing around. You wonder what the hell they’re listening to anyway, because they don’t know.”

Part of the reason Juno Reactor’s music stands out from the rest of the techno pack is its intriguing mixture of preprogrammed and live sounds. They mix up the live and sampled sounds, which also include voice and guitar, within their busy audio matrix. And, not surprisingly, they make use of a wide range of electronic gear. In the

synth department, there’s a Korg DW-8000, MS-20, Pro-One (from Sequential) and a Roland SH-101, not to mention a Digidesign SampleCell, Akai S-1000 sampler, and sequencers like Cubase and Emagic Logic. As far as processors and effects, they use the Eventide H-3000 Ultraharmonizer and the DSP-4000, Lexicon PCM 70 and PCM 80 reverbs, a TC 2290, Yamaha SPX1000, Roland DEP-5 and Zoom 9030, as well as dbx, BSF and Tube-Tech compressors.

For recording, Juno Reactor employed a combination of Neumann U87, Shure SM57, and B&K omnidirectional mics, with an AKG 414 used specifically for percussion. They use Mesa Boogie and H&H combo amplifiers. *Infinite* was recorded with Cubase audio software and mixed via Watkins’ 46-input DDA desk. With their arsenal of studio equipment, Watkins and his collaborators work from their gut instincts.

Watkins believes any music is good “as long as it sends you somewhere and puts you in an atmosphere.” Of course, modern dance music seems limited in that respect. “When you listen to a track and hear someone practicing their programming or practicing their elementary chord playing, it all becomes really boring. A real easy chord pattern can sound terrible, but in the right hands, it can sound really great.”

SOMA: ETHNO-TECHNO CINEMA OF THE MIND

Australia’s David Thrussell (also a member of Snog and Black Lung) and Pieter Bourke (formerly of Eden and touring percussionist with Lisa Gerrard and Dead Can Dance) form the innovative ethno-ambient-techno ensemble called Soma. On their sophomore effort, *The Inner Cinema* (Extreme), these sound sculptors create intelligent grooves with sonic elements from electronica, spaghetti westerns, Indian music, surrealism, techno and beyond. The music’s BPM count varies from track to track, and their approach to tempo is not very hyper.

“A lot of our best ideas come from experimentation—just getting some noise happening on a palette of sounds and seeing where it takes us,” Bourke explains. “We don’t get bogged down with too many technical distractions. Our setup is simple, and we like to work quickly and intuitively, making full use of accidents and mistakes if they sound good. We don’t care whether a sound is acoustic, sampled, programmed, out of tune or just plain

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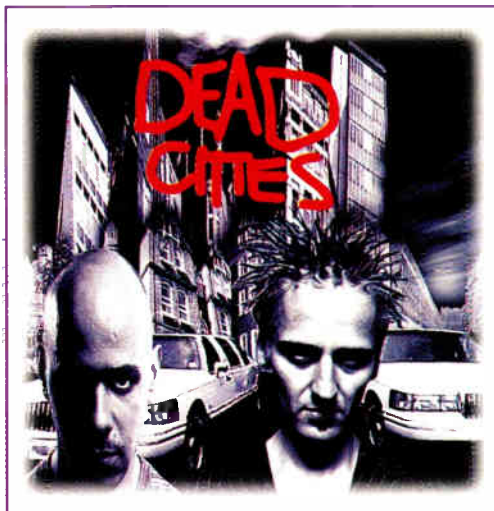
ugly. If it's working, then it's earned its place in the mix."

Their new album reflects this sonic manifesto. "There's a lot of acoustic sound and performance on *The Inner Cinema*, but most of it has gone through the samplers to get where it is. The main acoustic ingredient is percussion. There's a trumpet, a yang c'hin, and Dave's voice here and there. I really like the contrast between acoustic and electronic sounds. We don't have a lot of old analog gear, so what I do is drop in on friends who have ARP 2600s and System 100s. I'll bring a DAT with me and record lots of knob twiddling and then take it back to our studio, where it can be sampled, transposed, filtered and sequenced."

Still, Soma has many of their own electronic toys: "Our main gadgets are a Korg 01W and two Akai samplers, an S-3200 and S-1100. We also use a Novation Bass Station—which does a wicked acoustic bass sound on 'The Collector'—a Kurzweil K2000, Roland MKS 80, Korg MS 20 and a lonely old Roland RSP 550, which is our sole effects unit."

Many Soma tracks are aurally dense and complex, despite their seemingly smooth, interlocking patterns. The song "Baal" is a good example; it features dancing tabla, computerized pulses, dark ambiances, and powerful trumpet playing that conjures up Ennio Morricone scores, all coalescing into an imaginative, energetic composite. "Like most tracks, it formed out of some rhythm ideas," Bourke explains. "I often mic up some acoustic percussion and lay down heaps of tracks onto a Fostex RD-8, which I then go back and sample from, adjusting the timing in the samplers so all the loops fit together. We'd like to have Steinberg's Recycle, but we don't have a Mac so we do the same thing manual-style in the Akais. On top of the acoustic loops for 'Baal,' we added some sampled MS 20 percussion played into Cubase via an Octapad for a funkier feel."

With the rhythms happening, trumpeter Craig Pulkington came in and "laid down five or six improvised tracks to ADAT. Dave and I were in another room yelling out, 'make it more South American,' trying to get the vibe we wanted. We sampled the bits we liked, mapped them on the keyboard and gave it the 'dark distortion treatment.' From there, we built up an arrangement and added atmospheric samples and sounds to enhance the theme." Like the



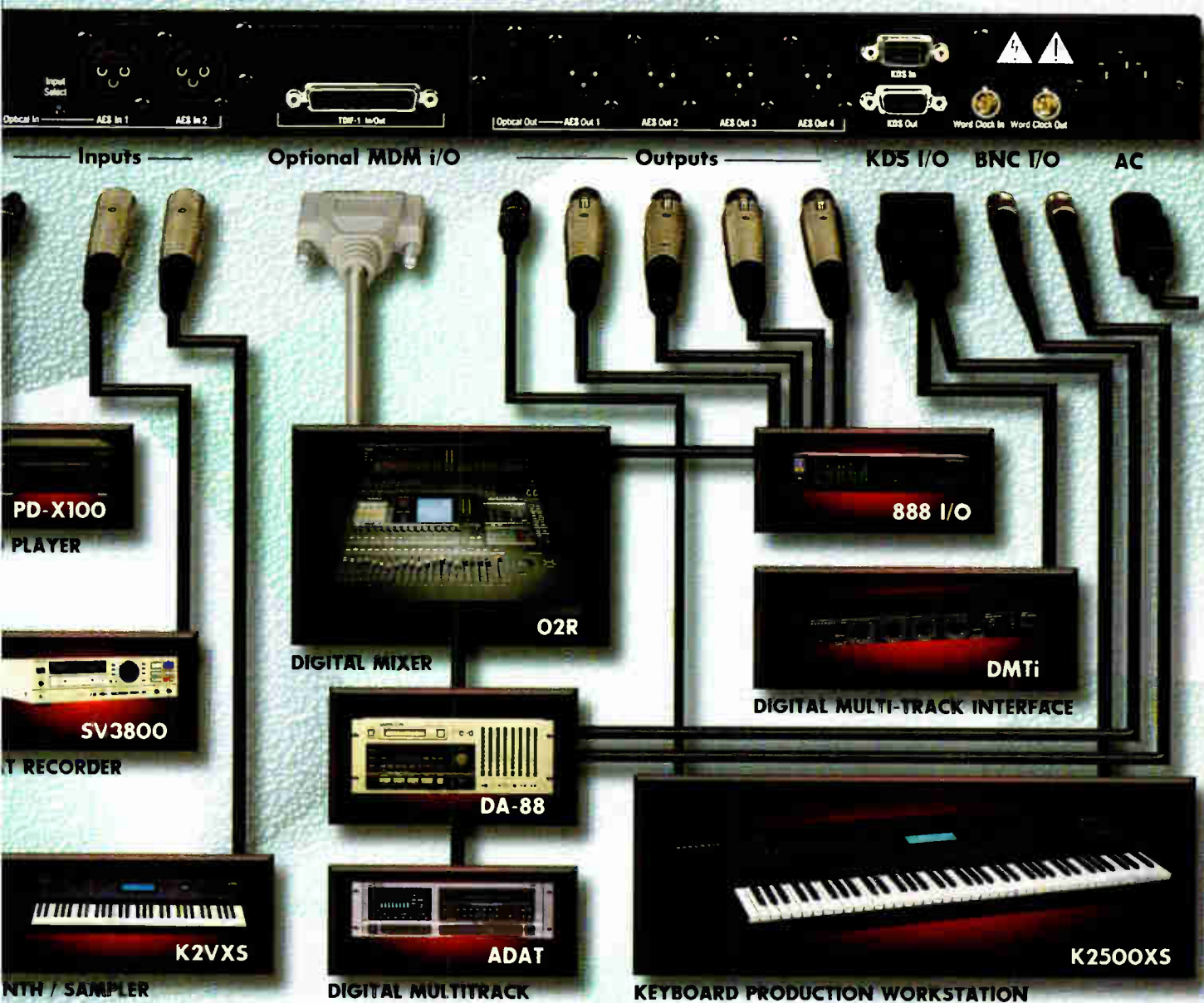
rest of the album, "Baal" is a journey filled with subtle nuances that are atypical of techno and electronic dance music in general. "We work on our arrangements a lot, adding little one-off sounds and breaks to lead the listener onward through our musical maze."

In the microphone department, the duo kept things very simple, using an Audio-Technica Pro 35R condenser mic. Bourke uses this clip-on on his percussion when playing live. "It takes a lot of level and has a huge, warm bass response," he notes. "The only other mic we used was a Neumann U47 which Craig brought to record the trumpet. When we recorded him, he was down at the other end of the house with some headphones on, and I remember being blown away by the sound when it came through the monitors. I didn't have to touch the EQ. I just brought the fader up and the sound was smokin'. Of course, you can't hear that now through all that lovely distortion!"

Unlike more conventional artists, Soma don't consider themselves as having a specified mixing period. "We're mixing as we're writing. Everything is done in our home studio using a Mackie 24-8." Their monitors are Epicure model 5V hi-fi speakers powered by a Yamaha hi-fi amp. "We also monitored on a pair of these shitty Walkman speakers for a bit of lo-fi feedback. For some songs, we ran a mix from the desk, out the window of the studio, down the driveway, into a VW car and pumped it through the cassette player via one of those CD/cassette adaptors. We'd hit start on the sequencer and have to run outside to catch the first few bars of the song!"

Everything ran live off their sequencer to DAT. "Occasionally, we'll print some FX to ADAT, as we've only got the RSP, but we generally use the

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internal FX in the Akais and the 01W." Franc Tetaz (member of the experimental industrial-techno unit Shinjuku Filth) mastered *The Inner Cinema* at Moose Mastering in Melbourne on a Pro Tools III system.

The end result is both captivating and grooving—a hip mixture of electronic and acoustic sounds accessible to many listeners while retaining strong underground roots. This diversity reflects Bourke's own positive outlook on the future of electronic music. "I think it's fantastic that all the possibilities for creating truly unique music exist within the electronic culture," he proclaims. "I hope it doesn't get too restricted or formalized. I'd like to see it explode wide open and reflect the diversity of sound that exists on this planet."

FSOL: SAMPLING THE UNIVERSE

Often labeled as techno, the Future Sound of London (a.k.a. Garry Cobain and Brian Dougans) incorporate ambient and other electronic styles into their work. Their new album, *Dead Cities* (Astralwerks), is, like its highly acclaimed predecessor, *Lifeforms*, a non-stop aural roller coaster, flying through myriad sonic universes, ambient seas and all points between; it's a compelling melange of jungle snippets, ethereal washes of sound and bubbling rhythms.

FSOL don't think of themselves as techno, despite receiving rave reviews in that arena. "I think a lot of people have blocks with dance and techno," explains Cobain, "and I don't think it does us justice, because I think we're one of the most organic bands in the world right now. People are really suspicious about the terminology around my music, but generally when they come across it face-to-face, I'll get a reaction, whether it's from somebody who likes Judas Priest or somebody who likes classical."

The group has evolved from a techno-rock-style band into a more free-form, collage-oriented unit. Once considered an anomaly for wanting to release full-length electronic records to the mainstream, FSOL are now considered cutting-edge innovators. And they're successful, too, with seven Top 20 UK singles to their credit, as well as popular worldwide ISDN broadcasts to radio stations.

Because FSOL's albums are not constructed in a conventional, song-oriented manner, the rules for recording are less rigid, as exemplified by "My Kingdom," a track that can be found on *Dead Cities* and on a remix EP released

last fall. The song originated when Cobain was testing his computer and sampler to see if they were operating, and the first things he picked from his record collection and sampled in were from Ennio Morricone and Ozric Tentacles, which he then manipulated. He played the result to Dougans, who loved it and added in a Vangelis sample. Then they put on the drum track—which was originally designed to be used in a different piece—performed by Richie Thomas of the Jesus and Mary Chain. Cobain says the bass line FSOL came up with was "crap, but when it's buried in a reverb it gives the impression of a bass line that doesn't exist," which pleased them. The other elements brought in for "My Kingdom" included plucked guitars and "bits from weird films and satellite movies."

This song, like their music in general, is an intriguing blend of sounds and samples. "I'm actually quite embarrassed about a couple of the sources on this album," admits Cobain, who finds inspiration in everything from Streisand to Hendrix. "I think to source Morricone and to source Vangelis are too obvious." But there are many far more unusual samples to be found: "We have Oprah Winfrey coughing turned into a snare drum. We've got a lot of stuff from digital broadcast systems. We've got a bit of a track that Brian wrote when he was twelve when he pitched for a British sitcom called *Brookside*."

There are also MIDI files written by avant-garde pianist Max Richter, plucked guitars, and Cobain's and Dougans's voices, including a track with Cobain singing ten years ago. He proclaims it a to be a "very bad track," but when they sampled the best part, "suddenly it made sense."

Despite the fact that they are an electronic band, the duo owns no synths. Instead, they borrow them from other people for their sessions, record the results to DAT and manipulate those sounds later. Their main passion is sampling, and in the studio they are armed with numerous Akais: an S-900, S-1000, S-1100, two S-3200s, two S-3600s, and an S-612, which they bought in 1985 and which has the minute capability of doing two-second samples. "It gives you an appreciation of what you can do with sound in the one-second dimension, which is an important point," Cobain remarks. He attributes the influx of bad dance records in the late '80s to lazy DJs with samplers that gave them up to one minute in sampling time, "and everybody thought 'well, if I've got



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a minute, I'll sample 30 seconds of somebody's track, I'll put it across some drums I've made and make these huge chunks.' Because Brian and I come from these one-second samplers, we knew that there was so much that you could do from snippets, so we built up our whole philosophy on the idea of the snippet of sound and evolving the snippet. And now that we've got S-3200s and stuff, we can treat these things with respect, but we also get a lot from them because we don't have this philosophy of the 30-second mix."

Among the slew of outboard gear in their arsenal are Bel delays, Mid-Verbs, QuadraVerbs, SPX900s, SPX90s, DM1100 delays, Fostex compressors, Midigates, and a device called the Mutator, by Mutronics.

FSOL use Atari 1040 Creator audio software and have delved into Macintosh software as well, but Cobain says they "generally haven't liked it for sequencing." Consequently, they use the Mac for editing, using Pro Tools and Cubase. In mixing an FSOL album, they normally go onto DAT or split up the material onto 16-track ADAT.

As far as microphones, the two say they have no idea what they used on their latest album; they employ the services of a neighbor who is a soundman to make those decisions for them. "Microphones are something we've never really understood," Cobain says candidly.

Dead Cities was mixed onto ADAT (live through Cubase), using the BRC. Despite this modern mixing setup, Cobain stresses that he is not always a fan of high-fidelity audio. "Sometimes if we can make something sound like crap, 'cause it's got character, then that's what I'm interested in," he says. There is certainly no short supply of character in either these musicians or this music. ■

—FROM PAGE 183, RICKIE LEE JONES

explains Reprise president Howie Klein, who was one of the executive producers on the record. "Joe Jackson's song 'Stranger Than Fiction' worked really well, and they just got a good response to it. Same with Nanci Griffith ['It's a Hard Life Wherever You Go']. Same with Rusted Root ['Send Me on My Way']. Same with Shawn Colvin ['Climb on (a Back That's Strong)']. Those were all songs that got a lot of use and that we felt went particularly well on this show. We like those songs; we respect those artists."

Other performers on the soundtrack include Chaka Khan, Syd Straw (whose song "People of Earth" is the album's first single), newcomers Holly Palmer and Laurie Sargent, BT, Howard Jones, Big Bad Voodoo Daddy and—perhaps most memorably—Rickie Lee Jones singing a funky, seductive version of Donovan's "Sunshine Superman." "We called Rickie Lee. We asked her if she'd like to participate, and she said she had worked up a version of 'Sunshine Superman,'" recalls Klein. "She did a rough demo of it for me, and once I played it for the people from *Party of Five*, they said, 'Yeah, let's go for it,' and we asked her to go in and do a real version."

Jones recorded in Conway Studio C in February '96, accompanied by Rob Wasserman on bass, Jim Keltner drumming, Rony Jaffe on keyboards and David Kalish playing lead guitar. The recording engineer was Thom Wilson, whose varied credits include The Vandals, the Dead Kennedys, Madonna, Stephanie Mills and Offspring. "It started out very loose," says Wilson. "I had never met her before, and we really just booked two days to get together and see how it went. We all met at Conway. I'd never recorded at Conway before, though I'd mixed there once."

The sessions got off to a rocky start, partly because of the setup. When Wilson arrived at Conway, an assistant engineer had already placed the mics. Jones was supposed to be in an iso booth, and the drums and the rest of the musicians in the main room. Wilson had his doubts, but he left things as they were until the band arrived, figuring they could make adjustments when he learned what they wanted. Sure enough, the first thing Jones did was to voice her disapproval and rearrange things. "We put the drums in the booth, and we moved Rickie into the room with the musicians, and set it up sort of like her being a solo artist, with her at the center and adding the group around so there was visual contact where everyone could relate to each other."

Conway Studio C is equipped with a 60-input Focusrite console and two-way TAD main monitors. Wilson recorded on a Sony 48-track digital machine. He captured Jones' vocal with an AKG C-12 microphone, through a UREI 1176 limiter—another point of contention. "She had a predisposition about limiters recording her voice," explains Wilson. "She didn't philosophically want to use one, and at one point, things kind of ground to a halt. So she

and I got together to talk about it, and I explained my position. I thought limiters would help her a lot. Using a limiter judiciously, you can make her whole performance very listenable. The way she sings, she has a very wide dynamic range, and it's really not ever the same way twice. Only about 20 percent of what she was singing was really in the optimal range dynamically. A lot of stuff was way too low, and then it got very loud. Also, she and I weren't in tune enough yet where I could anticipate what she was going to do. I had to take a more conservative approach, because especially with digital, if you go too far in terms of gain, it gets very ugly. But once I explained my position on that, everything lightened up, and it was really cool."

