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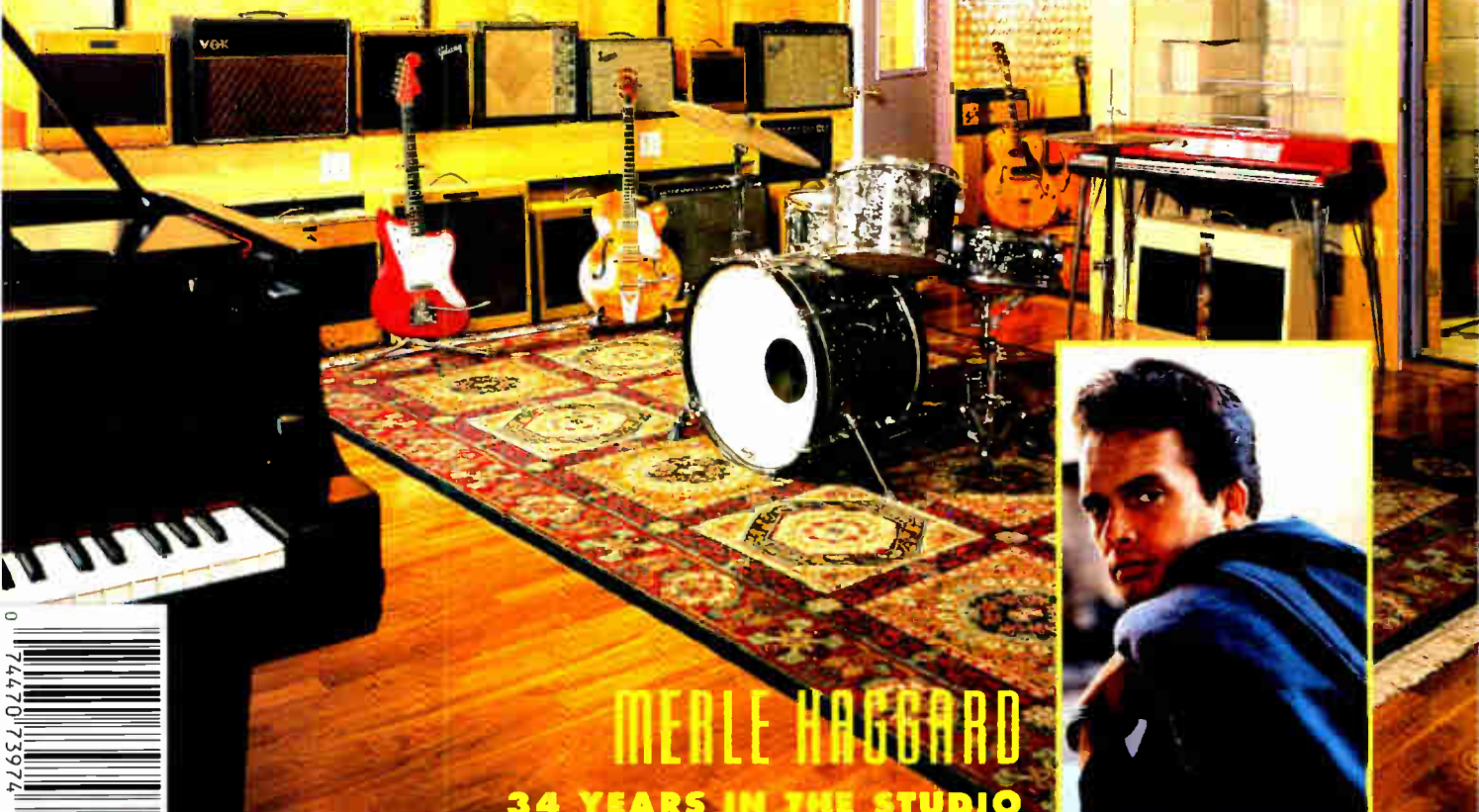
PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

FACILITY DESIGN & ACOUSTICS

- *Class of 1996*
- *Summer Venues*
- *Acoustical Materials*

Multimedia SURROUND

Product Hits FROM NSCA



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“Amazing Technology”

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Editor,
MIX Magazine*

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adat xt

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*Loren Alldrin,
Reviewer,
Pro Audio Review Magazine*

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*Paul J. Stampler,
Reviewer,
Recording Magazine*

“The bottom line, as Casey Stengel used to say: ‘Amazing, amazing, amazing.’ That is, amazing technology, amazing functionality, and amazing price.”