The song was mixed by David Cole, the engineer who, at press time, is working with Jones in Conway on an upcoming album. "From my experience with Rickie," Cole says, "she may have a handful of songs that she wants to go in and record, and you pretty much have to roll tape and catch it as it comes. There's no 'Okay, we're going to start recording now.' She'll turn around and look at the control room and say, 'Okay, let's hear that back,' and you better have it on tape. Or she'll finish a take and she may go right into another version of it, another take at maybe a different tempo, a different feel, a different intro, or she may just start singing another song. She might start doing a cover song, an oldie or whatever strikes her at the moment."

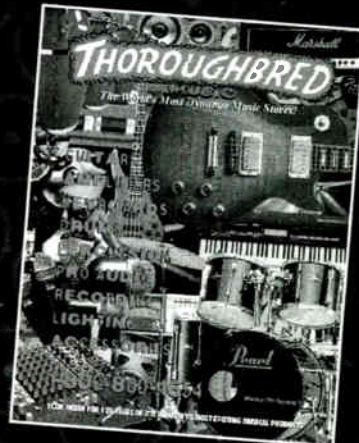
During the mix, Cole and Jones repaired parts of a verse Jones had forgotten the words to during the original take, and added background vocals. Then, a week later, Jones came up with some more ideas she wanted to incorporate, so she and Cole remixed the track, this time in Ocean Way Studio A because Conway was booked. "We had done our mix on the Focusrite with the GML system over at Conway," explains Cole, "and Oceanway has the same Focusrite board, but the older GML system. I found out after we booked Ocean Way that you can't just take your mix from the Conway GML system, which is the new Macintosh-based, and walk into the old system and drop your disk in. I had to get George Massenburg out of bed—George, help!—and he personally converted the data for me, so I was able to get it up and running. George is awesome.

"The mix we started with was fairly

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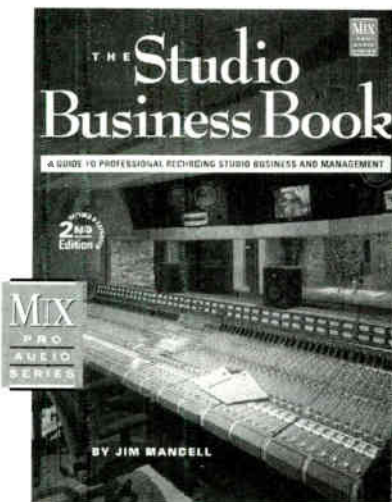
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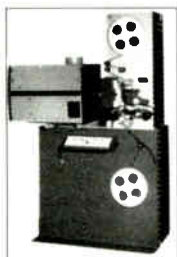
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organic and honest in terms of what was played on the floor at the time of the recording," Cole continues. "She wanted to push the barriers in the remix, so we put instruments through wild effects and drastically changed the character of it. We compressed a bunch of things. That's the mix she was happy with."

Cole says the new album is going slowly but well ("We're chipping away at it."), and he feels lucky to be working with Jones at this stage of her career. "She's in a very good space personally right now," he says. "She's engaged to be married. Her daughter comes by the studio a lot. We, often times, take a break so she can go pick her daughter up at school. She's got a good balance in her life, and I think it reflects musically. She's very upbeat and has a lot of fun in the studio." ■

—FROM PAGE 183, PHIL COLLINS

was, for the most part, a very sad record with highly introspective songs about his impending divorce. "There were definitely some songs that were predicting what would seem to come next, which was the problems inside my personal life," says Collins of *Both Sides*, which he still insists is his favorite solo LP. "But, I'm gloriously happy now. That doesn't mean I wasn't happy before. I had a great marriage for a long time, you know? I don't want to do Jill discredit by saying I'm happy now, because we had a great relationship for a long time. But, when bad things happen in life, one has to do something about it. And I went through a little down time and now I'm out of it."

Dance Into the Light is a different type of solo record for Collins because it attempts to fuse his divergent interests in the classic '60s pop song, heavily rhythmic African music, and the sparse, ambient grooves he previously explored as a member of Genesis and session player for Peter Gabriel. What Collins and his co-producer/engineer Hugh Padgham have delivered is a collection of infectious pop songs in a wide variety of musical settings. Imagine a marriage of classic Byrds and Beatles ideas with the music of Johnny Clegg and Peter Gabriel, and you might have an idea what this project is like. Not surprisingly, some critics have accused Collins of borrowing too heavily from the African trademarks of his friend Peter Gabriel and, of course, Paul Simon, but Collins dismisses this criticism.

"What disappoints me," he says, showing some obvious annoyance, "is that everybody's knowledge of African music seems to begin and end with Peter Gabriel and Paul Simon. For music critics to have that limited philosophy and mentality is kind of sad. After Paul Simon, suddenly nobody else can touch anything with kind of tribal drums, you know? I know where my music came from, and it wasn't [Simon's album] *Graceland*. I don't even own a copy of *Graceland*. To be quite honest, where I took my inspiration from was Y'ssou N'Dour [who has a long association with Peter Gabriel]. He, and a few other African singers, are the guys that I was listening to that rubbed off on my album."

Dance Into the Light was recorded over a nine-week period in a large rented chateau in France, just over the border from Switzerland. Collins and Padgham borrowed and installed Sting's portable recording setup, including an automated SSL console and 48-track Sony digital and 24-track Studer analog recorders. The musicians on the project, which included longtime friends and colleagues such as bassist Nathan East, guitarist Daryl Stuermer and keyboardist Brad Cole, stayed in the chateau's nine bedrooms, while, Collins says with a smile, "I could go home every night, because Switzerland is just across the border from France. So, we did it in France."

"It was a very old chateau," he continues. "We moved the studio in the dining room. There's basically three dining rooms on the ground floor; all of them had these spectacular views of the Alps. We put the desk into the big one, and then we had most of the other equipment and machinery and fans in one of the far dining rooms. On the other side of the big dining room we had the drum room, which was a very large library/dining room. Like a library, it had glass in it and lots of books. It was a quite large, reflective room. We did some of the vocals in there, too. Sometimes we did the vocals in the actual control room where the desk was. We did the horns upstairs in a slightly dealer room. We just used all the rooms we had available to us."

The new album represents a reunion of sorts for Collins and Padgham; the noted producer/engineer worked on some of Collins' earlier solo records, as well as albums by Genesis. This time, however, both men shared producing and mixing responsibilities. "It was great to work with Hugh in the studio once

again," Collins says. "We got on great. He understands what needs to be done."

Collins says he spent more than six months writing and recording the tracks for *Dance Into the Light* because it was important to have his first post-Genesis project be a strong musical statement. "I decided halfway through the writing and recording of *Both Sides* that I was leaving Genesis," he says. "We did a gig in England, a charity show for a hospital, with us and the Floyd, Queen and Clapton. We had a five-song set, and halfway through the set, I suddenly felt the shoes didn't fit any more. I wasn't being true to myself. I was playing a part, being an actor, you know? So, I came offstage and I thought, 'Well, that was interesting!' And, I went home and thought to myself, 'I think that's it! You know, I think I really have had enough now.' I kind of felt better for it in some respect. I felt like a weight was off my shoulders."

"I had a meeting with the guys, and they were a little disappointed but they understood, because it could have easily been them saying this. We've all been in the band for 25 years, and we've all felt at times to do something different. I came to the decision maybe a little bit ahead of everybody else. But they had said that they are going to carry on, and they're in the middle of recording an album right now, with Ray Wilson as the new singer."

Ironically, now that Collins is out of Genesis, he feels that a reunion of the original members is more likely than ever. "Yes, I think more than likely it could happen," he says. "I think with the Genesis box set coming out in 1997, I think some bright spot will have the idea of doing some kind of benefit or charity show and filming it with the original guys."

"Peter [Gabriel] has already gone back into the studio with Tony [Banks] and Mike [Rutherford] to re-record some vocals from the live version of 'The Lamb Lies Down on Broadway,' which is part of this box set. I've seen Peter many times and we love each other, and Peter and Tony and Mike have seen each other many times. There's never been any animosity between the four of us. And, in fact, between Steve [Hackett] and the rest of us. So I feel sure that whilst I wouldn't go back and be the singer of the band any more, if someone said to me, 'Do you want to get behind the drums and play behind Peter?' I'd do it in a moment's notice!"

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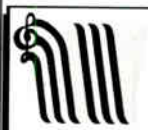
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CINRAM ACQUIRES DMI

Quixote Corp., parent company of CD replicator DMI, accepted an offer from Canadian duplication/replication giant Cinram to acquire DMI's operations, including plants in Anaheim, Calif., and Huntsville, Ala. The \$80-million transaction, which was expected to be completed by the end of February, brings Cinram up to a total of five plants in North and Latin America, with a combined capacity of more than 400 million CDs annually, as well as DVD mastering and replication capabilities.

LACERTA RECYCLES MAGNETIC MEDIA

Lacerta Group Inc., a Boston-based recycler of magnetic media, is opening a new, expanded facility. According to the company, Americans "consume" more than 1 billion prerecorded cassettes (audio and video), 1 billion computer diskettes and 350 million blank video cassettes each year, not to mention data cartridges and 9-track computer tape. The company specializes in the "demanufacture" of these products into their component parts, allowing recovery of materials for re-use. According to co-founder Ali Lofti, the new facility will allow the company to "positively impact the environment by removing about 40 million pounds per year of materials from the waste stream."

KAO AND PCSW TEAM FOR DVD

CD replicator Kao Infosystems Company and mastering/multimedia house Pacific Coast Sound Works announced a partnership to offer DVD production services in West Hollywood, Calif. According to Kao's Jim Boyer, the facility is targeted toward content creators and owners who have not invested in their own in-house DVD production facilities. The studio features the DVD Creator from Sonic Solutions and will emphasize "one-stop shopping" by tying together



Ali and Mory Lofti, principals of Lacerta Group Inc., recycle magnetic media and components for all types of businesses and industries.

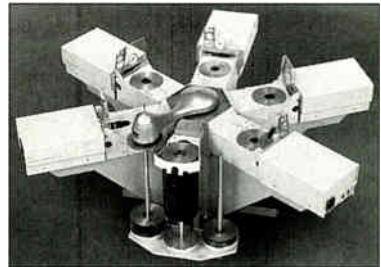
PCSW's premastering/production capabilities with Kao's replication, packaging and fulfillment services.

CD-R OFFERINGS EXPAND

With the CD-R growing in popularity and becoming more of a commodity item, drive vendors continue to look for ways to distinguish themselves from their competition. At the low end of the market, this translates into major manufacturers offering faster drives at lower prices. At the high end, value-added resellers are targeting the nascent market for CD-R duplication, adding disc-handling automation and other features that make it practical to crank out multiple copies with fast turnaround times.

Among the duplication-oriented products is the Power Tower series from Revelation Products (Valley Forge, Pa.), a Windows 95/NT based system allowing simultaneous transfer of digital or analog source material to up to 16 recording drives at 4x speed. From Solstice Technologies (Eden Prairie, Minn.) comes the AutoRecorder Series 500, capable of managing runs of up to 50 duplicates from one or more source masters, including four-color printing of labels and inserts. The system reads from source masters at 4x speed and writes at 2x or 4x depending on the model. Another automated system is avail-

able from the team of Young Minds (Redlands, Calif.) and CopyPro (Concord, Calif.); their CD-R 5000 allows unsupervised recording of batches up to 400 discs.



Microtech's automated CD-R disc handler

Microtech Conversion Systems also has a CD-R duplicating system, offering both the Imagemaker CD-R for recording and the ImageAutomator for physical disc handling. The ImageAutomator uses a modular approach built around a core of one module for handling disc I/O and one for servicing a drive. Up to four additional modules for drives or printers may be added. The company also offers Freud, an integrated 8x media analyzer/tester.

Two new systems are now available for DAT to CD-R conversion. Microboards Technology (Channahon, Minn.) is offering the AD Maker, which includes a high-density DAT drive, a 4x recorder and two SCSI channels and features an audio transfer mode. Meanwhile, MediaFORM (Exton, Pa.) has the DAT-PAK, which works with the company's CD-4400 CD-R record-

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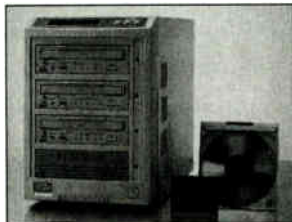
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Among the familiar single-drive desktop units, Yamaha has added to the downward momentum in prices by lowering the list price of its 4x read/write units, the CDR100 (internal) and CDE100 II (external), to \$849 and \$949, respectively. And Ricoh is now offering the CD Replicator, a 4x read/2x write model with a 2MB buffer, at a suggested retail of \$499.

SPLICES

Fat Tracks Recording (Austin, TX) installed a Neumann VMS 66 cutting system and now offers mastering services for LPs and singles...Robert Vosgien of CMS Digital (Pasadena, CA) mastered the latest offerings from Shaquille O'Neal and Bush...At San Francisco's Rocket Labs, Paul Stubblebine mastered recent releases from John Lee Hooker and the newly reformed Jefferson Starship, while Ken Lee handled projects by Box Set and rapper Mac Dre...Sega chose Music Annex (Menlo Park, CA) to master the CD version of the video game *Mr. Bones*, featuring music by Ronnie Montrose...At Tower Mastering in Hollywood, CA, Wally Traugott mastered new albums by the Presidents of the United States of America, Julio Inglesias and Lee Ritenour...Joseph Yannece mastered a new release by jazz masters Benny Carter and Phil Woods at Trutone in Hackensack, NJ, where David Radin handled mastering on two *Tropijazz All-Star Live* albums featuring, among others, Tito Puente and Hilton Ruiz...Time Capsule Mastering in Long Beach, CA opened a second room built around a Sonic Solutions mastering system...At Future Disc in Hollywood, CA, Steve Hall mastered the latest from

George Carlin, Chris Isaak and Chaka Khan, while Tom Baker handled recordings by Ellen Degeneres and Danzig...New York City's Digital Force handled production and printing chores on a special promotional CD for the national tour of *Sunset Boulevard*. HHB Communications (Portland, ME) announced that CEDAR Audio's DH-1 De-Hisser for steady-state noise removal has been superseded by the new, improved model DH-2...Targeting both audiophile and professional applications, Esoteric Sound (Downers Grove, IL) introduced the \$450 Surface Noise Reducer, which is claimed by the company to offer 70% to 90% effective click and pop reduction on LPs and 20% to 40% on older phonograph records...



Apogee Electronics' Master Tools CD-mastering kit

Apogee Electronics (Santa Monica, CA) announced the availability of a PCI-compatible version of the Master Tools plug-in (which includes UV 22 processing) for Pro Tools...Eagle Team distributors in South Africa has purchased a DB1000 digital master reproducer from Telemetrics (Campbell, CA), as well as six 1500 Series high-speed cassette-duplicating slaves from sister company Versadyne and three loaders from Concept Design (Graham, NC)...Sound Communications Publishers in Leeds, England, is the first duplicator in the world to install the μ MAX digital bin from Gauss (Sun Valley, CA). Gauss also sold the first European installation of its DAAD R² bin using a CD-ROM-based loading system. The company also announced the sale of QC systems to Tape Specialty (North Hollywood, CA), The Teaching Company (Springfield, VA) and Digital Excellence (St. Paul, MN), as well as duplicators in South Africa and India...Saki Magnetics announced late-1996 sales of cassette-duplicating heads to 20 U.S. duplicators and ten duplicators overseas, making December a near record month of replacement head sales for the company...Otari (Foster City, CA) announced a new in-cassette audio duplication system, the DP-8. The 16x system features ferrite heads and a brushless, slotless direct drive motor running four independent capstan drives. ■

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COAST TO

L.A. GRAPEVINE

by Maureen Droney

Pacifique Studios in North Hollywood has become the third L.A. facility to install an SSL 9000 J Series console, and the first U.S. facility to install one with the DVD (Digital Versatile Disc), or 6-track surround sound, monitor system option. I stopped in at the Magnolia Blvd. facility to visit with the owners, the always amiable Deranteriasian brothers, engineer Ken and studio manager Joe, and for a look at the new console and the accompanying Studio A upgrades.

In operation for 11 years, Pacifique's core business has been built on its reputation for reliability; it's perceived as a comfortable, no frills, no down time facility. Being family-

—CONTINUED ON PAGE 206

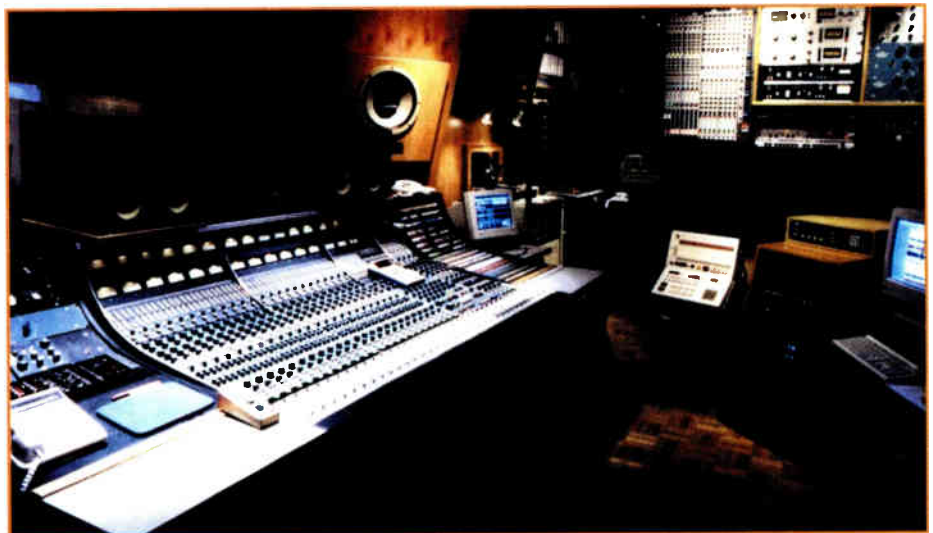
Below: Producer Andre Fischer (Front) and engineer David Rideau at Pacifique's SSL 9000 J during sessions for RCA artist Vanessa Rubin



NY METRO REPORT

by Dan Daley

Like harbingers of spring, a new round of large-format consoles are moving to town. The immediate response is that business must be good at the high end, and that does seem to be the case in many instances. Another interpretation, though, is that this is part of the larger phenomenon of upper-echelon studios refurbishing



Above: The revamped Studio A at Acme Studios in Mamaroneck, N.Y., features a vintage Neve 8058 with Flying Faders and classic EQs and compressor/limiters. The room includes custom near-field and main monitors designed by Ted Jensen. Also new at the studio is on-premises lodging for artists and producers.

upward in an attempt to differentiate themselves from the ever-widening lower tiers of the pro audio pyramid.

Either way, the count has grown substantially in recent months: Chung King's new rooms downtown have new Neve V3 and VR consoles, and Right Track has added a new Neve VX. Electric Lady bought an SSL 9000 that was installed in early January. Quad Recording added a second 9000

—CONTINUED ON PAGE 204

COAST

SESSIONS & STUDIO NEWS



This is the main tracking room at new West Palm Beach, Fla., studio Creative Music Recordings. Designed by owner Marilyn K. Seits and Fernando Levi in consultation with Ross Alexander, the facility is equipped with a Trident Series 65 console, a Studer A80 24-track analog recorder, and monitors by Westlake and Dynaudio Acoustics.