*Howard Massey,
Technology Editor,
Musician Magazine*



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For more information on the ADAT-XT, see your Authorized Alesis Dealer or call 310-841-2272.
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ALESIS

For some people, only one console is good enough.



Dolly Parton with producer Steve Buckingham (right) and engineer Gary Paczosa (left) pictured at Sound Stage, Nashville.

"We cut the tracks for Dolly's new album on the SL 9000 J Series at Sound Stage. We were so impressed with the way the tracks sounded that we are going back to mix on it. What I liked most was the warmth that we got back off the tape through the SL 9000. We found this console to be a superb complement to the digital recording process. The SL 9000 uses state-of-the-art technology to create that wonderful sound associated with classic consoles."

Steve Buckingham, Producer.

"The SL 9000 J Series console has more than exceeded my expectations. From the bottom to the top we were very impressed with this console. It is extremely clear, quiet and punchy. The need for any outboard processing was virtually eliminated. Sonically it is superb."

Gary Paczosa, Engineer.



SL 9000

Solid State Logic

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Graphic Display	yes	no	yes	no
A/D	18 bit 128X	16 bit	20 bit 64X	16 bit
D/A	20 bit 8X	16 bit	20 bit 64X	16 bit
Sampling Freq.	44.1, 48kHz*	n/a	32, 44.1, 48kHz	n/a
Freq Response	20-20kHz	2-18kHz	10-20kHz	2-16kHz
Digital I/O	AES/EBU, S-PDIF (optional plug-in)	none	AES/EBU, S-PDIF	none
THD @ 1kHz	<0.003%	<0.0032%	0.003%	<0.0032%
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Two Pros And Their Tannoys...

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

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• 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.



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• *Hootie and the Blowfish*
• *Tracy Chapman*
• *John Mellencamp*
• *Better Than Ezra*
"I have never been so close to final results in my life. These are the most accurate, balanced speakers I've heard yet."

photo courtesy of Kingsway studios, LA

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

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PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

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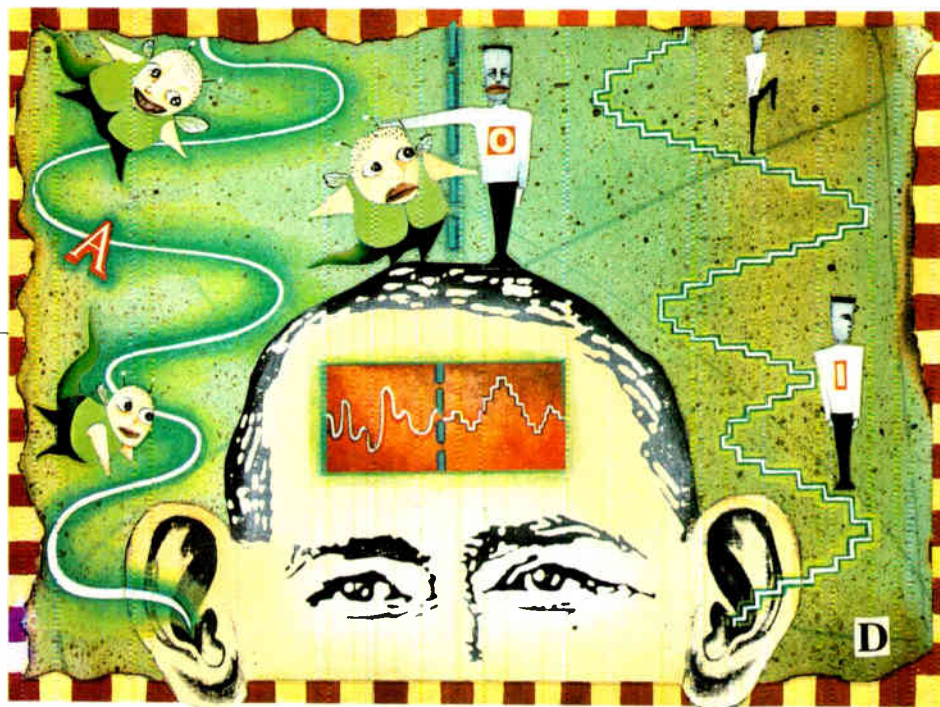
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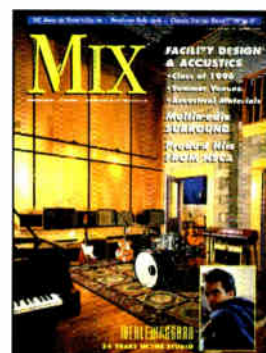
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<http://www.mixmag.com>

Cover: Rear Window Recording in Brookline, Mass., opened in March of this year. Designed by Rosati Acoustics, the studio offers an 8,500-cubic-foot main room and two iso booths, one with a variable-distance microphone pulley system. Major equipment includes a Trident 80-B automated console, a Sony APR-24, Genelec monitors and an extensive vintage mic collection.
Photo: Joe Greene



in the real



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FROM THE EDITOR

THESE ARE A FEW OF MY FAVORITE SITES...

The Internet has been called everything from the most important development since movable type (thanks, Mr. Gutenberg!) to a morass of shameless hoopla. The reality is somewhere in the middle, and if you dig around, there's some useful stuff out there. Here are some sites (all have <http://www.prefixes>) you may want to bookmark.

You may have noticed the bright red "Bookmark This!" pages announcing the *Mix* Web site. Well, it's here. The magic word mixmag.com will transport you to our electronic edition. And just as we've done to the magazine since *Mix* started out 19 years ago as a small newsprint publication, we'll be expanding our cyber-zine in the future, adding more features, such as online classifieds, back issues listings, facility databases, reprints of popular articles and more. Visit the site and drop some e-mail telling us what kind of features you'd like to see.

In audio, there's no better place to begin Internetting than aes.org. This site has plenty of technical resources and Audio Engineering Society-related info. AES also provides audio links to dozens of audio companies, organizations and newsgroups, such as everybody's favorite, rec.audio.pro. Its ProAudio.FAQ answers common problems that confront engineers today. Download it.

Other industry organization sites worth perusing include NAB (nab.org), NAMM (namm.com), SMPTE (smpte.org) and SPARS (spars.com). Wondering who wrote that song? Searching song titles/authors/publishers is easy at bmi.com or ascap.com.

Need upcoming tour schedules? Enter performancemag.com for *Performance* magazine's database of touring artists, with all the venues and dates you require. Speaking of bands, links to thousands of band Web sites are available at wmbr.mit.edu/bandlist or american.recordings.com. And harmony-central.com has tons of musician-oriented links and files—everything from onstage one-liners to downloadable copyright forms, PA, SR, etc., in TIFF format (bmi.com has forms in PDF format).

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Cybermentally yours,



George Petersen



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by David Schwartz and Penny Riker Jacob

“music
hit me
early on,...



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when I was five I was stretching rubber bands across brooms and making sounds. My father was my first real inspiration. I watched him create wonderful music on piano and came to understand that you could just compose your own songs.

That composing is just another form of improv. And vice versa. It could be used as a way to reach into your soul to get the music out. I give myself some goals... it's important to define where I am trying to go. For me, writing is my alter ego. I'll sit here with Logic Audio at the center of this very sophisticated system,

work for a week or two, get one or two songs down, and then the really good stuff starts to pour out. It's very intuitive. It follows my stream of consciousness."

Lee Ritenour

Lee Ritenour - Los Angeles 199

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CURRENT

MARTINSOUND EXPANDS, OPENS EUROPE HQ

Strengthening its presence in the international audio market, Martinsound Inc., developer and manufacturer of the Flying Faders automation system for Neve consoles, announced the opening of its European headquarters near Cambridge, UK. Martinsound International will serve as international sales and marketing operations headquarters, and will be the European manufacturing and service facility.

The announcement marked the latest growth move for Martinsound Inc., and followed two recent acquisitions. Earlier this year, Martinsound acquired console manufacturer Neotek Corp. Craig Connally, CEO of Neotek, was named vice president of the Neotek division and will continue to oversee operations at Neotek's Chicago headquarters. The new name for the company is Neotek, a division of Martinsound Inc. Also joining the Martinsound group was Anatech, the Cambridge, UK, console design firm. Anatech was founded in 1995, by a group of former Neve employees.