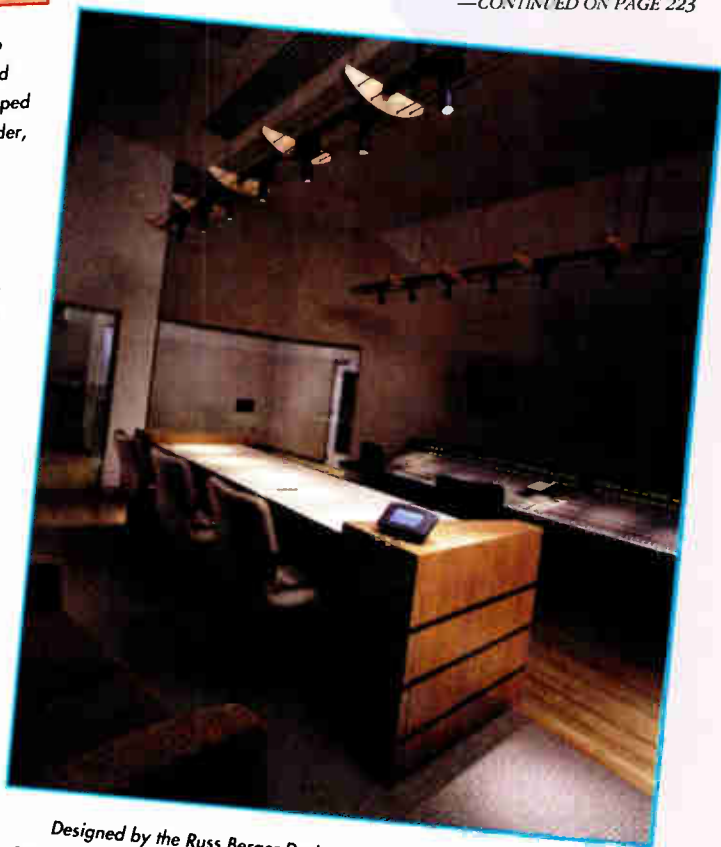
SOUTHEAST

Leading New Orleans facility Ultrasonic Studios recently celebrated 20 years in business. The studio has recorded multiple Gold, Platinum and Grammy Award-winning albums...Chris Duarte tracked for Silvertone Records with producer/engineer David Z and assistant Matt Andrews at Sound Emporium Recording in Nashville...Nashville's Masterfonics had Clay Walker in mixing for Giant Records with producer James Stroud, engineer Julian King and assistant Ricky Cobble...Criteria Studios in Miami had producer/engineer Hugh Padgham in remixing for the forthcoming Bee Gees release with assistance from engineers John Merchant and Chris Carroll...Producer/engineer Brendan O'Brien mixed the new album from Zoo artist Matthew Sweet at Doppler Studios in Atlanta. Blake Eiseman assisted...Recent sessions at Mcmix Production Services (Smyrna, GA) included gospel producer Steve Twyman working on Harold Holloway's debut for Adore Thee Records. Don McKinzie engineered...Yellow Jackets bassist Jimmy Haslip worked on saxman Warren Sneed's new release at Houston Sound (Houston, TX). Mike Morrison produced...The Thompson Brothers Band tracked and overdubbed with producer Bill Lloyd (of Foster & Lloyd), engineers Mike Purcell and Rob Feaster, and assistants Dennis Cronin and Paula Montondo at The Castle in Nashville...

SOUTHERN CALIFORNIA

Chaka Kahn mixed a track for the Joni Mitchell tribute album at Scream Studios (Studio City) with producer Larry Klein and engineer Tony Phillips...Producer/engineer Sylvia Massy tracked Rod Hot Chili Pepper Flea for his solo Warner Bros. release at Sound City Studios (Van Nuys). Greg Fidelman assisted...Thrash metal band Epitaph worked on a Chainsaw release at Studio West in San Diego with Norwood C. Barber II engineering and producing...Metal marathon man Ozzy Osborne mixed a new Sony release at Skip Saylor Recording in L.A. with producer Mark Hudson, engineer Adam Kasper and assistant Rod Michaels...Ugly Beauty worked on their Atlantic debut in

—CONTINUED ON PAGE 223



Designed by the Russ Berger Design Group, Atlanta's Silent Sound Studios offers an SSL 4064G with Ultimition, Northwest/TAD monitors, two Studer 827 multitracks, and a complement of Lexicon gear including a 480L, two PCM 70s, a PCM 80 and 90, and a 500T.

Nashville Skyline

by Dan Daley

The modern country music industry in Nashville started with record label-owned recording studios, such as RCA's two facilities and the former Quonset Hut, built by Owen Bradley and later owned by Columbia Records. But by the mid-1980s, no label owned a studio in Nashville any longer, a trend that had also occurred in New York (where Columbia and RCA sold off their facilities in the mid-'80s) and to a lesser extent in L.A., where Capitol still owns its studios. But late last year, a Nashville-based label once again became the owner of a recording studio when Curb Records Group purchased the former Sessions studio across the street from Curb's headquarters on Sixteenth Avenue South.

The studio, built in 1982 (and which earlier had been the original home of Star Gem Records—one of the first mail-order record businesses in the U.S.) is now home to productions for Curb Records acts, particularly those produced by Chuck Howard, Curb's VP of A&R and producer of a number of country acts including LeAnn Rimes and John Berry.

According to studio manager Leslie Albert, Curb's studios will be available for outside rental, but on a very limited basis. "We're not nixing any options, but we're trying to prevent renting to outside clients," she says. Curb Studio's daily rate of \$1,500 per day will contribute to that, she adds.

The studio is a single-room design and hasn't changed much in more than 20 years. The two hut-like iso booths and carpeted walls harken back to the "dead" days of Nashville, and Craig White, an independent engineer who works often with Howard, says he and others like it that way. "It's pretty dang dead," he says, "but that works fine for us. The drums aren't quite so loud, but there's not a lot of ringing on fade-outs. We're digging it. It's kind of retro." So was the studio's first session under Curb management last October: country classic Eddie Arnold.

The studio's technology has been updated somewhat—the studio has the first commercial installation of a Euphonix CS2000 console, as well as the largest at 104 faders (it replaces an MCI console). On the other hand, the studio is sticking with the Mitsubishi X-850, the longtime Nashville digital format that is

giving way to the DASH platform (and that, White laughs, will help keep outside clients from wanting to book time there). The studio is also keeping the JBL 4435 main monitors, which received new components. The studio was completely rewired, and the interior remodeling was done by studio carpenter Dave Mattingly.

Battery Studios has joined its Neve 8078 with another 8078 to create a 64-input hybrid board with GML automation. Interestingly, both 8078s were originally custom-built for the now-defunct Media Sound in New York. The second board was most recently owned by former A&M Studios co-owner Shelley Yakus. According to Battery manager Lee Groitsch, the second Neve was purchased from Yakus in mid-1995 and has been on the waiting list for Neve specialist Fred Hill to perform the marriage. Installation was expected to take place in February. Groitsch says that he pursued the hybrid to increase the attractiveness of the studio to clients outside of Nashville, and that he hopes to raise day rates at Battery between \$150 and \$200 as a result.

Seventeen Grand Recording was scheduled to open its new second control room by the end of this month. The room, which uses the adjacent space formerly occupied by a travel agency, is equipped with a Neve V3 and Quedsted monitors. It's aimed at the upscale mix and overdub market, according to co-owner Jake Nicely, but is priced at \$1,200 per day to differentiate it from control rooms that are accompanied by large studios. "You're paying for a nice control room with a large (19x12x14) iso booth but not paying for a large recording space that you don't necessarily need for mixing and overdubs," explains Nicely, who also designed the room, which was built by Mike Cronin. The new room will have its own Studer 48-track digital deck and its own lounge and will be configured for surround, LCRS and THX mixing formats.

Sound Kitchen will open three—count 'em—three new rooms at its Brentwood facility by August. Co-owner Dino Elefante said the new rooms would include a 50x50x22 tracking room with seven iso booths and two new overdub studios. Two of the rooms will get Neve consoles—an 8108 and a V3 that Sound Kitchen already owns. The third console has not yet been determined. The tracking room will have motorized walls allowing ambient changes, part of the design by Chris Huston (Andorra, Enterprise).

Not so far afield: Tom Backus moved his two-year-old audio post-production company, Complex Audio, from Rochester, N.Y., to Knoxville, Tenn. Sick of the snow and the increasingly routine corporate work that Rochester offered, Backus started working with a friend on Hooters restaurant spots out of Knoxville, and once Complex Audio was in place in an office complex that includes other companies offering video and film production and editing, Backus' workload diversified to include regular national projects for A&E, HGTV and Scripps-Howard.

"Changing locations also changed the kind of work I was doing, from corporate to television," says Backus, who uses a Microsound Technology DAW, Tascam DA-88 digital decks for layoff, and a Mackie 32-bus console. But Backus also maintains ties to the old country: He recently went back to Rochester to record and mix a 45-piece orchestra for a Kodak industrial score. Just down the road from Nashville, Backus says he thinks about the town, but that its audio post base has not grown enough yet to consider moving there. "It's growing, but it's still such a music video town," he says. "There's no surround mixing facilities for film there yet, so I go to New York, L.A. or Toronto for that." ■

Send Nashville items to danurwriter@aol.com, or fax to 615/646-0102.

—FROM PAGE 202, NY METRO REPORT

into a new room designed by owner Lou Gonzales. And Room With a View replaced its SSL G with a 9000 in February.

Gonzales, who put a 9000 in his new room late last year, says that the progression is limited to a narrow band of upper-end studios in town. "Those are the studios that have hit the cycle point, and I'm happy to hear that," he says. "I think it's telling us that people are ready for better quality, and the upper-end studios are the only ones that can afford to give it to them." Gonzales also says that he was able to raise rates by about 20% soon after installing his first new 9000 in early 1996, and that he has had no problem keeping to those new rates. However, he concedes, he does often have to provide a free day as an incentive to get new clients to try the rooms and the consoles. "But that's a sort of loss-leader that in the end really works,"

—CONTINUED ON PAGE 208



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—FROM PAGE 202, L.A. GRAPEVINE

run has allowed for a very hands-on approach that has kept costs down and quality up. For example, "We sold the Trident that was previously in Studio A to [former Guns N' Roses guitarist] Slash," says Joe, "and when his engineer saw the board he couldn't believe it was ten years old, because it was so clean. He pulled out modules and looked at them—no dust, nothing. We don't allow people to smoke in the control room, and every six months we take out and clean the faders. That's one of the reasons people like it here—we really maintain our equipment and keep ahead of any potential problems."

The decision to purchase the 80-in desk couldn't have been an easy one—there aren't a lot of new console acquisitions these days. "I think people now are confused about whether to get digital or analog when it comes to purchasing a console, and they don't want to make that decision yet," muses Ken D. "In our case, our time was up to buy a new board, and SSL has the best sound and the best reputation. We considered a digital board, but we do tracking here as well as mixing, and I, personally, believe that the current digital boards are too complicated for that. They are not yet ready for tracking.

"We just finished recording a live band on the 9000 for jazz singer Vanessa Rubin," he continues, "and, to our surprise, they hardly used any outboard preamps at all. The 9000 sounds so transparent, they didn't feel they needed them. The top end is clear and airy, and the bottom is nice and full. So now we are thinking that we can move a couple of our Studio A outboard preamps next door (to the Neve VR-equipped Studio B), because it seems like we don't need as many in A."

Andre Fischer, known for his work with Natalie Cole and Brenda Russell among other artists, was the producer on the Vanessa Rubin sessions. "I've worked on SSLs before," he comments, "but this was the first time on the 9000. I'm a 'prove it to me, show me' kind of person—I started on API, and I've worked on Neves for quite awhile, and I've pretty much used them as my yardstick. My preference is analog sound, and I use a lot of old tube mics. When I first used an SSL, the G Series, I used 30 Pultecs, and all I used [from the console] was the brains for the automation—I bypassed it almost totally. I always saw that the hip hop and rap guys liked the SSL because it was punchy. But for the kind of sounds I heard,

Neves worked better for me. Dave [Rideau, engineer on the Rubin sessions] would keep telling me 'You're wrong, Dre,' and finally he said 'You've got to check out the 9000.' So I went over, put up a 2-inch and AB'd with the Neve next door, and all of a sudden it starts sounding real quiet to me, real good, and the more I get into it, the better I like it. For Vanessa we recorded about 75 percent of it live, with Harvey Mason on drums, Patrice Rushen on piano, Dave Carpenter on upright bass and Ramon Stagnaro, a great acoustic guitar player. And, I have to say, with the 9000 I was a bit frustrated because I was done too quick! I've just scratched the surface on it, and I want to get back on it with another project to get into the full power of the board. I was really happy with it."

Queried on how easy it was to get familiar with the console and its computer, Fischer answers, "There is a little learning curve, so it was helpful to have Patrick MacDougall from SSL there when we needed him. He was great, and it helped make the session go really well."

Engineer Rideau concurs. "They were fun sessions. The console was easy to learn, but there were some key points that Patrick really helped on. Both Andre and I have always liked working at Pacificque—the non-factory-like, family-owned approach is rare these days. All of their purchases have always been very wise, but I have to admit they surprised me with the 9000. It was the first time I'd worked on one, and it's official for me now, I'm a fan. I used Avalons (preamps) on the overheads, and a Neve 1073 on the kick, but other than that, we used the board preamps. We do live vocals, and sometimes it turns into a master, so I needed to get a great sound on Vanessa while we were tracking. We put all her leads straight through the board, and I was quite impressed. SSL was always convenient but it was never one of the great-sounding consoles until now."

Ken Deranterasian also spoke highly of SSL's support team. "It's a bit of a different attitude than we are used to. [At SSL] they ask engineers what they want and keep trying things. For example, you can use the J computer in several different styles, similar formats to other moving fader systems that people may be accustomed to. There are different modes, and you can ask the engineer 'What style do you want to use?' and give it to him."

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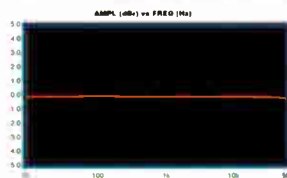
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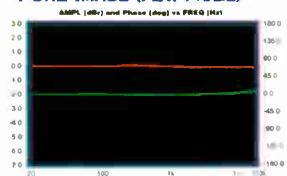
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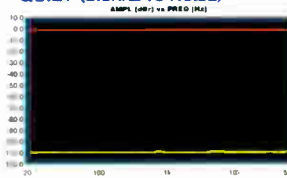
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World Radio History

that Pacificque chose to add, looking toward future work in post-production, and current formats such as DTS, SDDS and Dolby Surround. Phil Wagner, SSL's VP of Western Operations, described the module. "It's a neat little package that sits in the middle of the console and expands the normal 4-track LCRS monitor to a 5.1 or 6-channel monitor. The patch points and metering are all in place, and it allows you to elegantly switch between 4- and 6-channel monitoring to enhance rapid session changeover between formats. Clients don't want to get to a session for a 9 a.m. downbeat to find the studio still playing around with patch cords, speakers and cables, doing a balancing act. Pacificque, along with some of our other clients, have said, 'We want to do it the right way, so we can just push a button at 9 a.m. and the console is configured for whatever the client needs.'"

Construction on the studio was completed by a combination of the Pacificque crew and SSL's technicians, with all wiring consisting of Mogami cable. Sessions were running during the whole process in Studio B—as a matter of fact one session was drafted to help. "One day," laughs Joe D, "we needed some help to move the new console a few feet away from the wall. We had four workmen, but it wasn't enough, so we asked the producer and engineer working in B if they would help and they did. Of course I bought them lunch." Well, we did say they had a family atmosphere!

The room comes with two Studer A820 analog 24-track tape machines, a Marantz 620 CD Recorder, Lexicon 480 and 224, a Neve 33609, a Summit compressor, Manley, GML and Joe Meek Stereo compressors along with API EQs and preamps, and four Neve 1073s, Demeter, GML and Avalon preamps.

As for rates, well, says Joe, "We are going to compete. Competition is the name of the game." As for amenities, he says, "Whatever they need, they have it, or we'll get it for them. People come here to do work, serious work, and we help them to do it."

Over on the Westside at Jackson Browne's GrooveMasters Studio, producer Ed Cherney was getting started on a new Jann Arden record. And yes, the facility is open to outside projects. You just have to call well in advance to book the Neve 8078 room. The complex, which has evolved over ten years, features a large, 28x28 control room, a main recording space that is approximately 28x40 with 12-foot ceilings and

a 12x12 lounge/iso booth, along with offices, a shop and a kitchenette.

Ed Wong is GrooveMaster's general manager, and he has overseen many incarnations of the developing studio. The first, in a downtown (!) L.A. warehouse was the recording site for Lawyers in Love in 1982. After that the operation moved to Browne's house, and then finally settled on this nondescript Santa Monica block. First set up to store equipment and as a place to rehearse and to record those rehearsals, GrooveMasters has, over the years, established its own comfortable vibe. The 40-in 8078, which came from Angel Recording in London, is fitted with Flying Fader automation and has been installed since 1990. The mains, UREI 813Cs, are powered by Manley Reference 350 Monoblocks, and near-field speakers include Mastering Lab, Manley, Tannoy, Genelec and of course Yamahas and Auratones. There are two Studer 24-tracks, (A80 and A800) Studer and Ampex ½-inch, 24 channels of Dolby SR, and a killer mic collection.

Wong, previously an engineer with Santa Barbara Sound, started working for Browne in 1982 when he was hired to wire up a console for the downtown studio. "It was supposed to be a two-week job," he laughs, "but I never went home." One of the good points about being an artist-owned studio rather than a straight commercial facility is that bottom line is not as much of a determining factor. "The purchases we make," explains Wong, "are not just to support a business, but to enable Jackson to get the sounds that he wants for his projects, his own records or ones he is producing. As we built this place, and as we equipped it and acquired more gear, we realized that other people would like to work here, and that helps pay our way. We are into the discrete, tube, analog sound, and fortunately for us a lot of other people out there are also into that sort of sound. So we are able to sell the time that he doesn't use, and it works out well. It's difficult to say how much time we'll have in any given year to book outside projects, but sometimes there is quite a lot. Last year, for instance, Jackson pretty much toured all year so we were able to book ourselves up. As far as finding out about us, it's all been word of mouth. As far as booking time, it's like any other studio. If you are organized and can book your time in advance your chances are better."

The vibe of the studio definitely reflects its owner's sensibilities, from the artwork, guitars and vintage radios on

display to the socially conscious direction. "We are very serious recyclers here," comments Wong. "The materials we use and how they are disposed of are very important. And our earthquake preparedness here is very high; we pay attention to those kinds of things." Oh, and no phone in the control room—seems like a simple idea that a lot of producers and engineers will appreciate!

If you want to see the studio for yourself, pick up the enhanced CD of Browne's last record, titled *Looking East*, for a virtual tour—in fact, a much better tour than mine, because you can click on almost anything in the room (patchbay, limiters, mics, etc.) for a mini explanation spiced up with comments from Browne and friends. It also includes pictures of the musician and mic setup for the album and a very cool timeline of the musical development of one song, from its inception as a sound check jam to rehearsal, to basic tracks and final mix. Check it out! ■

—FROM PAGE 204, NY METRO REPORT

he says. "I think New Yorkers expect that sort of thing, anyway." Gonzales also says he will have to monitor the upgrades in New York more carefully in coming months. Part of the new second room's intent is to keep overflow from leaving Quad. "Last year, when I couldn't accommodate a client's schedule, they went to Los Angeles or Nashville," he says. "I didn't lose any business to New York studios. This year, that might be different."

Alessandro Cecconi, president of Room With a View, added an SSL 9000 early this year, timing the new technology market, as many studio owners do, to maximize cost-effectiveness but still try to stay on the edge of the equipment curve. "For us, the decision was pretty simple," he says. "We saw a new technology coming, we waited until the bugs were worked out and then made the jump, to be ahead of some of the other studios. Room With a View has specialized itself as a mix room, and as such we need to have all the toys to offer to our clients."

As for rates, Cecconi says that he's increased them slightly, but that move is based more on service than technology. "We have seen that the client will not pay more money for equipment, but will pay for service," he observes. "A good assistant, a great recall package,

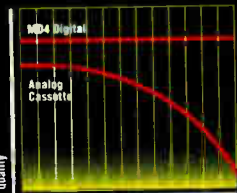
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STUDIO SHOWCASE



Gallery Recording Studios

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e-mail: gallery@bbhinc.com

It's a recording studio and an art gallery! A beautifully designed new, spacious facility with outstanding acoustics, based in the heart of Manhattan. The best in vintage/modern gear and an inspiring atmosphere enhanced by ever-changing exhibits of striking modern artwork. Built to spoil the most demanding engineer, producer or musician. Some names: 148-in Trident 90 console with moving faders, Studer 827s, Lexicon, Quedsted, Pro Tools, DA-88s, Focusrite, Neve, Summit, Pultec, TC, Neumann, Steinway.



Atlanta Digital
audio

Atlanta Digital

500 Means St., Suite E
Atlanta, GA 30318
(404) 522-4777; Fax (404) 522-3723

Atlanta Digital is the Southeast's newest high-end mastering facility, featuring a fully expanded Sonic Solutions workstation including NoNOISE and CD printer. Out-board gear includes Focusrite ISA 215 EQ, Manley Variable-mu compressor, TC Electronic M5000/MD2 and Apogee converters. The room was specifically designed and professionally tuned for audiophile mastering. The system is capable of 24-bit 96kHz audio for the new DVD format. Recent clients include Arrested Development's Speech and Headliner, Vagabond, D.A.R.P., Doppler and Crawford.

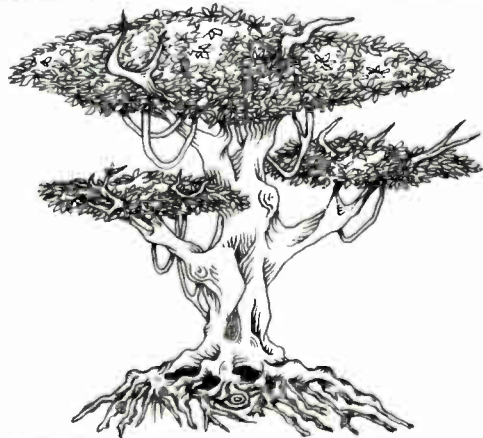


The Hook Studios

12623 Sherman Way, Suite B
North Hollywood, CA 91605
(818) 759-4665; Fax (818) 759-0268

"The best overdub facility in L.A."

With a focus on vocals and overdubs, The Hook is a facility dedicated to serving one client. Our goal is to provide a no-compromise microphone choice for each vocalist and instrumentalist. We feature a Neve 8068, a Studer A827, and 50 microphones including AKG C-12s, C-24s, Neumann U47s, U67s, M-249s, SM-2s, 582s; Schoeps C-221s, Telefunken Elam 250, 251. We are confident that we can meet your needs.



TREES

Tree Sound Studios

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STUDIO SHOWCASE



Harbor Sound Studios

180a Central Street
Saugus, MA 01906
(617) 231-0095; Fax (617) 231-0295

Harbor Sound Studios. Beautiful tracking facility designed and built by Acoustech, featuring custom Neve console (1073/1066), Studer A800 MkIII, Pultec, Teletronix, Genelec, vintage mics and the latest in new gear. Second room to feature Neve 8018 console and AMS Audiofile for mix and overdub. Located 10 minutes from Boston and 15 minutes to Cape Ann beaches. One minute from U.S. Route 1.



Troposphere Studios

One Naylor Place
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<http://www.garden.net/users/troposphere>
e-mail: tropospherestudios@garden.net

Conveniently located in northeast NJ, just 20 miles outside of NYC, Troposphere Studios offers its clients a huge, 7,000 sq.-ft., acoustically tuned facility designed for tracking, mixing and film or video lockup. We feature an SSL 4048 G Plus series console with lots of new and vintage outboard gear to satisfy every artist, manager and producer. Spacious iso booths offer comfort to the performer, and a 15,000 sq.-ft. warehouse can easily be adapted as a live room. In short, Troposphere is one of a kind. Call for a brochure and information.



Carmel Digital

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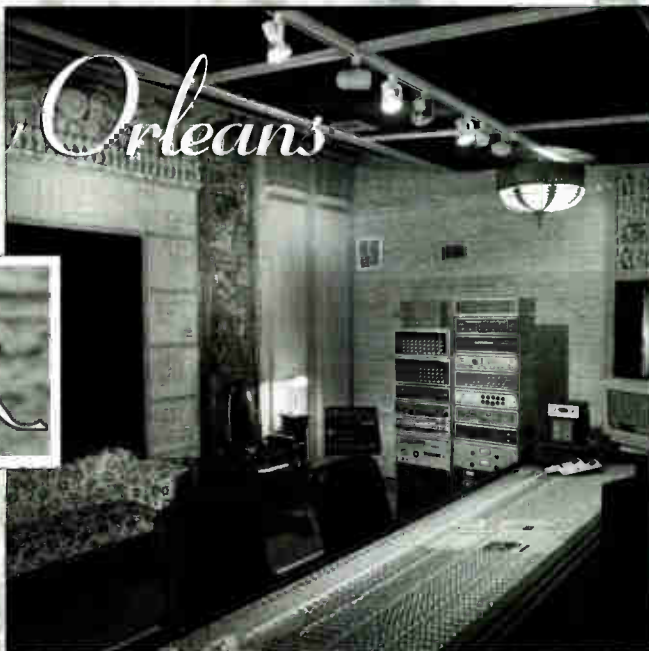
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TASCAM 102 mkII / 103 Stereo Mixdown Cassette Decks



Best values for musicians, studio operators and production houses, the 102 mkII and the 103 consistently produce only the highest quality tape recorded output.

- Their Feature:**
- 60dB signal-to-noise ratio and wide frequency response using any type of cassette tape
 - Dolby B/C noise reduction and Dolby HX Pro extends high frequency performance up to 6kHz and minimizes distortion
 - Bias-sensing electronics automatically chooses best recording settings for the type of tape you load—Normal, Metal or CrO2
 - Record/Mute autosaver automatically inserts 4 seconds of silence between spots or broadcast segments
 - Independent L/R stereo level and master record level controls
 - Tascam 103 Advanced Features:
 - 3-head system allows you to record on a tape and monitor it at the same time, without rewinding.
 - MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction

202 mkIII Dual Auto Reverse Cassette Deck



- Provides high-fidelity sound reproduction and a wide frequency response, as well as a host of features to help you easily dub, edit, record or playback onto/from one or two cassettes
- Normal speed and high-speed dubbing
 - 4-second autospacer
 - Dolby HX Pro sound extends high frequency performance and minimizes distortion on Normal, Metal and CrO2 tape
 - Create a professional-sounding composite tape from several sources. Functions like Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks you want
 - Twin two-head cassette decks in a durable rack-mount housing that can be used separately or in tandem during recording and playback for total flexibility

302 Double Auto Reverse Cassette Deck

- All the features of the 202 mkIII, plus more recording and playback flexibility. That's because the 302 is actually two independent cassette decks, each with their own set of interface connectors, transport control keys and noise reduction functions.
- Auto-reverse capability on both decks
 - Individual/simultaneous record capability—both decks
 - Independent RCA unbalanced in/out for each deck
 - Cascade and Control I/O let you link up to 10 additional machines for multiple dubbing or long playing record and playback applications.

112 mkII Stereo Cassette Deck



The classic "no frills" production workhorse, the 112 mk II is a 2-head, cost effective deck for musicians and production studios. Extremely rugged and reliable, the 112 mk II is ideal for production mastering and mixdown. It also features a parallel port for external control and an optional balanced connector kit means it is flexible enough to integrate into any production studio.

112R mkII Bi-Directional Stereo Cassette Deck

The 112R mk II is a sonically uncompromising, auto reversing and continuous play cassette deck. It offers the finest independent head auto-reverse design at this price level, plus it has extra dubbing and editing features for long program recording.

- All the features of the 112 mk II plus—**
- Three-head transport with separate high-performance record and playback heads. The heads combine with precision FG servo direct-drive capstan motors to provide the highest standards of reproduction quality and performance
 - Hysteresis Tension Servo Control (HTSC) virtually eliminates wow and flutter by maintaining consistent back tension on the tape all through the reel, combatting inconsistencies brought on by extreme temperatures and humidity
 - Auto Reverse mode plays or records in both directions before stopping, switching sides on the fly
 - Continuous Reverse mode allows you to loop the tape during playback up to 5 times, or record in both directions, without pausing to flip the tape and re-engage the record mechanism.

marantz

CDR620 Compact Disc Recorder

The CDR620 is a next-generation stand-alone write-once CD recorder. It offers a truly comprehensive set of features for a wide range of applications including recording studios, mastering facilities, post production, broadcast and more.

- Includes a sample rate converter, a DAT start I/O/CD track converter, auto-increment mode, an ISRC encoder, programmable digital fade-in/out and an index recording capability
- SCSI-2 interface for connection to popular hardware/software and virtually any PC for use as a CD-ROM recorder
- High oversampling 1-bit A/D (64x) and D/A (128x) converters
- Subcode sensing or adjustable level sensing for automatic track incrementing. Also supports manual track incrementing.
- Wired remote provides control and status of all CDR620 operations. Both index and ISRC code recording can be activated, as well as catalog number recording (EAN/UPC). The remote also supports copy prohibit on/off and emphasis on/off
- Ignores SCMS (Serial Copy Management System), permitting unlimited archiving
- Has a comprehensive array of analog and digital inputs/outputs, including multiple digital audio interfaces (AES/EBU and IEC-958-II) and balanced 4+/-10dBu selectable analog input and +4dBu balanced analog output
- Cascade feature provides simultaneous parallel operation of multiple machines, and a 9-pin parallel (GPI) interface facilitates external automation



PMD-101/201/221/222/430 Portable Professional Cassette Recorders

The world standard for field recording, the PMD line is also the value leader. They all feature RCA line input/outputs, 1/4-inch headphone jack, built-in speaker, pause control, audible cue and review, tape counter, full auto shut-off and low battery indicator.

General	PMD-101	PMD-201	PMD-221	PMD-222	PMD-430
Stereo/Mono Heads	2	2	3	3	3
Inputs/Outputs					
Mic Input	1/4-inch	Miniplug	Miniplug	Mini/XLR	1/4-inch
Condenser Mic	Built-In	Built-In	Built-In	Built-In	—
Remote Jack	—	Yes	Yes	Yes	—
Modular Tel. Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR/dBx NR	—	—	—	—	Yes
Mic Attenuation	—	0,-10dB, -20dB	0,-10dB, -20dB	0,-10dB, -20dB	0,-15dB, -30dB
Ambient Noise Cont.	—	Yes	Yes	Yes	—
MPX Filter	—	—	—	—	Yes
Manual Level Control	—	Yes	Yes	Yes	—
Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pinch Control	±20%	±20%	±20%	±20%	±6%
Bias Fine Adj.	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

Telex

ACC2000/4000 Cassette Duplicators

Designed for high performance and high production, Telex duplicators also offer easy maintenance and ease of use. The ACC2000 is a two-channel monaural duplicator, the ACC4000 is a four-channel stereo duplicator. Each produces 3 copies from a cassette master at 16X normal speed and with additional copy modules you can duplicate up to 27 copies of a C-60 original in under two minutes. And they copy both sides at once.

The XL Series feature "Extended Life" cassette heads for increased performance and wear characteristics. They also offer improvements in wow and flutter, frequency response, S/N ratio and bias.

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| <p>Easy Maintenance:</p> <ul style="list-style-type: none"> • Slanted work surface and "heads-up" cassette platform prevent oxide build up on the heads and makes cassette loading and unloading easier. • Three point tape guidance system eliminates skew problems and prevent unnecessary wear and tear on the tape head mechanism. • Audio and bias, along with head adjustments, are made easily from the top of the unit and a switch on the back engages the head and pinch roller for convenient cleaning. | <p>Fingertip Operation</p> <ul style="list-style-type: none"> • Individual rotary audio level controls • Peak reading LED indicators • Side A or B/S select button • Stop all tapes instantly, at any point during the copy or rewind cycle. • Short tape indicators alert you if a tape stops before the original does, identifying incomplete copies caused by jam or short |
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| <p>ACC2000 Mono Master Module:</p> <ul style="list-style-type: none"> • 1/2 track two-channel monaural duplicator produces 3 copies from a cassette master at 30 ips (16X normal speed) • Expands up to 27 positions by adding ACC2000 copy modules. <p>ACC2000 XL Mono Master Module:</p> <ul style="list-style-type: none"> • Same features as ACC2000, plus—Extended Life cassette heads. <p>ACC4000 Stereo Master Module:</p> <ul style="list-style-type: none"> • 1/4 track, four-channel stereo duplicator. Same features as ACC2000 Mono Master Module/ <p>ACC4000 XL Stereo Master Module:</p> <ul style="list-style-type: none"> • All features as ACC4000, plus—Extended Life cassette heads. Can be configured for chrome or ferric cassette duplication. | <p>ACC2000 Mono Copy Module:</p> <ul style="list-style-type: none"> • Each module has four copy positions with erase heads and controls for side select • LED displays indicate end-of-tape status for each pocket. <p>ACC2000 XL Mono Copy Module:</p> <ul style="list-style-type: none"> • Same features as ACC2000 Copy Module, plus—Extended Life cassette heads. Connects to ACC2000 XL Master Module <p>ACC4000 Stereo Copy Module:</p> <ul style="list-style-type: none"> • Same as ACC2000 Copy Module except 1/4 track four-channel <p>ACC4000 XL Stereo Copy Module:</p> <ul style="list-style-type: none"> • Same as the ACC4000 Copy Module, plus—Extended Life heads. Configurable for chrome or ferric cassette duplication. |
|---|---|

Copyette EH Series Duplicators

The Copyette series produce high quality, low cost cassettes in large quantities at nearly 16 times normal speed. Available in two versions, the Copyettes are capable of duplicating either one cassette or three at a time. Also available in both mono and stereo models.

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| <p>Stereo Copyette 1+2+1</p> <p>Weighing only 8 lbs. (3.6 kg), this unit has a durable, impact resistant housing and includes a removable power cord, carrying handle and protective cover. An optical, non-reflective end-of-tape sensing system that provides gentle tape handling.</p> | <p>Stereo Copyette 1+2+3</p> <p>This duplicator copies both sides of three cassettes at once, yet it's as small as the 1+2+1. It weighs only 12 pounds (5.4 kg) and includes a hard cover to protect the unit while not in use. It uses all DC Servo motors for the ultimate in reliability.</p> |
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Equitek Series Studio Condenser Mics

The "bench mark" for cost and performance, the Equitek series of microphones incorporate a unique servo design and exceptional flexibility to provide extraordinary ballistic capability and exceptional transient response.

E-300

A multi-patterned side address mic that combines vintage capsule design with advanced head-amp electronics, the E-300 has an unusually wide frequency response of 10 Hz to 20 kHz and an exceptional dynamic range of 137 dB. Also extremely low self noise of 11dB. Ideal for the most critical applications.



Shown with optional ZM-1 Shockmount

Unique powering of all mics is accomplished with a pair of rechargeable nicad 9-volt batteries in combination with 48-volt phantom power. This overcomes inherent current limiting associated with most phantom power supplies and can supply ten times the current.

E-200/E-100

The first member of the current Equitek family, the E-200 is also a dual capsule side address multi-pattern condenser mic, but with lower specifications than the E-300. The E-100 uses the same electronics as the E-200, but with only one of the same capsules in a supercardioid pattern.

- Frequency response of 10 Hz to 18 kHz.
- Dynamic range of 137 dB • Low self noise of 16 dB.

audio-technica. AT4033 Cardioid Capacitor Microphone

The AT4033 is a transformerless, studio microphone designed for use in the most demanding applications.

- Utilizes a gold-plated, "aged-diaphragm" condenser element with an internal baffle plate to increase signal-to-noise ratio, which coupled with low-noise transformerless electronics, makes the AT4033 ideal for critical digital recordings.

- Dynamic range is 123 dB without the built-in attenuator.
- Accepts up to 140 dB SPL without capsule or electronic-system distortion above 1% T.H.D. and a built-in switchable 10 dB (nominal) pad increases it to 150 dB.
- 2-micron-thick vapor-deposited gold diaphragm provides accurate reproduction of even the most subtle sounds.
- Permanently installed internal open-cell foam windscreen.
- Integral 80 Hz hi-pass filter for easy switching from a flat frequency response to a low-end roll-off.

AT4050/CM5 Multi-pattern Studio Capacitor Microphone

Supremely transparent and accurate, without sacrificing warmth and ambience, the AT4050 expands upon the AT4033.

- To set the standard for studio performance mics
- New large-diaphragm design utilizes two capacitor elements to provide consistent, superior performance in cardioid, omnidirectional and figure-eight cardioid polar pattern settings
- To achieve a warm, true-to-life sound in all polar pattern settings, Audio-Technica vapor-deposits pure gold onto specially-contoured large diaphragms which are aged through five different steps to ensure optimum characteristics over years of use. The transformerless circuitry results in exceptional transient response and clear output even under extremely high SPL conditions

SENNHEISER

HD 265

The HD-265 is a closed dynamic stereo HiFi/professional headphone offering a high level of background noise attenuation for domestic listening and professional monitoring applications. It is a suitable choice for monitoring applications in professional studios and to match the top of the range. HiFi systems, delivering a clear and tonally balanced sound with a minimum of distortion

HD 580

The HD 580 is a top class open dynamic stereo HiFi/professional headphone. The advanced design of the diaphragm avoids resonant frequencies. The HD 580 can be connected directly to HiFi systems of the highest quality, in particular DAT, DCC, and CD players. This headphone is an ideal choice for the professional recording engineer recording classical music.

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APHEX 106 Easyrider 4-Channel Auto Compressor

- Four individual channels in one rack space
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- Independent switches for fast or slow processing
- Dual in compression up to 20 dB
- Independent on/off switches
- -10 dB/+4 dB switch on each channel
- Voltage Controlled Attenuator (VCA) 1001 outperforms all other VCAs
- Linkable pairs for stereo applications

107 Tubessence Dual Channel Thermionic Mic Preamp

The 107 provides two discrete preamp channels, each with its own dedicated controls. A switchable 48 volt phantom power supply makes it compatible with all mics. The 107 delivers outstanding sonic performance, as well as a great degree of presence, detail, openness and imaging. It also provides extended high frequency response without any harshness and an improved bass response.