In a related development, Martinsound reached a distribution agreement with Audiomation, in which Martinsound will be exclusive distributor of the Audiomation system. In addition to offering the system for retrofit on a variety of consoles, Martinsound will feature Audiomation on all consoles in the Neotek division and on the new Anatech recording console.

DIGIDESIGN ANNOUNCES ALLIANCE WITH DOLBY, MACKIE

Digidesign recently announced strategic alliances with Dolby laboratories and Mackie Designs. Digidesign announced that in a developmental agreement with Dolby, it will support the new Dolby Drive™, Dolby's digital dubber; and that Dolby will soon release a Dolby Surround™ TDM Plug-In for Pro Tools. Digidesign also announced a joint development strategy with Mackie Designs. Initial plans call for the development of a new, low-cost hardware control surface for Pro Tools, as well as other DAE (Digi-

design Audio Engine)-based products. New products are scheduled to be released later this year.

PHILIPS FORMS DEVELOPMENT PARTNERSHIPS

Philips Key Modules' M&D Business Unit recently announced that it has agreed to be a key supplier of DVD technology to Professional Audio AG of Switzerland, a Harman Pro company and a division of Studer Professional Audio. Studer will in turn integrate this technology into turnkey solutions for the developing DVD post-production market. According to the agreement, Studer will sell, distribute and support a number of Philips audio and video DVD post-production products. The agreement also calls for joint support for the continuing standardization process as well as joint participation in exhibitions and presentations.

In other Philips news, the compa-

ny's Semiconductors' TriMedia Product Group announced a partnership with sound library developer InVision Interactive Inc., in which Philips will integrate InVision's CyberSound PC music synthesis technology in the forthcoming TriMedia TM-1 programmable multimedia digital signal processor. Also, the CyberSound code libraries will be available to TriMedia customers to assist audio development for their multimedia applications.

TIMELINE, MOTIONWORKS FORM ALLIANCE

According to a new alliance between synchronizer manufacturer TimeLine and synchronizer interface manufacturer Motionworks, the Motionworker machine control system will now include TimeLine's Lynx-2 synchronizer as a key component. TimeLine considers the agreement a logical step, even though it manufactures a similar unit. Director of European operations, Chris Hollebhone says, "We are happy to acknowledge that Motionworker is the market leader for this type of system integration. Our main interest is in selling the modules, and Motionworks needs a module that is properly supported and still being developed to interface to the new machines on the market. The Lynx-2 is really the only choice."

CD-Rs BOOST GROWTH IN WRITABLE MEDIA

The International Recording Media Association (ITA) reported a 34% increase in shipments of writable optical disk media in 1995. The dominant growth factor was a 360% jump in CD-R unit shipments, with a 156% increase in dollar volume, according to the ITA's statistical program. In contrast, unit shipments of MO (magneto-optical) disks rose 14%, with a dollar volume decline of 6%; shipments of WORM (write once, read many) disks climbed 48%, while dollar volume rose 14%. Industry figures were derived by combining sales figures of ITA member companies with estimated sales figures of non-members.

—CONTINUED ON PAGE 16

DEADLINE EXTENDED FOR TEC SCHOLARSHIPS

The Mix Foundation for Excellence in Audio has extended the deadline for submitting applications for the TEC Awards Scholarship Grant to Friday, August 30, 1996.

Administered by the Mix Foundation, the TEC Awards Scholarship Grant was created in 1995 to award funds to deserving individuals pursuing careers in audio and currently enrolled in an audio program. Last year, William Carpenter of San Francisco State University and Alexandra Loubeau of the University of Miami became the first two recipients of this new grant program.

If you are interested in receiving an application, send or fax your name, address and phone number to MFEA, 6400 Hollis Street, Suite 12, Emeryville, CA 94608; fax 510/939-4022. No phone calls please.



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Now, after over twenty years of pleasing the most finely tuned ears in the business, dbx has done it again with the new 1066. The dbx 1066 will, of course, be the standard against which all compressor/limiter/gates are judged. State of the technology VCA's, meticulous component selection, and scrupulous testing procedures are just a few reasons the new dbx 1066 is the latest in a long line of pedigreed signal processors.

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3-segment OverEasy® indicator lets you know when that classic dbx compression starts happenin'.