- Two independent channels with front panel XLR inputs
- Up to 64dB of gain available
- 20dB pad with red LED indicator
- Two LED input meter
- Full 48 volt Phantom power with red LED indicator
- Low cut filter with red LED indicator: 80Hz, 120dB/octave
- Polarity inverts on switch with LED indicator
- Individual channel remote mute capability
- Switchable +4dB/-10dB output: with 1/4" TRS phone jacks

TUBESSENCE: Combines the best attributes of both tube and solid state circuitry to provide performance unmatched by conventional designs. The solid state front end is transformerless and only expensive, great sounding capacitors are used in the signal path. The tube circuit imparts the sonic characteristics of tubes without the extremely high voltages, heat, fragility, and short life span of conventional tube circuitry.

109 Parametric EQ with Tubessence

The ApheX 109 is an extremely versatile and high performance single rack space parametric vacuum tube equalizer with unique features, flexibility and sound.

- True tube circuit (Tubessence) in the output stage for a "warm," "sweet" and "rich" sound.
- Dual (stereo) two band mono dual band equalizer configuration offers flexibility for general sweetening to critical problem solving situations.
- In Dual Mode each channel has +/- 10dB of input gain, a Low-Mid (20Hz-2kHz) band and a Mid-High (200Hz-20kHz) band.
- Each band has +/-5dB/-15dB boost or cut with center detent (flat), sweepable frequency adjustment, variable bandwidth, and switchable peak or shelving filter mode.
- Operates in the EQ (flat, calibrated center detent) mode yet still passes signal through the Tubessence vacuum tube stage. This is helpful for "warming up" digital signals.
- 1/5 octave to 2 octave bandwidth adjustment
- Switchable -10dBV/-4dBu operating level.

t.c.electronics Wizard M2000 Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and six different routing modes. There are 250 factory programs including reverb, pitch delay, delay, chorus, flange, phase, ambience, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit analog conversion, AES/EBU and S/PDIF digital inputs/outputs, "Wizard" help menus, 16-bit filtering tools, Tap and MIDI tempo modes and single parameter editing.

The array of enhanced pitch shift (up to 8 voices), chorus, and delay effects are characterized by their precision and versatility. Everything from the fine and subtle to the wide and spectacular is handled with equal superiority. The algorithms in the dynamics section are unique as stand-alone effects, but are particularly useful in combination with other effects. These might be de-esser/room, gated hall or compressed pitch. The possibilities are endless.

Tempo Tap functionality allows tempo to be adjusted in beats-per-minute and subdivided in any way you like—even in triplets. The tempo can also be read from MIDI.

Preset "Gliding" (morphing) function ensures seamless transition between effects. Very useful in mixing situations.

ALESIS 3630 Compressor

RMS/Peak Dual Channel Compressor Limiter with Gate

The most powerful compressor in its class, the 3630 is a dual-channel compressor that offers Ratio, Threshold, Attack and Decay controls to handle the toughest signals. It also offers a choice between RMS and Peak compression styles, plus Hard and Soft Knee dynamic curves for every application from subtle gain control to in-your-face punch. Ideal for use in applications from studio recording and mixing to live sound reinforcement and broadcast.

- Dual mono or linkable true stereo operation.
- User selectable Peak and RMS compression styles as well as hard knee/soft knee characteristics.
- Dual 12-segment LEDs display gain reduction and input/output levels.
- Each channel's built-in noise gate has an adjustable threshold and close rate to ensure clean, transparent performance.
- Switch input for ducking and de-essing.
- 1/4-inch inputs/outputs switchable for -10dB and +4dB.

M-EQ 230

Dual 1/3 Octave/Precision Equalizer

Used extensively in recording studios, since 1989, the M-EQ 230 provides 60 bands of 1/3 octave in a single rack space. Covering every band from 25 Hz to 20 kHz in 1/3 octave increments the M-EQ 230 is ideal for tuning the monitors in your project studio or even getting the most out of a home stereo setup.

- Two independent 30-band 1/3 octave graphic equalizers.
- Engineered with Alesis' Monolithic Integrated Surface Technology, gives you more features and better audio performance than many 2-space rack devices.
- Equipped with 1/4" and phono jacks
- Auto Power Muting function protects your components from power on/off transients.
- Input switch allows you to easily compare your original signal to the equalized sound.

NanoVerb

18-bit Digital Signal Processor

The NanoVerb breaks new ground in performance and sound by implementing an advanced, high-fidelity digital signal processor in an ultra-compact, easy-to-use and incredibly affordable package. If you're on a tight budget, you want to check out the NanoVerb; it has the features you need to get started.

- Offers 16 powerful preset effects, including hall, room, plate and non-linear reverbs, true stereo chorus, flange and delay.
- Also includes three multi-effects programs—chorus/room, chorus/delay/room and rotary speaker/room—allowing you to achieve a complete instrument or vocal effects setup from a single unit.
- Adjust knob provides complete control over delay time, reverb decay etc. by allowing you to tweak each program until it's just right for your music.
- Equipped with professional 18-bit A/D and D/A converters and a 20-bit internal processor that operates at three million iterations per second.
- Front-panel includes input level, effects mix, output level, program and adjust controls and dual-color signal input/clip LEDs. Rear panel interfaces include stereo 1/4-inch input and output jacks.
- Incredibly affordable, you can put two or three in your rack for dedicating to multiple sources. (Ultra compact, it requires only a 1/3 rack space.)

MicroVerb 4

Preset/Programmable 18-bit Signal Processor

An affordable solution for great sounding effects processing, the MicroVerb 4 goes far beyond the capabilities of any processor in its class. It offers the ability to edit and store your own customized programs, to utilize versatile multi-effects configurations and to take advantage of complete MIDI implementation.

- 18-bit A/D and A/D converters and 20-bit internal processor combine with the clean effects algorithms to offer a frequency response from 40 Hz to 20 kHz and a wide dynamic range. The result is ultra-clean, great-sounding effects for every application.
- 100 preset and 100 user-editable effects include many varieties of reverb, delay, chorus, flange and more.
- Advanced effects include rotating speaker simulation, auto-pan, tap tempo delay and dual-send sends (send one effect to one channel and a completely different effect to the other).
- Many of the effects are in true stereo and several offer up to three effects at once.
- Each program provides two local effects parameters that you can adjust in real time using two front-panel edit knobs or MIDI controls. For example, on a reverb program you can change decay and frequency content, and you can edit time and feedback of delays. Up to 100 edited programs can be saved to a dedicated user bank.
- Responds to MIDI program change and modulation, and it provides a special two-way TRS footswitch jack that offers both bypass and control functions.
- Easy-to-use "set-and-forget" interface offers a bright LED program number display. Just dial up a program number and start playing—that's all.
- Fits in a standard single rack space.

MidiVerb 4

Dual Channel Parallel Processor with Auto Level Sensing

The MidiVerb 4 extends Alesis' line of affordable professional multi-effects processing. It provides the sonic quality and programming power required for studio recording and live sound reinforcement while maintaining an incredible degree of affordability.

- Superb effects algorithms provide a wide variety of dense, natural-sounding reverbs, rich chorus and flange, versatile delay, rotating speaker simulation, pitch shift, panning and more.
- Auto Level Sensing feature automatically sets your input signal to the optimum level to take advantage of the MidiVerb 4's wide dynamic range.
- 18-bit oversampling digital converters add to the excellent audio fidelity, with a resolving 20 kHz frequency response and a dynamic range over 90dB.
- Provides complete MIDI implementation, so you can change programs and modulate parameters in real time with MIDI controllers (pedals, mod wheels, etc.)
- Each of the 128 preset and 128 user-editable programs use one of 32 configurations, or arrangements of effects. You can set up mono or stereo single effects, dual mono effects with separate mono-in and out for each channel, and multi-channel configurations that provide two or three effects at once.

QuadraVerb 2

Dual Channel Octal Processing Master Effects w/Digital I/O

Alesis' most powerful signal processor, the QuadraVerb 2 offers the amazing audio fidelity of a high-end dedicated vocal reverb while providing powerful multi-effects capabilities.

- 300 programs (100 preset and 200 user-editable).
- Octal Processing allows use of up to 8 effects simultaneously in any order. You can choose between over 50 different effects types for each block, including reverb, delay, chorus, flange, rotary speaker simulation, pitch shift, graphic and parametric EQ, overdrive and more.
- Special features like five seconds of sampling time, triggered panning and surround sound encoding are also built in.
- Selectable -10 dB and +4 dB levels, servo-balanced TRS inputs and outputs
- ADAT Digital Interface allows you to work entirely in the digital between the Q2 and an ADAT XT.

A R T

Tube MP Personal Preamp Processor

- Power/Peak LED for precision monitoring of power status and clip point.
- Input control has two ranges of gain: +26dB, +60dB and +6dB, +40dB.
- +20dB gain boosts input level for mic usage, or pad for accepting line levels.
- Phantom power supplies power to mics that require +48V phantom power.
- Phase reverse for worry-free multi-microphone placement.
- Output control for trimming back to unity gain.
- Genuine 12AX7 tube shapes and warms the sound of any transducer, from mics to piezo pickups.

BEHRINGER MDX 1200 Autocom

- Attack and release times, with Intelligent Program Detection, prevents common adjustment errors.
- Newly developed, powerful noise gate.
- Switchable soft knee/hard knee characteristics for varied sound pressure levels.
- Bright, illuminated LEDs show gain reduction.

MDX 2100 Composer

- Integrated auto/manual compressor, expander & peak limiter.
- Compresses "musically" in dynamic range without any audible "pumping" or "breathing".
- Attack & release times are controlled automatically or manually.
- Interactive Gain Control (IGC) combines a clipper and peak limiter for distortion-free limitation on signal peaks.
- Servo-balanced inputs and outputs are switchable between +4dB and -10dB.

White Instruments 4200A and 4400 L-C Series 1/3 Octave Active Equalizers

- The 4200A (active, cut only graphic EQ) and 4400 (active graphic EQ) provide 28 1/3 octave filters on I.S.O. centers from 31.5 Hz to 16kHz. Hand-tuned inductor/capacitor (L-C) resonant circuits provide the ultimate in performance and reliability.
- Better than 108 dB signal-to-noise ratio with no degradation even when filters are used.
- Continuously adjustable high and low-pass filters band-limit unwanted subsonic and ultrasonic noise.
- Three outputs and powered accessory crossover socket facilitate distribution and level control to three subsystems: 18-amp or tri-amp operation with optional 2-way and 3-way plug-in crossover networks.
- The 4200A has a -15 dB control range, the 4400 has a +10 control range.

4700 1/3 Octave R-C Active Digitally Controlled Equalizer

- Similar in specifications to the 4200A/4400 EQs, the difference is that all functions of the 4700 are digitally controlled.
- Ten non-volatile curve memories and ten preset memories using EPROM, so no need for battery backup.
- 10dB boost/cut in 0.5dB steps.
- Adjustable high and low pass filters and gain (8 steps)
- Digitally controlled by front panel or remote control.
- Password access assures security.
- The control circuits of multiple 4700s can be linked together to form a network of equalizers. The network can be controlled from the first 4700's front panel or optional RS-232C PA422 interfaces. Each network features 10 user-programmable pre-sets accessible via computer control, front panel selection or contact closure using the optional Remote Preset Select Interface.

DSP 5024 Digital Signal Processor

- 2 input, 4 output signal processor with 107 dB of dynamic range.
- Crossover can be configured as 2-way, 3-way, 4-way or dual 2-way.
- Adjustments can be performed in frequency 1Hz steps, slope (6, 12, 18, 24 dB/oct.), shape (Butterworth, Bessel, Linkwitz-Riley).
- Parametric filters include boost, cut, high pass, low pass, rising shelf and falling shelf, adjustable in 1 Hz steps, 1/10 dB steps and bandwidth from 1/70th octave to 4.8 octaves.
- Delay up to 680 ms on each output.
- Ten non-volatile memories and presets with password security.
- Remote preset select interface includes PA422.



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JBL

Control 5 Compact Control Monitor Loudspeaker



The Control 5 is a high performance, wide range control monitor for use as the primary sound source in a variety of applications. It's smooth, extended frequency response combines with wide dynamic capability to provide accurate performance that's ideal for recording studios, A/V control rooms & remote trucks.

- 6-1/2 inch (165mm) low frequency driver provides solid, powerful bass response to 50 Hz and a pure titanium 1-inch dome handles high frequency response to 20 kHz
- Both transducers are magnetically shielded, allowing use in close proximity to video monitors.
- Dividing network incorporates protection circuitry to prevent system damage and utilizes high quality components including bypass capacitors for outstanding transient accuracy.
- Molded of dense polypropylene foam, with a choice of black, gray or white finish.
- Pleasing enclosure allows it to easily fit into any environment.
- A host of mounting systems including ceiling, rack and tripod allow positioning in exactly the right spot for best performance.

4200 Series Studio Monitors

The 4200 Series are console-top monitor models designed specifically for use in the near field. Both the 6.5-inch (4206) and the 8-inch (4208) offer exceptional sonic performance, setting the standard for today's multi-purpose studio environment.

- Unique Multi-Radial sculptured baffle directs the axial output of the individual components for optimum summing at the most common listening distance (approx. 3 to 5 ft).
- The baffle also positions the transducers to achieve alignment of their acoustic centers so that low, mid and high frequency information reaches your ears at the same point in time, resulting in superb imaging and greatly reduce phase distortion.
- Curved surface of the ABS baffle serves to direct possible reflections of the shorter wavelengths away from the listening position, eliminating baffle diffraction distortion.
- Vertical alignment of the transducers across the baffle center produces natural mirror-imaging.
- Pure titanium diaphragm high frequency transducer provides smooth, extended response.
- Magnet assembly is shielded, allowing placement near magnetically sensitive equipment like CRT's, tape recorders, etc.
- Low frequency components also feature magnetic shielding making the 4200 Series monitors ideal for use in video post production facilities as well as music recording studios.

6208 Near Field Studio Monitor



An internally bi-amplified near field studio monitor, the 6208 provides excellent reference in a small, portable package. It combines optimized electronics with an 8", two-way speaker system on a Multi-Radial baffle that aligns acoustic centers of high and low frequency transducers. The transducers are magnetically shielded to allow safe placement near sensitive equipment such as tape recorders and video monitors.

- Electronically balanced input is compatible with both -10 dBV and +4 dBu nominal operating levels and input connection can be via XLR or 1/4" connectors.
- An electronic, 2.6 kHz crossover, designed specifically to complement the acoustic characteristics of the transducers, feeds dual amplifiers utilizing discrete circuitry. The amplifiers feature a low feedback design, with no slow rate limiting and extremely low distortion.
- The eight inch, low frequency transducer delivers a long, linear excursion resulting in a smooth extended bass output with low power compression. It is coupled to a one inch titanium diaphragm, high frequency transducer with patented "diamond pattern surround" exhibiting flat re-response, +/-2 db from crossover point to 20 kHz.
- The Multi-Radial(m) baffle aligns the acoustic centers of the high and low frequency transducers, ensuring that all frequencies arrive at the listening position at precisely the same time. This unique baffle design also greatly reduces diffraction and phase distortions. Dispersion characteristics of the 6208 reduce the effects of changing acoustic environments and achieve consistent, accurate imaging.

MACKIE

MICRO SERIES 1202-VLZ 12-Channel Ultra-Compact Mic/Line Mixer

Mackie's fanatical approach to pro sound engineering has resulted in the Micro Series 1202-VLZ, an affordable small mixer with studio specifications and rugged construction. It delivers no-compromise, non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio stations, broadcast studios and editing suites—where nothing must ever go wrong.

- Working S/N ratio of 90dB, distortion below 0.025% across the entire audio spectrum and +28 dB balanced line drivers.
- 4 mono channels with discrete, balanced balanced mic/line inputs and 4 stereo channels (12 inputs total).
- Line inputs and outputs work with any line level, from instrument level, to semi-pro -10dB, to professional +4dB.
- Switchable phantom-powered (48V) inputs for condenser mics.
- Every input channel has a gain control, pan pot, low EQ at 80 Hz, high EQ at 12.5 kHz and two aux sends with 20dB gain.
- Master section includes two stereo returns, headphone level control and metering.



MS1402-VLZ 14 x 2 Compact Mic/Line Mixer

Balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room feature. Nice long 60mm faders, six studio-quality mic preamps and extra ALT 3-4 stereo bus—less than 1.3 square feet of space.

- Studio grade mic preamps (chs. 1-6) with high headroom, low noise and phantom power. Also incorporate low cut filters to cut mic handling thumps, pops and wind noise. Lets you safely use low shelving EQ on vocals.
- Trim controls (ch. 1-6) with ultra wide range (+10 to -40dB) handle everything from hot digital multitrack feeds to whispering lead singers and older, low output keyboards.
- Pan control with constant loudness and high L/R attenuation so you can pan hard left or right without bleed-through.
- Two aux sends per channel with 15dB extra gain above unity.
- 60mm log-taper faders are accurate along their whole length of travel and employ a new long-wearing contact material for longer fader life & user resistance to dust, smoke etc.
- Control room/phone matrix adds incredible tap-monitoring, mixdown and live sound versatility.
- Mute switch routes channel output to extra ALT 3-4 stereo bus. Use for feeding multitrack recorder channels, creating a subgroup via controlroom/phones matrix, monitoring a signal before bringing it into the main mix or creating a "mix minus".
- Solid steel chassis instead of aluminum or plastic.



The new MS-1202, 1402 and 1604 all include VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for Mackie's acclaimed 8-Bus console series, VLZ effectively reduces thermal noise and minimizes crosstalk by raising current and decreasing resistance.

CR-1604 VLZ 16-Channel Mic/Line Mixer

Hands-down choice for major touring groups, studio session players, as well as broadcast and sound contracting. The CR-1604 VLZ features everything you would expect from a larger console, and then some! 24 usable line inputs with special headroom, ultra-low noise Unihplus circuitry, seven AUX sends, 3-band EQ, constant power pan controls, 10-segment LED output metering and discrete front end phantom-powered mic inputs.

- Lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range).
- Genuine studio-grade, phantom powered, balanced input mic preamps on channels 1-16. All CR-1604 VLZ discrete input mic preamp stages incorporate four conjugate-pair, large-emitter geometry transistors. So, whether recording nature sound effects or heavy metal, miking flutes or kick drums, you get the quietest, cleanest results possible.
- 3-band EQ with mid-frequency sweep and low cut switch.
- AFL/PFL solo and mute switches with overload and signal present indicators.
- Rear panel features include insert points and 1/4-inch XLR connectors on every channel, as well as RCA tape inputs/outputs.
- Rotary input/output "pod" allowing three different positions for set-up.



Digital Multi-Track Recorders

TASCAM DA-88

- ATF system ensures no tracking errors or loss of synchronization. All eight tracks of audio are perfectly synchronized. It also guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks - whether you have one deck or sixteen (up to 128 tracks!)
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48kHz. The frequency response is flat from 20Hz to 20kHz while the dynamic range exceeds 92dB.
- Execute seamless Punch-ins and Punch-outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks to generate special effects or compensate for poor timing.