Fully adjustable attack and release controls offer maximum flexibility. or (see #7)

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Vary the Ratio to select anywhere from gentle downward expansion to gating.

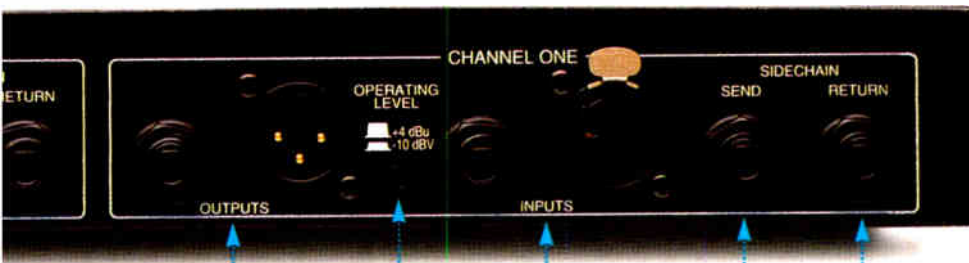
Detented controls and soft-touch knobs assure precision adjustments.

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Servo-balanced outputs drive up to +22dBu

Convert semi-pro -10dBV signals to the dbx 1066's professional +4dBu internal level.

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Separate sidechain send and return jacks —no special "insert Y-cables" required.

INDUSTRY NOTES

David Froker was promoted to GM of **Digidesign** (Palo Alto, CA), a division of Avid Technology Inc... Sony Electronics' Production Systems and Professional Audio Group in Montvale, NJ, brought onboard **Michael Tapes** as marketing manager, professional audio products... Canoga Park, CA-based **AKG Acoustics** appointed Tracy Cranton as marketing manager, professional sound; **Thomas J. Stotler** as market development manager, music retailing; and **David Rahn** as market development manager of recording/broadcast/touring sound... **Dennis Bohn**, vice president of research and development at **Rane Corp.** in Mukilteo, WA, was awarded an AES Fellowship for his contributions to equalizer and crossover theory and design... **Steven M. Meyers** was appointed to the newly created position of sales manager for the central region of **Quantegy Inc.**, based in Mountain View, CA... **Apogee Electronics** (Santa Monica, CA) named **Erika Lopez** as media products manager and **Lynn Welsh** as sales engineer... **Gayle Watts** joined **Symetrix Inc.** in Lynnwood, WA, as project manager. In other Symetrix news, the firm honored **JAMM Distributing** with an Outstanding Sales Achievement award for more than a decade of service... The Harman Music Group (Sandy, UT) announced the appointment of **Sandy Morgan** to the newly created position of customer satisfaction specialist for DOD and DigiTech... The Palm Springs, CA-based **Women in Music Business Association (WMBA)** recruited **Sandy Serge**, CEO of Serge Entertainment Group, to coordinate its Atlanta chapter... **David Zinman**, music director of the Baltimore Symphony and the Tonhalle Orchestra, accepted the position of music director of the **Aspen Music Festival and School** in Aspen, CO... **D.A.S. Audio S.A.** of Valencia, Spain, opened U.S. subsidiary offices in Van Nuys, CA, and Austin, TX. For information, call

818/786-0904... The UK's **Association of Professional Recording Services** announced that its president, **George Martin** has been awarded a knighthood by Buckingham Palace for his services to the recording industry... **Bag End Loudspeaker Systems** in Barrington, IL, appointed **Acoustisearch** of Huntingdale, Victoria as its exclusive distributor in Australia and New Zealand... Irvine, CA-based **Renkus-Heinz** named **Taub Sales** as its representative of the year; **Sound Marketing** has the year's most improved territory. Awards were presented at the NSCA show in St. Louis... **Rank Video Services America** (Los Angeles) promoted **Mary Ann Fialkowski** to the position of executive vice president of finance and planning, and **Americo Silva** to the post of vice president, purchasing and quality assurance... **Graham-Patten Systems** in Grass Valley, CA, appointed the **Waterfront Group** as its newest sales representative to handle sales of D/ESAM Series digital edit suite audio mixers for northern California, northern Nevada and Hawaii... **W/ho Did THaT MUSIC** moved to new offices and studios in West Los Angeles. The address is 2048 Armacost Ave., Los Angeles, CA 90025. Phone 310/442-1440; fax 310/442-1448... **Apogee Sound Inc.** in Petaluma, CA, named **Mainline Marketing** as its rep of the year... **Prosound Equipment**, the audio products sales division of Provideo Equipment A/S, was appointed to sell Belfast-based **Audio Processing Technology's WorldNet** digital audio codes and peripherals in Scandinavia... **Mobile Fidelity Sound Lab's** Web site (www.nofi.com/) was recently given a three-star designation by Magellan, the world-wide internet directory publisher... **ARX Systems** in Melbourne, Australia, announced the opening of a representative office in Brazil to service the South and Central American market. Call (55) 71-358-4902 for information. ■

—FROM PAGE 12, CURRENT

WEB ANNOUNCEMENTS

Apogee Electronics has a Web site at www.apogeedigital.com/. Here, find downloadable files including manuals and product installation information.

Audio Visual America is now online, at www.avamerica.com. The home page lists product information, news and employment opportunities.

Visit Innertube Audio's Web site, at www.gr8music.com/innertubeaudio.html. Featured information includes information for the U87 retrofit kit.

The Masque Sound home page, at www.masque-sound.com, provides technical support, mailing list information and "specials of the month."

Pacific Microsonics recently debuted a Web site, at www.HDCD.com. This site will be updated monthly with the latest HDCD development information.

Thorburn Associates is posting acoustic theory articles from its quarterly newsletter on its site. Visit www.TA-Inc.com for more information.

EVENTS CALENDAR

The PLASA Light and Sound Show happens next month, at Earl's Court in London. The show will take place on September 8-11, and will feature hundreds of light and sound products. For registration information, call (+44) 171-370-8179.

OMF (Open Media Framework) Developers Desk hosts the 5th annual OMF Developers' conference, on September 9-12 in San Diego, Calif. The convention will include group discussions, OMF demonstrations and an end-user vendor training session. Call 800/949-OMFI for details.

Atlanta hosts the 20th anniversary of Jack the Rapper's Music Convention this month. The JTR Music Expo '96 takes place August 22-25, at the Georgia International Convention Center in College Park, Ga. Convention highlights include a signed and unsigned artist's showcase, seminars, exhibitors from various areas of the music industry and entertainment events. For more information, call 404/724-2022.

CORRECTIONS

The June "Industry Notes" column incorrectly referred to Richard Elen as vice president of marketing at Apogee Acoustics. Elen's company is Apogee Electronics. In addition, the June article on Bruce Springsteen's home studio misidentifies Scott Hasson's company. The correct name is West Coast Video Services. ■



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If you've bought one or more ADAT[®]s or DA-88s, you've made a smart investment in the digital future. But there's so much more that can be done with the digital medium. **The Roland DM-800 disk-based Digital Audio Workstation** can exponentially increase the power of an ADAT-based recording system. Or, if you're just getting started, you can skip tape and plunge right into the DM-800. Either way, you'll get creative freedom far beyond the reach of tape-based digital.

ADATs have opened the door to high-quality 8-track digital recording. **The DM-800 opens the doors of your creativity.** Using Roland's DIF-800 interface, you can digitally transfer any of your ADAT tracks to the DM-800 for some serious editing power. Fix the pitch of notes or cut out a breath in a vocal track. **All edits are completely non-destructive**, so you can experiment without worry.

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Imagine making 10 digital copies of your song and then trying out different arrangements: extra choruses, different endings, alternate vocal takes with different lyrics. Then prepare for mastering using the dynamic level and EQ automation. The built-in video output lets you keep track of different song versions on a large screen.

You'll get all this creative freedom, plus the DM-800's **incredible sound quality:** wide imaging, warmth and punchiness, and a well-defined bottom end. And you'll be ready to do film and video projects, too. Just bring the portable DM-800 and DIF-800 to the video house and use an RS-422 to control your audio for layback or assembly.

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World Radio History

8 1 1 R I A S I E S E R V I C E W A R D F O R M O R E I N F O

SOMETHING IS MISSING HEAR

WHAT IT IS AIN'T EXACTLY CLEAR

Well. We all got here. We all made it through the painful and complex transition from analog to digital. More or less. Actually, more or less is the topic of today's column, but more on that later, less you think I move too fast.