SONY PCM-800

- Flawless sound quality, outstanding reliability and professional audio interfacing with AES/EBU digital I/O and XLR analog I/O connections.
- Combines audio functions such as precise auto punch in/out digital cross fade technology, external synchronization with SMPTE/EBU time code and selectable sampling frequencies of 44.1 and 48kHz.
- Shuttle dial for precise tape control, variable speed playback of 6% in 0.1% increments and a flat frequency response from 20Hz to 20kHz.
- Operate up to 16 PCM-800's in perfect sync with optional RCM-S1 sync cables for up to 128 channels of digital audio recording.
- Optional DABK-801 Sync Board provides SMPTE/EBU time code generation and chase sync. It locks to the incoming time code with subframe accurate offset—ideal for audio-follow-video applications. Also synchronizes to external video reference signal.
- Optional RM-D800 provides comprehensive remote control over all PCM-800 functions. The RM-D800 can control up to six units for up to 48 channels of digital audio.



ALESIS adat xt

8-Track Digital Audio Recorder

An incredibly affordable tool, the ADAT-XT sets the standard in modular digital multitrack recording. With new features and enhanced capabilities, the ADAT-XT operates up to four times faster than the original ADAT, offers an intelligent software-controlled tape transport and provides onboard digital editing and flexible auto-location.

- Onboard 10-point autolocate system provides quick access to multiple tape locations. Four specialized locate points make your recording sessions quicker and easier.
- Includes remote control with transport and locate functions, offers a footswitch jack for hands-free punch-in.
- Advanced transport software continuously monitors autolocate performance and the head continuously reads ADAT's built-in sample-accurate time code—even in fast wind modes.
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.
- Servo-balanced 56-pin ELCO connector operates at +4dB to interface with consoles with +4 dB bal/unbal inputs/outputs. Also unbalanced -10dB inputs/outputs (phono connectors).
- Has an electronic patch bay built-in so it can be used with stereo and 4-bus consoles.
- Make flawless copy/paste digital edits between machines or even within a single unit. Track Copy feature makes a digital clone of any track (or group of tracks) and copies it to any other track (or group) on the same recorder. This allows you to assemble composite tracks for digital editing.



ALESIS

Monitor One

Near Field Studio Reference Monitor

Designed by engineers with decades of experience, the award winning Monitor One provides the last critical link in the recording studio's signal chain, giving you an accurate reproduction of what is being recorded.

- Delivers excellent image and transient reproduction, powerful bass, and smooth, extended high frequency detail.
- Exclusive SuperPort speaker venting technology eliminates the "choking" effect of port turbulence for solid high-power bass transients and extended low frequency response.
- Ferrofluid cooled 1" silk-dome driver eliminates the harshness and ear fatigue associated with metal or plastic tweeters, making it easy to mix on for extended periods.
- Monitor One's powerful bass incorporates a proprietary 6.5" low frequency driver with a mineral-filled polypropylene cone and a 1.5" voice coil wound on a high-temperature Kapton former.
- They come in a mirror-image left/right pair covered with a non-slip rubber textured laminate for stable mounting.

Monitor Two

Mid Field Studio Reference Monitor

While today's popular music demands more bass at louder volumes than a small near field monitor can possibly provide—the Monitor Two delivers—at a price no higher than many of these smaller speakers.



- Utilizes a 10" three way speaker design with a unique asymmetrical crossover to maintain the same accurate tonal balance and imaging of the Monitor One—but with a much larger sound field.
- 10" low frequency driver incorporates Alesis' SuperPort speaker technology to provide powerful, extended bass.
- 5" mid frequency driver offers exceptional mid frequency detail.
- 1" silk dome high frequency driver delivers a broad but natural frequency response from 40Hz to 18kHz.
- Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy.

TANNOY

PBM Series II Reference Monitors

The PBM II Series is the industry standard for reference monitors. They feature advanced technologies such as variable thickness, injection molded cones with nitrite rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected inductors. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability and most important, real world accuracy.



PBM 5 II

- Custom 5" injection-molded bass driver with a nitrite rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- Woofers blend seamlessly with the 3/4" polyimide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise tonically-balanced monitoring.
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density media for minimal resonance and features an anti-diffraction radiused front baffle design.

PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" low frequency driver and 3/4" tweeter are fed by a completely redesigned hardwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radiused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

PBM 8 II

- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors and components available.
- Full cross-braced metal media structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities.

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TASCAM DA-P1 Portable DAT Recorder



- Rotary two head design and two direct drive motors for the best transport in its class.
- XLR-balanced mic/line inputs (with phantom power) accept signal levels from -60dB to +4dB.
- Analog line inputs & outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enable direct digital transfers.
- Uses next generation A/D & D/A converters for amazing quality.
- Supports 32/44.1/48kHz sample rates & SCMS-free recording.
- MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- TRS jack & level control to monitor sound with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter & 1 battery.



PDR1000/PDR1000TC Professional Portable DAT Recorders



- Direct drive transport with 4 heads for confidence monitoring.
- Balanced XLR mic and line analog inputs and two RCA analog outputs. Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU balanced XLR.
- Left/Right channel mix input attenuation selector (0dB/-30dB).
- 48V phantom power, built-in limiter & internal monitor speaker.
- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status, ID number, tape source status and machine status.
- Supplied Nickel Metal Hydride rechargeable battery powers the PDR1000 for two hours. The battery has no "memory effect" and is charged in two hours with the supplied AC Adapter/charger.
- PDR1000TC Additional Features:**
- In addition to all the features of the PDR1000 recorder, the PDR1000TC is equipped to record, generate and reference to time code in all existing international standards.
- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
- External synchronization to video, field sync and word sync.

Roland A-90EX Master Controller for the Next Century



The A-90EX is an 88-note, weighted master controller with the best keyboard action currently on the market—bar none. It offers incredibly realistic piano sounds, powerful controller capabilities and 'virtual' programmable buttons which can be configured to operate your software and other devices. The A-90EX combines the majestic sound of a concert grand, the expressive action of a fine acoustic keyboard and the comprehensive MIDI functions of a master controller—all in a portable stage unit.

Keyboard Controls

- Master volume slider lets you control the volume of your entire MIDI setup without changing the balance between connected devices.
- A Global Transpose switch transpose: all connected sound sources without changing the transpositional relationship between the individual devices.
- Sequencer Control Section lets you control song selection, tempo and other parameters easily and quickly.

Superb Sound

- The A-90EX's sound source is the result of an exhaustive and detailed sampling process. First, the best of the world's finest concert grands were sampled. Then each note was sampled under controlled conditions (mic position, stage and hall acoustics etc.) Only after extensive trial and error were the very best samples selected and incorporated.
- The A-90EX's sound source gives you access to a wide variety of sounds, including two types of stereo-sampled grand pianos, various styles of acoustic and electric pianos (including classic Rhodes sounds) and a generous selection of synthesizer textures.
- The versatility of these sounds is enhanced with 64-voice polyphony—indispensable for realistic piano sounds, giving you all the capacity you need for lush, sustained passages.
- For additional texture, there is also a generous selection of built-in effects, including several types of reverb and chorus.

Extensive Performance Configurations

- The A-90EX can store up to 64 Performances, which may consist of up to four of the A-90EX's preset Patches along with various user-configurable parameters such as zone, effects on/off and MIDI channel. Optional M-512E Memory Cards, stores an additional 64 Performances (per card).

88 Key Keyboard

- Proprietary 88-note hammer-action keyboard offers the natural resistance and rebound of an acoustic piano.
- Velocity-sensitive, the keyboard brings out every nuance of your dynamics, from pianissimo to forte. Selectable velocity curves let you choose the sensitivity that best suits a particular musical style or sound source.
- Keyboard also offers channel aftertouch-sensitivity—a powerful function for controlling external sound sources.
- The keyboard can be split into eight zones (four internal and four external, or you can assign all-eight zones to external devices). It also has 20 different controls and connectors for instant access to internal and external devices.

Built-In Sounds

- 128 patches from the Roland JD-990, JV-1080, Sound Expansion Series, JV-Series and SR-JV80 Series expansion boards. Customized patch names (can also be stored in the database. Optional Voice Expansion boards like the VE-GS1 offer a wide selection of GM and GS sounds and the VE-JV1 offers synth textures from Roland's JV-Series synthesizers.

SOUNDSCAPE DIGITAL TECHNOLOGY LTD.

SSHRD-1 Hard Disk Recorder/Editor



A professional Multitrack Digital Audio Workstation for the PC, the SSHRD1 combines the highest quality processing hardware with easy-to-use Windows-based software for the most complete and affordable solution for high quality digital audio recording and editing on the PC. The SSHRD1 has over 50 powerful editing tools and is expandable from 8 to 128 tracks, with up to 32 inputs and 64 outputs. Ideal for a wide range of applications ranging from recording music in project studios with an 8 track system, to multiple unit 32, 48 and 64 track systems used by major TV and film studios for audio post production/linked to video.

The SSHRD1 consists of two major components, a 19" rack unit which contains all the audio processing hardware and an intuitive and elegant software front end for Windows. The hardware, which connects to the PC via the included host interface card, can record 16 bit digital audio from the analog or digital inputs in stereo and play back up to 8 tracks simultaneously mixed through 2 or 4 analog or digital outputs.

All audio processing, disk handling and synchronization is carried out by the powerful DSP in the hardware, so literally any PC can be used—even a 386 with only 4MB of RAM. By putting all of the processing power into its own hardware instead of relegating it to your PC, the SSHRD1 also frees up your PC and allows it to act merely as a "front-end" view into the hardware workings. Multiple units can be backed together with sample accuracy, a feature which requires no additional software or hardware upgrades. SoundscapeDAWs have "rock solid" synchronization to analogue, digital or video tape recorders and even chase timecode when varisped is used.

- Using the virtual tracks, up to 64 audio takes can be recorded at the same timing position in an arrangement, allowing for instance, a sub mix of multiple backing vocal harmonies, dialogue or sound effects to be selected on any physical track later.
- Arrangements are created in the arrange window which display PARTS of a soundtrack and play the actual recorded audio TAKES on disk. A TAKE can be used in different ways by any number of PARTS which can play all or any section of the TAKE, e.g. a chorus vocal can be recorded just once, but used four times within an arrangement. These PARTS build up the soundtrack, and can be edited in a non-destructive way with waveform level "on the fly", even while chasing incoming time code.
- Move, Copy, Trim, Slip, Solo, Repeat, Delete, Cut, Glue edit functions.
- Solo and Multi-track audio scrubbing.
- 999 named markers (insert "on the fly")
- Realtime fade In/Out (8 selectable curves).
- Automated Punch In/Out.
- Volume contouring.
- Powerful noise gate (10 parameters with "floor" settings to remove silence or signals from a mix, ideal for ADR).
- Normalize process to 0dB.
- Stereo link tool for stereo editing.
- Varisped $\pm 10\%$.
- Midge edit using arrow keys.
- Supports all SMPTE formats, including 29.97 and 29.97 Drop frame.
- 9 customizable Tool Pages.
- AVI video file support with full synchronization (requires Video for Window V1.1).
- Optional EDL File support with full auto conform via RS422.
- Zoom in/out and history (8 levels) Windows V1.1.
- Volume and Pan controls (real-time, non-destructive, with full automation via MIDI).
- Assignable fader grouping.
- Merge (stereo digital mix-down).
- Reverse/Phase Invert/Compute tempo.
- Optional Time Module features Time stretch/Time compression Pitch shift and Sample rate conversion.
- Insert Left/Right Locators "on the fly".
- 8 physical output channels, selectable for each PART within a virtual track.
- Non-destructive sample-resolution editing with "glitch-less join".
- Total disc space is dynamically shared by all tracks.
- Cycle record mode with stacked TAKES and pre-roll (like analog multi-track tape recorders).
- Synchronization MIDI Song Positioner + MIDI clock or MIDI time code.
- Time axis display in SMPTE (hours, min, seconds and frames) or Measure (bars and beams), readout of time between locators.
- Arrangements are saved in separate arrange files on the host PC.



DM-800 Digital Audio Workstation

A compact, stand-alone multi-track disk recorder that provides an amazing array of features at an unbelievably low price. Whether for music production, post production or broadcast, the DM-800 lets you work easier and faster. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing, to rotation track-bouncing, to final mixdown. It fully supports SMPTE and MIDI time codes and also features a built-in Sample Rate Resolver to synchronously lock to any time code.

VS-880 Digital Studio Workstation

The VS-880 is an integrated digital recorder, mixer, editor and fx processor in one. A complete digital studio workstation, the VS-880 handles everything from data input and recording to mixing and mastering in one superbly styled, compact unit. It provides 64 recordable tracks, CD-quality digital audio and studio-quality multi-effects with the optional VS8F-1 Effect Expansion Board. Storage is accomplished via the internal 10mg Jaz disc. You can record 500 total track minutes or 60 minutes of recording time per track in Standard Mode on one 1GB Jaz disc.

Digital Recorder

- Eight discrete tracks, each with eight "layers" of virtual tracks. Record up to eight "takes" per track for a total of 64 recording tracks. At final mix-down, simply select the best take for each discrete track. You can even compile the best parts from various takes to create a perfect track.
- High-quality 18-bit A/D and D/A conversion, selectable sampling rates include 48, 44.1 or 32 kHz. The VS-880 is a non-linear, random access recorder/editor, so no memory is wasted on unused tracks or blank sections within recorded tracks.

Digital Editor

- Non-destructive recording and editing lets you easily return to any pre-recorded or pre-edited state. You can "Undo" up to 999 edits, even after conducting multiple recording/editing sessions. You can redo your song from any desired point, instead of going back to the beginning and starting all over.
- Copy, move and replace like using a sequencer or word processor. Cut and paste on one track or on multiple tracks (like track bouncing on an analog machine)—sound quality is always the same no matter how many editing steps are done.
- Compress or expand playback time. Specify time length from 75% to 125% of the original while the original playback pitch remains unaffected.
- Insert a "marker" anywhere in a song (up to 1000 markers) with instant access to any mark. Preview/Scrub function lets you execute a pin-point search for the first notes or the beginning of a phrase, while you monitor.
- All virtual track performance data can be stored and named as a Song (up to 200 Songs), complete with mixer, effects, mark and locate settings.

Studio Effects

- Optional VS8F-1 Effect Board provides two completely independent stereo multi-effects processors, allowing you to control every aspect of your recording without leaving the digital domain. Access during recording or mix-down.
- 200 patches (preset & user) based on 20 recording algorithms.
- Effects include everything from delay, reverb and chorus to distortion and speaker emulation. Some feature 3-D sound processing from the Roland Sound Space (RSS) system.
- Guitar effects like overdrive and distortion are included as well as a COSM-based guitar amp simulator.



Digital Mixer

- Digital mixer features 8 x 6 inputs, 8 recording busses, 1 stereo AUX send and 1 stereo master output. A coaxial digital input accepts a stereo (2-channel mono) digital signal.
- There are 4 analog audio inputs (1/4" phone and RCA jacks).
- You can record up to 6 channels including 4 analog and 1 digital stereo source simultaneously on 4 tracks. Using the digital coax out, you can archive your final mixes to DAT.
- For the simplest mixer/recorder configuration, the VS-880 gives you an 8-channel mixer with mixer channels and recorder tracks corresponding correctly. The Input Mix/Track Mix mode turns the VS-880 into a 14-channel mixer capable of mixing 6 input sources and 8 recorded tracks at one time.
- Sync sequence data from an external MIDI system, along with 8 recorded tracks, for simultaneous playback and mix-down right on the VS-880, no submixer required.
- Built-in parametric EQ, with all tonal contouring represented on the display for instant confirmation. In Input -> Track mode, EQ offers three bands—High (Shelving), Mid (Peaking), and Low (Shelving) and 8 channels. In Input Mix/Track Mix modes, a 2-band EQ is available.
- Every mixer parameter setting, including internal routing and EQ settings, can be captured as a "snapshot." Up to 8 snapshots can be stored and switching among them is as simple as touching a button. Fader movements can be recorded with an external MIDI sequencer for fully automated mix-downs.

Disk Features:

- Built-in 1G Jaz drive for storage: lets you take audio with you—just like tape. Built-in SCSI port offers additional storage capability with SyQuest, MD drives, DAT tape etc.
- MIDI connectors let you sync the VS-880 with a MIDI sequencer, either as a master or slave. Sync through MIDI Time Code or MIDI Machine Control.
- You can record mixer settings and fader movements into a MIDI sequencer. Playing the sequence back, in sync with the VS-880, affords fully automated mix-down capabilities. Has a MIDI Clock-dedicated track independent of the main tracks, so you can even sync to a non-MIDI/MMC compatible sequencer. Stack two VS-880s via MIDI and you'll get a digital recording system with 16 discrete tracks and as many as 128 total tracks.

Fostex D-25 Digital Master Recorder



Professional digital master recorder featuring the confidence monitoring, and insert editing using a 4-head transport. Sync functions for any pro application including the ability to chase sync to a master timecode. The D-25 will resolve to external references such as WORD/VIDEO/DAT frame signal.

- 16 MB RAM buffer • Instant Start & Edit • Scrub from tape x buffer • Jog/Shuttle from 1/2X to 16X • SMPTE/EBU TC generator/reader • On board chase/lock sync • RS-422 slot • Independent left/right recording • 4-head 4-motor transport.

D-30 Digital Master Recorder

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—FROM PAGE 16, 10110101

domain, and though it is highly suspect and unlikely that they deliver 24 bits of true recording resolution, even *that* may actually appear someday soon.

Have you noticed that the impossible seems to happen more and more often these days? We aren't actually breaking the laws of physics just yet, but we certainly are pushing hard up against them. You can't slip a smart

Capitalistically driven expansion of the known universe. What a life!

card between where we are now and the limits of the known digital recording universe, yet it is always within those last few thousandths of an inch that the magic takes place. And right after it does, high-temperature superconductivity or some other as yet to be named alchemy will simply move those laws a bit further out of the way.

That's what we as a techno-race do: develop to the very limits of the laws and then discover something new and wonderful that moves those very laws out of our way for a couple more decades. We then promptly begin to develop within the newly won territory, and the cycle repeats. Capitalistically driven expansion of the known universe. What a life!

Look at where we are now: Dirt-cheap removable media handling more data and more simultaneous tracks than *any* hard disk could dream of in its highest RPM rotary fantasies a mere five years ago. Twenty-bit conversion for Everyman. Three years ago, I figured we would have 20 real bits shortly after we evolved beyond corporeal life. Oh, well.

We also have 16-bit converters in ball point pens! My Christmas tree last year had four computers cross-fading 600 tiny lights into mesmerizing patterns and sequences. I really *needed* this. On the useful front, we now have artificial hands that actually allow the wearer to feel heat and cold, and 20 to 20k Hz stereo invisible internal inductive hearing aids that are literally *glued* onto the eardrum with a little oil

in a minute or so of outpatient procedure. These are some of our technical things.

There is one more technical thing that is just beginning to work as I write this. I have in the past made vague, evasive references to holographic crystalline memory concepts, quantum shift memory and other similar dreams. My references were non-specific by contractual edict—I couldn't say more. Well, some of these areas are beginning to yield, and when they do, our world is going to get much larger, much smaller and much faster.