Now, don't panic; this is not going to be another 2,000 words on why digital bites and how I really miss that old sweet sound of Mom's analog voice calling me. (She still calls, but it's not for dinner anymore; now it's just to check in from 3,000 miles away, and it's that old new 8-bit Telcom Special Digital Mom-voice.) And to think that she once told me that if you can't say anything that sounds nice, don't say anything at all. No, I am not going to tell you how digital fa-

tigues your inner ear, bends your karma or sounds harsh and brittle. Been there, done that. Nor will I again expound on those persistent lies about how many bits Joe's House of Converters' A/Ds really give you (that's over—if you have the bucks, dB Technologies can deliver 21 real bits).

Nah, nothing so crass, so blatant, so obvious. In fact, I will concede that the overall state of technology is now generally acceptable for most 16-year-old headbangers, as long as they listen at speeds above 80 miles per hour with the top down on a winding canyon road. After all, what's a byte or two among bends?

No, today I think that I shall

delve directly into the depths of the *real* question; assuming we have storage, error correction, A/D and D/A conversion, jitter and all that other techno-noise worked out; why do analog and digital recordings *sound* different? Wait! Trust me. I am not talking about all the stuff you think. I am *not* talking about analog tape compression, digital's ruler-straight frequency response or analog's noise. These factors are way too obvious for sophisticated readers such as yourselves.

Today I will discuss what I call The Vulcan Mind Meld. Here we go. Digital, with all the new advances, *still* sounds different from analog. You can buy a CD and instantly tell DDD from ADD, and from AAD, and, of course, from the