Larger. Most of my friends have around two to four gigs at home, and if they are audio or graphics people, another ten to 20 gigs at work (I remember when a gig *was* work). This is all mechanical, spinning disk memory—faster and faster every year, but not fast enough. So we all have lots of RAM (Real, Applicable Memory). I have half a gig of that stuff in the little Mac I am writing on now. Half a gig is enough for a little audio editing, but nowhere near what it takes to achieve true RAMdom digital audio editing. As good as digital recording systems are getting now, they all must eventually shove your bits onto some mechanical media. This is getting pretty fast too, but not as fast as RAM.

We are rapidly approaching the limits of the era of disk-based recording systems. They are very good now, and prices have just become sane. Even I finally bought a commercial one. But we need gigabytes and even terabytes of high-speed, nonmechanical memory to reach the dream of true instant access to any bit at any time.

And this next push against the laws of physics will come from some form of *Star Trek* crystal lattice memory. The development I know about is on 100-gig crystals, later to be one terabyte. Size does count, and larger is better.

Smaller. All the trick memory crystals in the world won't do us much good if they are the size of subwoofers, so you will be glad to know that these coming 1-terabyte crystal marvels are targeted to eventually be a little over one cubic inch each! Size does count, and smaller is better.

Faster. Though these things are only marginally faster than today's super drives, that will change. It is planned that they will approach the speed of RAM. But that isn't the whole story. You will eventually be able to

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read and write to these things at the same time, something that we can only do now to extremely expensive multiport RAM used in very small quantities around DSP engines, video accelerators and other problem areas. An added bonus is that this crystal memory is truly "static." In other words, it does not need refresh cycles. This makes it easier to manage in a computer or digital audio recorder (same thing) and has the stunning

**The next push
against the laws
of physics will come
from some form
of Star Trek
crystal lattice memory.**

side benefit of automatically remembering everything it knows without the need for batteries—even when the system is turned off for a year or so, and even if it crashes. Nice. Not only speed, but safe speed. I wish I had that with the Harley.

So what does all this mean to you? Well, as the first crystal memory devices are slated to be drive emulators (they will be little boxes or cards that speak SCSI or IDE and look like a normal, albeit insanely fast, hard drive to your system), go ahead and buy the DAW of your dreams today, and simply plug in some of this crystal speed tomorrow.

How about backing up an entire album, in its native multitrack format onto a couple crystals that fit in the palm of your hand? And how about making that backup in one minute or so? How about an entire effects library on tap in memory for *instant* access?

And the next step? Self-repairing, growth-on-demand, living organic memory is in the works. Really. Wait until you get a virus in one of *these* systems... ■

SSC apparently has more memories than can fit in his brain, so some are leaking out. He wishes this technology were ready now so he could back up the really good stuff before it is all gone.

—FROM PAGE 23, CAREERS FROM HELL.

ancient) than I could ever hope to be. Quite understandably, on the day I arrived he decided his primary mission was to make my life impossible.

Luckily, after a couple of months I learned that the station was selling off its AM arm, which played big band music, and they needed a part-time production person. So I bowed out of my beleaguered chief-engineership and went with them. The new owners were building what appeared to be a state-of-the-art studio complex across town. Four gorgeous new Scully 14-inch tape decks were going into one room, with a brand-new broadcast board and a rack full of fancy equalizers, modulation monitors and multiband compressor/limiters.

I soon had a nice gig going. In addition to handling all the station's production—sign-ons, sign-offs, IDs, the DJs' personal jingles and the occasional commercial—I also helped wire the new studios. One DJ never set foot in the station, but sent his programs in on tape, and I took over the responsibility of putting them on the air, doing rip-and-read news and weather on the hour and fielding the phone calls from his devoted (and mostly elderly) listeners, in which I'd explain patiently that "Bill is out of town tonight at an important charity event, and he prerecorded his show, and that's why he can't talk to you." Once a week I engineered a remote from a restaurant with the world's largest salad bar—the DJ and I got to pig out after the show was over. Other times I filled in for jocks on their days off, sometimes playing their song lists and sometimes making my own. It was low-rent, it wasn't my first choice for the type of music I wanted to play, and our audience was small and shrinking by attrition, but it was fun.

But one day when I showed up for work the on-air studio was empty, the record library door was locked and some kind of drippy background music was coming out of the monitors. The station manager called me into his office and told me that the new owner had that morning fired all the on-air staff. I was now going to be the morning man—full-time, six hours/five days a week, with even a small raise in my hourly pay.

The only catch was, the format was no longer big band music. This very day the station was converting to "beautiful music," playing tapes from a

programming service somewhere in the Midwest (this was before satellite links were cheap enough for the job). That's what the Scully decks were for. And it was going to be automated. However, the money ran out before the station could get the entire automation package installed, and that was why I was being offered a job: They needed warm bodies to run the tape decks.

The tapes were supposedly scientifically programmed to "create positive and productive mood cycles," whatever that meant, but only, of course, when they were played in precisely the right order. Here was the routine: On the hour, I was to announce the time and do a station ID, and say one of five slogans, like "The sound of beautiful music." Then I was to start tape deck 1 and play one cut, exactly three minutes and forty seconds long. Then I was to play a cut from tape 2, then one from tape 3, then one from tape 4. At quarter past the hour: time, ID and another slogan. Play tape 2, tape 1, tape 4, tape 3. At half past the hour: time, ID and weather. Play tape 3, tape 2, tape 4, tape 1. At 45 past: time, ID and slogan. For the last quarter hour I could go hog wild and play the tapes in any order I darn well wanted.

I think if Jean-Paul Sartre had grown up in love with radio, this would have been his setting for *No Exit*, that wonderful vision of existential Purgatory. Picture it: Here I was, a musician, a reasonably decent production engineer, and a fledgling DJ, in a studio with a brand-new board and four lovely tape decks, which were loaded with putrid, hateful, unidentifiable elevator music. I wasn't allowed to choose any of the music, I couldn't say anything about the music—heck, I wasn't even allowed to know what the tunes were!—and I couldn't even say my own name, even if I'd wanted to. In fact, I was barely able to go to the bathroom: If I did, I had to make sure I was in and out in less than 3:40, lest I wasn't there to switch tape decks when a tune ended and (God forbid!) two selections from the same tape played in a row.

I did my first on-air shift, and when it was over I went back to see the station manager. He had gone to lunch, so I took the card with my name on it out of his Rolodex and tore it into little pieces, leaving the pieces on his desk. Then I went home. I never even went back to pick up my check. ■

Paul D. Lehrman hasn't had a full-time job since 1979.

—FROM PAGE 28, MIAMI RECORDING

as the business changes around us.”

New River has responded to changes in the music market, as well, by adding three Alesis ADATs in the past year, primarily to take advantage of the growing number of local home-based recording studios. Cayia says that the studio is getting more calls from local music acts, and many are looking to interface their own recording setups with those of larger studios in order to use their tracking rooms or consoles for mixing. New River has a vintage Neve 8081, a Trident Series 65 and a Korg Soundlink workstation. A Telos ISDN system and a Sonic Solutions system were added last year in preparation for yet another new market for the studio: mastering. “There are not a lot of mastering options in the Miami area,” says studio owner Virginia Cayia. “We wanted a system that would let us do a wide range of mastering clients, from project studios to major records, and to be able to send those mixes and masters around the country via the ISDN system. We’ve been getting some local and regional commercial work and some visiting film work from motion pictures that shoot here, so the post part is starting to move. Now we want to add a mastering service. The whole thing is diversify your revenue sources. You can’t just rely on music clients anymore. No one can.” Adds Paulina Cayia, “The days of four-month lockouts are over, so we diversify. But it’s different from Miami up here. You can pull your boat almost up to the studio and park it and come in and work, like Jimmy Buffet did.”

MUSIC REVAMPS

Despite the increasing emphasis on post, music clients are far from forgotten. Criteria, which last year added two new Studer 48-track digital tape decks, will cosmetically refurbish the entire five-room Neve/SSL/MCI console facility in 1997. Levy hints at some possible new technology platforms, but says that he doesn’t need to overly concern himself with post-production additions when music remains as strong as it does in Miami. “I added the ISDN lines when the local phone company ran a special offering to install them,” he says. “But I’m not going to go out and buy a patch system when I can rent a Dolby Fax whenever I need it. The same goes for workstations. It’s all well and good to look at post-production as a revenue source, but I feel strongly about keeping the music clients serviced first. And that includes keeping them comfortable with

the place, so we’re going to enhance the way it looks. But these are mostly music studios down here, even if they do add some post capabilities. Miami is still a music town. And it’s a good time here now that we have such a balance between work and the number of studios.”

Another music studio that is looking to improve itself along the same lines is Middle Ear, the Bee Gees’ one-room studio in Miami. Originally an all-MCI facility like many in Miami (where MCI was founded), the studio installed a Neve V3 Series console in 1985 and redesigned the acoustic space. That, however, was the last significant upgrade the facility had. The Bee Gees used Middle Ear exclusively for their own projects and productions they were involved in until 1993, when they decided to make the studio more widely available. The Bee Gees continue to use Middle Ear as a base for themselves and artists they produce, including a Kenny Rogers/Dolly Parton record, Diana Ross co-produced with Michael Jackson, and a Dionne Warwick album. However, studio manager Dick Ashby says that inquiries about the studio from potential outside clients have picked up in recent months and the studio may try to accommodate more rental time bookings. “The studio

is a bit dated in terms of equipment,” he says. “But it’s a good-sounding room and one that’s got a lot of history. We did just put in a new Dolby Fax system, in conjunction with some work that was being done between here and Record Plant in L.A. For the next round, I think we’ll start by buying a new 48-track digital machine, which is something that a lot of producers have been renting here lately. We’ll let our rental patterns of the last year indicate to us what equipment we might need and what directions to go in, as well as what the owners want for their own projects.”

Miami is getting pulled in several directions at once, a fate it shares with the rest of the industry in the U.S. at the moment. But its balance between market size and its studios, precarious as it might be in the long run, makes it quite comfortable in the short term. As Nancy Mraz, South Beach Studios’ manager puts it, “This is a seasonal business down here, and this year no one had a bad season, even in the off season. I mean, no one comes to Miami to record in July, but this year they did. So we’re going to have to keep looking at things like post and commercials and movies as the way of the future. But for right now, we’re doing just fine.” ■



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MIX

—FROM PAGE 38, MULTICHANNEL MIXING

are totally balanced in the mix room and listening area. "I basically do any panning and imaging in the stereo field, and I wait to put the whole mix into the surround—I won't even listen to the surround speakers while I'm working on the stereo mix," he explains. "It's important to get the image in the stereo field correct and then expand it little by little."

In general, Bell places most of the musical mix across the front sound field. "Some things I won't send back at all," he says. "Some things you leave discretely in the stereo image. Depending on the nature of the music and the project, it might be 25 to 30 percent less [in the surrounds] except for certain dynamic places, where we might max it out. Generally speaking, the back and surround is not roaring," he says, adding that he typically uses a percentage of the effects returns in the rear channel "to get the depth of a certain kind of environment, an architectural environment like a concert hall or something like that. The surround enhances the architectural perception of space."

A MUST TO AVOID

Asked about pitfalls, several interviewees pointed out that there is currently no agreed upon standard for multichannel surround speaker systems. "Many home theater setups use dipole speakers for the rear channels, often with limited frequency and dynamic range," says Bishop. "Most people mixing are doing so full-range all the way around and hoping for the best. There's likely to be some playback problems when there's some full-range music coming out of the surrounds and the speakers just aren't capable of it—and I don't want to compromise any of the surround channels to take the speakers into account." But Bishop is confident that the marketplace will come along and notes that home theater technology publications are already beginning to promote the use of full-range speakers all the way around, a departure from the THX standard of dipoles in the rear.

Brant Biles mentions one psychoacoustic phenomenon that may affect listeners' perceptions of multichannel material. "Don't expect to get things coming from the 90-degree position," he says, referring to the points directly between front and rear pairs and opposite the listener's ears. "If you have a signal panned from left front to left rear, there is a point midway at which

[the signal] subjectively drops 10 dB."

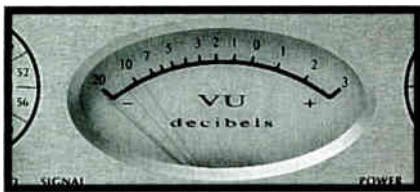
Tom Jung suspects that deficiencies in listeners' center channel monitors may cause problems. "My monitoring is all the same speakers, equal level and equal power," he says. "But that's not the way its going to be out there 90 percent of the time. In a home theater setup, even if you have full-range left and right speakers, the center speaker is going to sit on top of a rear projection TV or is going to be under it or...something less than ideal. Yet the center stage is very important. If I've gone out on a limb by putting lead vocal and very important instruments in the center channel, I might get bitten if the center speaker or amplifier is not as dynamic or not as full-range."

Alan Parsons suspects that multichannel music mixers may be tempted to mix as if for a quad demonstration release, "making lots of things happen in different channels at different times, rather like the immature period of stereo in the late '60s and early '70s. Everybody grew out of that, but there's a temptation to overdo the quad medium and not just let it settle in as another means of reproduction."

In the end, as Robert Margouleff points out, multichannel music mixing is primarily an artistic tool and will be most effective when used for that purpose. "Music in the '60s and '70s changed the fabric of our culture—that is really the purpose of art," he says. "Since then, computers and video games and TV have all tried to spell out literally what we're supposed to think when we're listening to music. To return to the subjectivity of really being able to listen and be involved centrally in the music is a major step forward artistically. I think we're seeing the beginning of the future."

The author would like to thank the following for help in preparation of this article: Dolby Surround applications engineer Jim Hilson; Mark Jeffrey of Access Music; Brad Miller of HDS; Henry Root of RSP/Rockiron; Rudi Simpson of Delos; and manager of technology marketing for Dolby Labs Dennis Staats. ■

Chris Michie's first experience with multichannel mixing was when he subbed at short notice for Pink Floyd's FOH mixer (the appropriately named P.A. Watts) during the London premiere of the Dark Side of the Moon stage show. He still flinches at the sound of circling cash registers.



—FROM PAGE 124, MIC PREAMPS

processor offering a mic preamp, LA Audio's Classic Compressor II with de-ess function and Classic EQ. The solid-state Classic Channel (\$1,399) has transformer-balanced inputs and outputs, mic or line input, phantom power and a variable highpass filter. The compressor section offers classic "LA sound" with variable threshold, ratio, attack and release controls; the 4-band EQ features shelving high and low filters with sweepable low- and high-mid filters. An optional 20-bit A/D module (\$599) is available for the Classic Channel.

The **Midas XL42** (distributed by Mark IV Pro Audio Group, Buchanan, Mich.) is a solid-state stereo mic preamp with 4-band EQ. Each channel offers mic or line input, pad, phase reverse, phantom power, sweepable highpass filter and switchable insert point. The 4-band EQ is fully parametric; high and low bands offer Bell or Shelf mode. The master stereo output allows each input channel to be panned across the stereo bus, and multiple XL42's can be daisy-chained for stereo operation. Ten-segment LED meters track output level on each channel. Input and output transformers are optional. The list price of the XL42 is \$1,700.

The HV-3B from **Millennia Media** (Placerville, Calif.) is a high-voltage solid-state mic preamplifier designed for critical recording applications. Derived from the popular HV-3, the HV-3B (\$1,895) will accept optional plug-in A/D converters. The Millennia Media HV-3C adds 20-bit UV22 converters to the HV-3B. The HV-3C (\$3,295) includes an Apogee 20-bit A/D converter using the popular UV-22™ encoding process, AES/EBU and S/PDIF outputs, word clock, Soft Limit™ clip protection and Apogee's patented C768 Ultra Low Jitter Clock. Options include ADAT or TDIF interfacing, 130V power for high-voltage B&K mics and a 20-bit digital input for stand-alone UV-22 processing.

The PreQ³ from **Night Technologies** (Provo, Utah) is a 2- or 4-channel mic preamp with NightPro's patented Vari-Air low-phase-shift high-frequency EQ. Controls include mic or line input, phantom power, 20dB pad, phase re-

verse and bass roll-off switches. Air Band EQ is implemented with one gain and one Air Band "elbow" frequency control per input. The 2-channel PreQ³ has a suggested retail price of \$1,595; the 4-channel version (PreQ³a) lists for \$2,595.

From **Precision Analog Systems** (West Hills, Calif.) comes the MPA 100 dual-channel mic preamp. The hand-built MPA 100 (\$2,195) uses a combination of bipolar, JFET and MOSFET devices for full Class A operation. Features include phantom power, phase reverse, mute and 20dB pad for each channel. Dual 10-segment LED meters track output level. The MPA 100 uses transformer-balanced input and direct-coupled output circuitry.

New from **Oram Professional Audio** (Kent, England) is the MWS mic preamp and four-band EQ. The MWS (or "Microphone Work Station," \$2,242.50) is a 2-channel unit offering mic and line inputs, phase invert, phantom power, sweepable highpass filter and preset lowpass filter. The MWS EQ section includes high- and low-frequency shelving filters with two selectable frequencies, sweepable semi-parametric low-mid and high-mid filters (preset bandwidth) and master EQ bypass. The MWS also offers dual bargraph-style LED output meters.

Rane Corporation (Mukilteo, Wash.) debuted the VP 12 Voice Processor in 1996. The VP 12 (\$599) offers mic or line inputs, variable low- and highpass filters, de-esser, noise gate, compressor and two-band EQ. Compressor/gate section has a 7-segment LED gain reduction meter; 6-segment meters show level from the VP 12's main and aux outputs. The EQ section is fully parametric, with master bypass. Input "sum" mode combines both line and mic inputs for simultaneous processing.

Also from **Studer** (Nashville) is the D19 MicAD (\$7,950), an 8-channel solid-state mic preamplifier with on-board 20-bit A/D. It can operate as a stand-alone unit, or up to four MSS-10s can be rack mounted together.

The MPX-4a2 from **Sytek Audio Systems** (Chicago, Ill.) is a 4-channel solid-state mic preamp in a single-rack-space package. The MPX-4a2 (\$1,280) uses a combination of discrete components and ICs to offer transformerless Class A amplification. Each channel offers mic input, balanced output and mute, phase and phantom power switches.

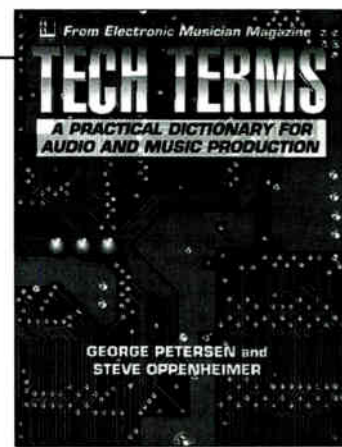
Distributed by Sascom (Oakville,

Ontario), **TL Audio's** Crimson Series offers two mic preamps that are essentially solid state versions of its Indigo Series tube products. See the Indigo section earlier in this article for pricing and details on the Crimson preamps.

The DCA-1 from **Uncle Albert's Amplifier Inc.**, (Indianapolis, Ind.) is a single-channel, all-discrete, Class A preamplifier featuring a transformerless input, phantom power, phase reverse and balanced output. Priced at \$599.95, the DCA-1 is housed in an aluminum chassis and has line inputs on the front and back panels. A 2-channel version is available at \$899.95.

Whirlwind (Rochester, N.Y.) debuts its MD-1 battery-powered mic preamp and headphone driver. The MD-1 (\$295) offers an input level control with 40dB range, transformer-coupled mic input, line input, switchable 18-volt phantom power, transformer-coupled output switchable to mic or line-level and headphone output level control. Designed for portable use, the dual 9-volt battery-powered MD-1 even includes a belt clip. ■

Loren Alldrin is a freelance producer and writer based in Nashville.



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—FROM PAGE 82, SHOCKWAVE

using the highpass/lowpass filtering of Waves' AudioTrack Xtra for SE 16.

Once EQ'd, the file should be Normalized (Effects menu). Next, the Shockwave for Audio Settings (Xtras menu) should be set to 16 Kbits/second and High Accuracy. Finally, the file is exported (File menu) with SWA File selected as the Export Type. There is no preview functionality for any of this process, so trial and error is the only way to tell if changing the filter settings or using other kinds of EQ or dynamics pretreatment yields audible improvement in the way a particular file sounds once it is data-compressed by Shockwave.

MAKING AND EMBEDDING MOVIES

With one or more .SWA files in hand, the next step is to make a page and movie to play them. Actually, the Shockwave Audio developer tools download includes two example shocked movies (Player.dcr and 1by1.dcr) and the source movies (Player.dir and 1by1.dir) from which they were "burned," as well as simple HTML pages from which the movies may be played. The Player movie (a nice, compact 7 KB) plays a single .SWA file from a simple but effective high-tech style interface (see Fig. 3), while the invisible 1by1 movie starts playing audio on a page as soon as the page is loaded.

Macromedia states that "even if you're a new user of Director, you can easily modify these template movies to refer to your audio file." This may be true as far as it goes, but if you want a player that can play more than one .SWA file from a given page, or even just looks different, you will either have to start digging into Director yourself or find someone who already knows it. Even so, the example movies provide a good starting point for seeing how the whole setup is supposed to work, and tags from the example pages may be lifted and inserted into any HTML page.

As mentioned above, the usual way to place movies in a page is by using the Embed tag. Fig. 4 shows the tag as it might be used in an example page designed to test the playback of an .SWA file from a local hard drive (as opposed to from the Internet). In this

example, the page, the movie and the .SWA file are all assumed to be in the same folder. To be sure the tag will not conflict with older browsers, it is placed inside of a Script tag (see the Troubleshooting section of the Director 5 Shockwave guide for a full explanation). The Embed tag itself is the parenthetical statement that starts with "<embed" in line 4 of the example.

As with many HTML tags, Embed takes parameters such as width and height, which define the area set aside in the page for the movie's stage. Embed also requires the SRC parameter, the value of which is the location of the movie ("player.dcr"). A number of optional and user-definable "external parameters" are also available. To ensure compatibility with Internet Explorer, be sure to use only those parameter names listed under the Additional Parameters subheading in the Object Tag section of the Integration with Browsers guide.

External parameters are used to pass information from the page to the movie. In Fig. 4, for instance, the swURL (universal resource locator) parameter tells the player that the sound file to play is "SND_FILE.SWA." This allows the same player movie to be used to play different sounds on different pages by defining swURL with a different file name. Similarly, the swText value "Testing local file: SND_FILE.SWA," which shows up in the player's "LCD," could say something completely different on another page without the movie itself having to be changed at all.

Since external parameters are user-definable, the same swText parameter might also be used in a different setting to feed a list of song titles or URLs to a player movie that is designed to allow the end-user to select a file to hear from a number of options (see Fig. 5). Be aware, however, that the maximum length allowed for parameter values is determined by the user's browser, not the Shockwave plug-in. Parameter values may be accessed from within a movie by calling the new Lingo function externalParamValue("x"), where x is the name of the parameter (i.e., "swText").

Other Lingo that is new for Shockwave Audio includes calls to specify a cast member's URL, to start, pause or stop audio playback, to set the amount of a file that should be preloaded before play, to start preloading, and to check on the state of a file: stopped, playing, done, etc. (States should be checked using the "on exitFrame" handler rather than in a repeat loop.) The calls are explained in the Shockwave

Audio guide under Controlling Streaming Audio with Lingo. As with regular Director movies, you can use Lingo to let the user change the volume; you cannot start the playback of a file from any point other than its beginning.

Shockwave-specific Lingo is not supported in Director itself, so "burning" a movie over and over to check it in a browser is an unavoidable part of the authoring process. The browser, of course, does not have Director's debugging features, and the error messages from the plug-in are cryptic and sometimes misleading. Because all this can get tedious, it is a good idea to create and test as much of the movie as possible within Director itself before starting to work with the Shockwave Lingo calls. (Variable values that will come from externalParamValue calls in the final movie, for instance, may be temporarily defined directly in a script.) To check playback over the network, the URL of an .SWA file on the Web (the swURL used in the downloaded player.html page, for instance) may be used instead of a filename from a local drive.

Once the page/movie/.SWA file combination works flawlessly in testing, it is ready to be uploaded (keeping the same relative directory structure) to a Web site, assuming that the site is set up for the required Shockwave MIME types (see Configuring Your Server in the Getting Started guide). If the page plays back audio from the Web, then the Shockwave minefield has been successfully negotiated. With a little experience under their belts, developers should find it fairly straightforward to modify their movies to make new players for different situations. According to Shockwave product manager Ben Dillon, Macromedia is working on making the process of preparing Shockwave audio less harrowing in the future, perhaps eventually integrating its Shockwave production tools and developer resources into a more coherent working environment.

In the meantime, the company has readied a new Shockwave tools download with a player movie (CDPlayer.dcr; 63 KB) that can play more than one .SWA file from a given page. The download is also supposed to include better explanations of how audio-oriented developers who are leery of getting involved with Director can still create and use Shockwave audio on their web pages. ■

Phil De Lancie is a multimedia designer and mastering engineer for Fantasy Records in Berkeley, California.

—FROM PAGE 203, SESSIONS & STUDIO NEWS

Studio B at NRG Recording (North Hollywood) with producer/engineer Steve Churchyard and assistant Steve Mixdorf...Canyon Studios in Laguna Beach had former Stray Cat Lee Rocker in recording and mixing songs for a self-produced new release with engineer Mike Hatcher...

NORTHEAST

At New York City's The Magic Shop, engineer extraordinaire Mario Caldato Jr.

G-Love's self-produced new Okeh/Epic release with engineer Guy Lutze and assistants Chris DeBenidetto and David Szumowski...Pinetop Perkins sang the blues for his next Deluge Records release at Trod Nossel Recording (Wallford, CT)...The Essence All Stars (featuring Joe Lovano and Branford Marsalis, among other luminaries) recorded *Jackie's Blues Bag—A Tribute to Jackie McLean*, at Clinton Recording in New York with producer/arranger Milan Simich. The Hip Bop Essence

nales in Spicewood, TX, Dale Watson recorded with producer Bruce Bromberg and engineer James Tuttle for Hightone Records...

STUDIO NEWS

The former Prince's former cohort Tony Mosley (aka Big Bro) added Bag End's Studio B monitor system (consisting of a matched pair of MM-8 near-fields, a D10E-S subwoofer system and an ELF-M Tree integrator) to his studio...Atlanta's Tree Sound Studios is moving to a 15,000-square-foot facility in nearby Peachtree, GA. Currently under construction is Studio A, designed by George Augspurger, which will feature an SSL 4000 G+ with Ultimotion and Total Recall. ■



Jazz great Jimmy Scott (R) recorded a cover of "Love Will Keep Us Together" for a multi-artist *nouveau lounge* album due out on Hollywood Records. Scott tracked in Studio A at Clinton Recording in New York City with help from Red Hot Chili Peppers bassist Flea (in paisley), guitarist Marc Ribot and (Rear) keyboardist John Medeski. Dave Schiffman engineered, assisted by Robert Friedrich.

tracked Japanese hepsters Cibo Matto for an upcoming Warner Bros. release. Bandmember Yuka Honda produced...Roy Ayers produced his upcoming release on RCA Records at The Cutting Room Studios (New York City) with engineer John P. Hopkins handling the final mixes...PeaceTree worked on a new project with producer Harold Chambers at ESP Studios in Akron, OH. The band is signed to Cleveland label Fish Head Records...Nenad Bach mixed tracks for a self-produced CD with engineer John Holbrook and assistant Rick Pohronezny at BearTracks Recording in Suffern, NY...At Sound Techniques in Boston Lunar Plexus recorded and mixed a self-produced tune with co-producer/engineer Ted Paduck...The Make Believe Ballroom in West Shokan, NY, had Jack DeJohnette and Don Alias in working on a new project recorded by Tom Mark...Andy Powell and Roger Filgate of Wishbone Ash recorded their VH-1 unplugged set on MCA at North Shore Studios in North Salem, NY...Philadelphia's Sonic Recording had G-Love and guest Dr. John in tracking for

release is due out this month...Coward worked on an Elektra release at New York City's Sear Sound with producer Jerry Finn and engineer Sean O'Dwyer...

NORTHWEST

Harvey Mandel mixed a self-produced Electric Snake Productions release at San Francisco's Different Fur Recording with engineer Steve Savage and assistant Adam Munoz...At Studio D Recording in Sausalito, CA, the Katherine Chase Band recorded their Marquee Music debut with producer Jeffrey Wood, engineer Joel Jaffe and assistant Mike Cresswell...

NORTH CENTRAL

Flytetime in Minneapolis recently completed work on projects for Perspective/A&M artists Smooth and EMI artist Jon Secada...

SOUTHWEST

Recent sessions at Arlyn Studios (Austin, TX) included Marcia Ball recording for Rounder Records with producers Derek O'Brien and Mark Kazanoff and engineer Stuart Sullivan. At sister studio Peder-

—FROM PAGE 208, NY METRO REPORT

good office staff and a friendly environment are worth more than a rack of Neve or a stack of Pultecs. One of the biggest problems manufacturers are facing is pricing of these new technologies. Studio owners simply don't have the margins to afford them."

On the other hand, says Right Track owner Simon Andrews (who in 1996 installed a 96-input Neve Capricorn on the heels of a 96-input SSL 9000J a year earlier and who had a new 96-input Neve VX installed in January), the influx of high-end consoles to New York could simply be a function of the city's time to cycle. "It could be that it's simply time for it to happen in New York right now," he says, "just as it may have been time for Los Angeles a year or so ago and London before that. It's the nature of the high-end studio in locations like that to cycle on a regular basis."

However, Andrews adds, what is definitely changing is the fact that it's more expensive than ever to stay in that bracket, and that each successive cycle gets pricier. "It's more expensive than ever for high-end studios to stay high-end," he says. "You've got a lot of new, expensive technology out there and that's what the high-end studios need to stay where they are or move up. Rates are consistent"—a euphemism that many owners use when referring to the fact that rates don't keep pace with costs—"and that's a problem. But if you want to stay in the game, you do it." Welcome to New York. Welcome to the studio business. ■

Dan Daley is Mix's East Coast editor. E-mail stuff to him at danurwriter@aol.com, or fax to 615/646-0102.

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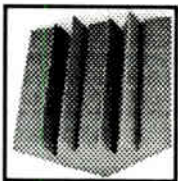
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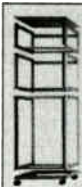
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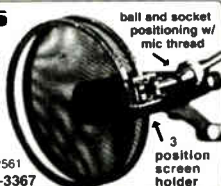
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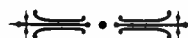
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FEEDBACK

ST.CROIX SLAM #35,560,182

I hope that by now Stephen St.Croix is being crushed by an avalanche of mail from offended PC/Windows users prompted by yet another of his pro-Macintosh, anti-PC and Windows tirades ("The Fast Lane" January '97 *Mix*).

While I'm sure Mr. St.Croix has a lot more knowledge of operating systems and hardware than the typical Mac fanatic, he insists on perpetuating the myth of the Macintosh as the "perfect" computer with the same kind of unjustifiable hyperbole that technically unsophisticated Mac users have been trying to put over as "proof" for years. I find particularly hyperbolic his claims about Macs being markedly faster. If he can do three times the amount of work, he's either (1) not doing anything sophisticated on his Mac or (2) comparing it to a Win 95 PC with a ridiculously small amount of memory.

And as for graphics, let's not forget that the main reason there are some cool PCI bus graphics adapters for Macs is that the board-makers found it easy to adapt the graphics accelerator chips that they originally produced to work with Windows to the Mac. And didn't St.Croix admit in his column not too many months ago that those same graphics chips were doing a better job of pumping pixels to the screen in PCs than in Macs?

But my purpose is not just to refute St.Croix's claims or to bad-mouth the Mac the same way that he's trashed "Wintel," but to move things toward a balanced viewpoint. The Mac has its bad points as well as good, as does "Wintel." Your personal choice comes down to a lot of factors—sometimes things other than technical superiority. It could be software availability, or it could be you'd rather stick with the problems you know about rather than buying into new ones.

One of the things Mac fanatics accuse "Wintel" of is "stealing the concept," while forgetting that the "concept" originated at Xerox back in the '70s. The point is that very few things spring out of the ground fully formed; most worthwhile things have been built upon what has gone before. Each side in this battle

can learn from the other. But, if we are going to be able to reap the benefits of any kind of cross-pollination, we all have to keep an open mind.

*Arthur Stoppe
Moorestown, N.J.*

ST.CROIX SLAM #35,560,183

I like "rants" as much as the next man. They're great when they're entertaining (Dennis Miller) and they're very distasteful when they're venomous to the point of being untruthful. I found two glaring errors in the Stephen St.Croix rant titled "It Coulda Happened!" (*Mix*, January '97).

This article was largely satirical—a brassy plea for sanity to reign over bad technology choices. Unfortunately, to discuss the brand of one electronic toy over another is to provoke an argument over whose system is better.

I will not disagree with St.Croix's assessment that Beta was better technology than VHS—most of the people I knew were well aware of it before buying VHS machines. But his comment that this decision was based upon advertising was in error. During the early VCR market days, I remember watching the prices, and retailers were carrying Betas at prices 30% to 50% higher than VHS. An article I read several years ago spoke about the "beating" Sony took on the Beta VCR system. According to this source, Sony lost this technology war for refusing to license the technology to other manufacturers until the VHS manufacturers had flooded the market and become the dominant product. The VHS prices were cheaper, in part, because the number of competitive machines made the market price more competitive. JVC licensed the VHS technology to anyone who made VHS machines. Sony didn't license Beta for the first two or three years and lost the market.

It's true, too, that most buyers didn't have the means to compare the technological differences between the systems and that, if a minimum level of performance was achieved, subtler technology differences didn't matter. One such issue was tape length. If VHS could carry the complete *Star Wars* title, who cared if

Beta could hold more time? As for sound quality, how many buyers could tell the difference on the monophonic speaker of their 19-inch-screen TV?

As for St.Croix's harangue about Mac vs. PC/Windows, again I can agree with his technology argument. I am a four-station, Windows user/owner, and I am aware that Mac products—particularly in the music and sound business—have led the way in innovation and ease. The Intel/MS alliance will perpetuate hierarchy-over-hierarchy of compounded operating systems for a long time to come, causing Mac emulation softwares (Windows et al) to mimic a better system at a real cost to CPU use.

However, at the core of this buying choice is also the price/license issue. When I chose PC over Apple ten years ago, it was based on a 50% price difference. Again, this pricing was predicated on IBM abandoning the PC product and licensing the technology to every manufacturer who came knocking at their door, while Apple held tight to their product and licensed to no one. The result, again, was to see competitors pulling prices down, while Apple, with no competitors, held their product sales at a much higher margin. As PC sales outdid Apple products, so did the number of peripheral hardware and PC software manufacturers outnumber the Apple system developers. The result was and is a greater number of PC products flooding the market, keeping prices competitive, and enticing new buyers to choose the industry leader over the better technology.

Kurt Misar, owner, Musicworks

THEN AGAIN...

I would like to thank Stephen St.Croix for the wonderful rant about Beta and VHS and Macintosh in the January *Mix*. All I can say is you and me should rule!!!


*Ray Benson,
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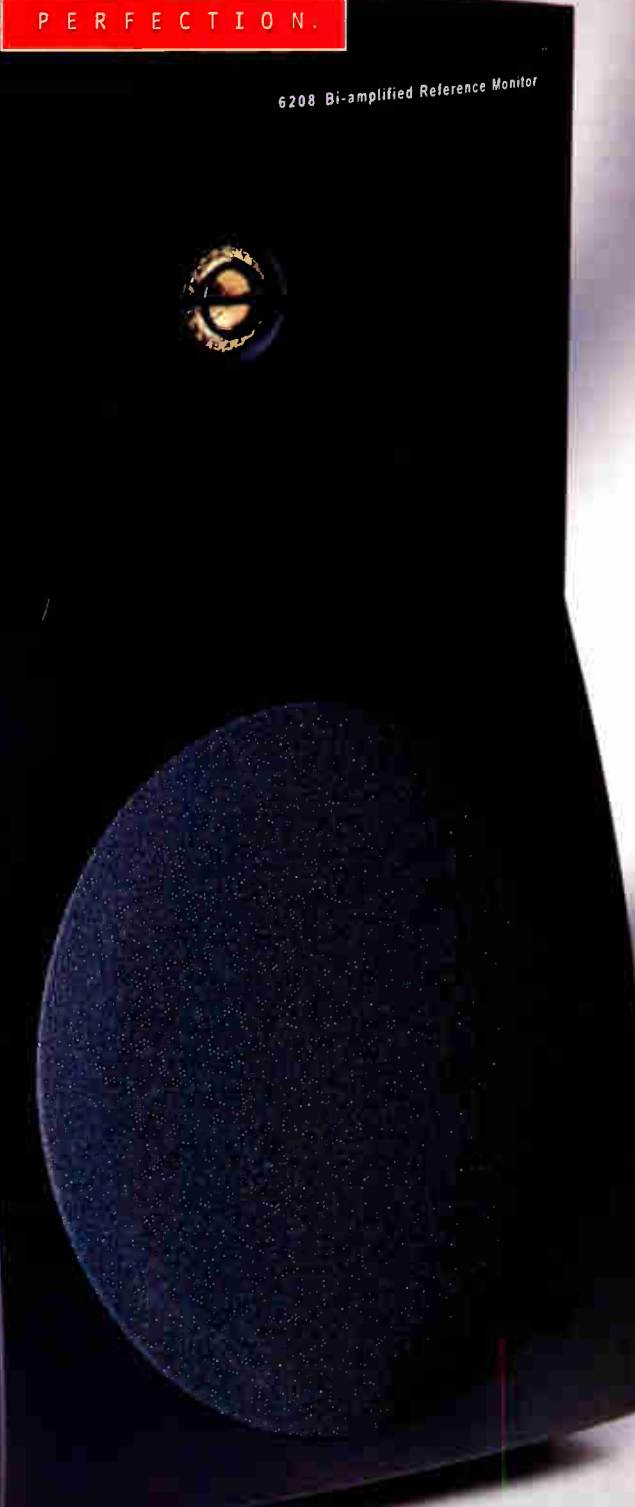
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