BY STEPHEN ST. CROIX

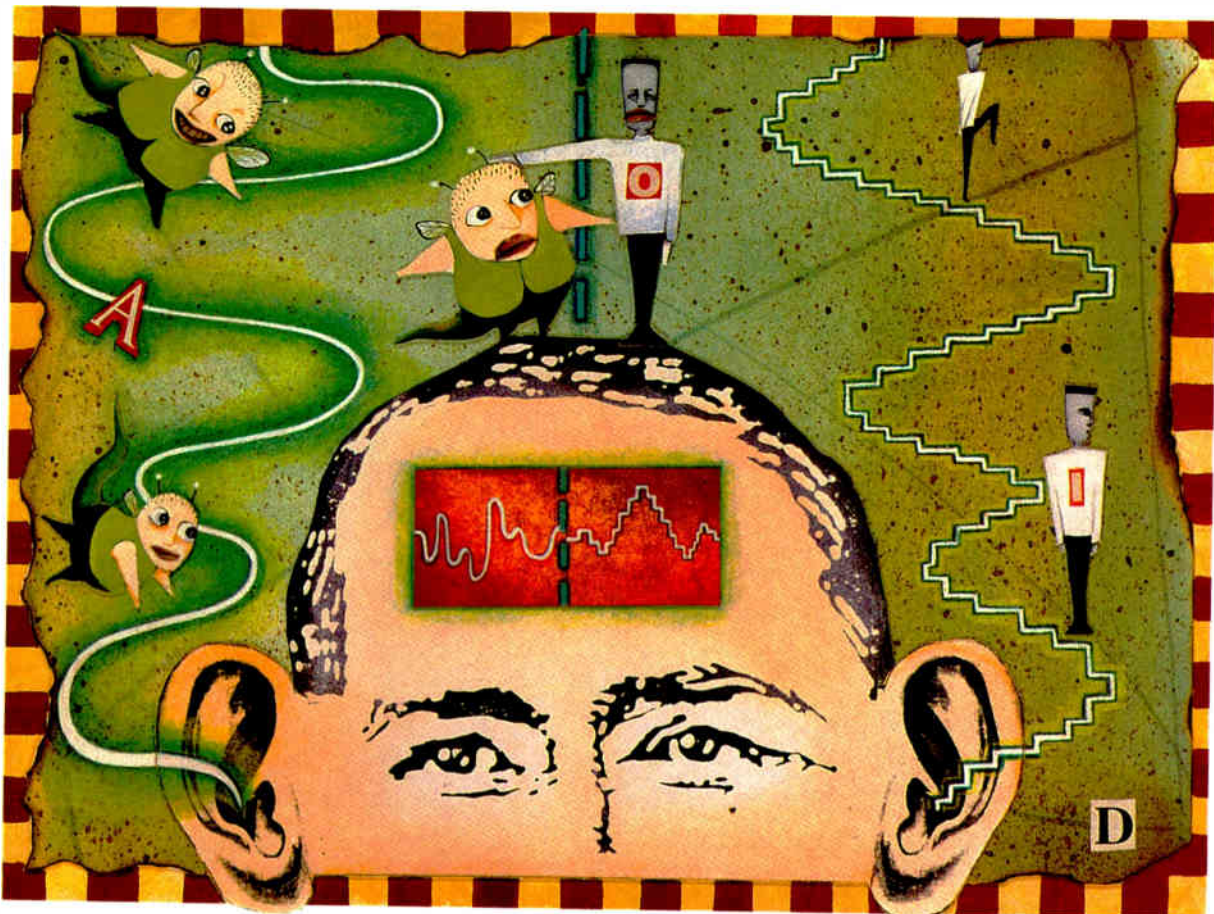


ILLUSTRATION: MARTHA CRAWFORD

INTRODUCING THE LIBRA MUSIC CONSOLE

A NATURAL

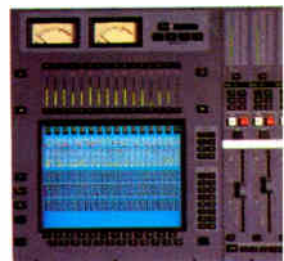
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Fully automated and entirely digital, Libra takes the maestro features of its six predecessors and adds phenomenal musical ability, at a midrange price.

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THE FAST LANE

ever-so-rare AAA CDs. Fully digital (DDD) recordings simply lack The Vulcan Mind Meld. Each track remains pristine, clean and mean. Each track, though mixed, remains unaltered by the others, isolated—with all the other tracks merely superimposed.

But an *analog* mix does something very different. It really *mixes* the tracks; they interact, they “meld” and produce a new result—an environment in which each separately recorded element actually interacts with each of the other tracks or elements. This results in each track being modified slightly by

each of the other tracks, so a sort of “commonality” is introduced, making the overall mix sound more as if it were recorded live. Not a bogus “live” recording, of course, but it’s as if the various players on the song might have at least been within sight of each other, rather than the cold hard truth: They have never even met and probably didn’t even lay down their tracks on the same weekend.

WHAT CAUSES THE VULCAN MIND MELD?

First, there is the analog record head. A ferrite core with an inductor wrapped around it, a big gap and a bunch of rust

rushing by. A “power amp” driving each track’s coil. Driving them so hard that they actually get hot! Oh yes, there is that wonderful 130kHz or so bias, which helps homogenize everything even more. Then the old playback head. *Another* ferrite core with an inductor wrapped around it, another gap (but a different size), with different resonances, different phase and noise characteristics, with the same rust rushing by, carrying the desired signal in billions of misaligned rust rods. Wow! And all these little gap/coil combos live right next to each other in a stack of 24 or more. Yeah, no interaction here.

And what do you guess the “homogenizing” factor is of all these magnetized rust chunks sitting right next to each other on the tape after you have made the recording? Rust chunks that have been magnetically arranged in one direction right up against others arranged in totally different directions? And what if they all sit next to each other for a day, a month? The result is even more marginally understood inter-

**Wine and analog
improve with age,
until they mature,
and turn to mud.
Beer and digital,
on the other hand...**

action—proximity influence; homogenization. We all know that a tight wind produces print-through. That’s why we all learned to wind slow and loose, or better yet to store un-rewound so whatever print-through did take place was *behind*, not in front of, the signal. If these particles have enough gauss to print through the tape binders, the anti-print-through layer and the thick backing layers, imagine what they do to the other particles directly adjacent to them. It is not as simple as the obvious high-frequency self-erasure issue; there is some “time slur” or minor low-frequency echo component generated. Well, not echo that you can hear, but LF modulation tails that generate minor AM, and possibly some FM components as well.

Then there is tape aspiration artifact. It has been decreed by those who de-

—CONTINUED ON PAGE 218

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It all started with the Summit TLA-100A tube leveling amplifier. If you bought one back in 1985, it's probably still working. And, worth more now than what it cost new.

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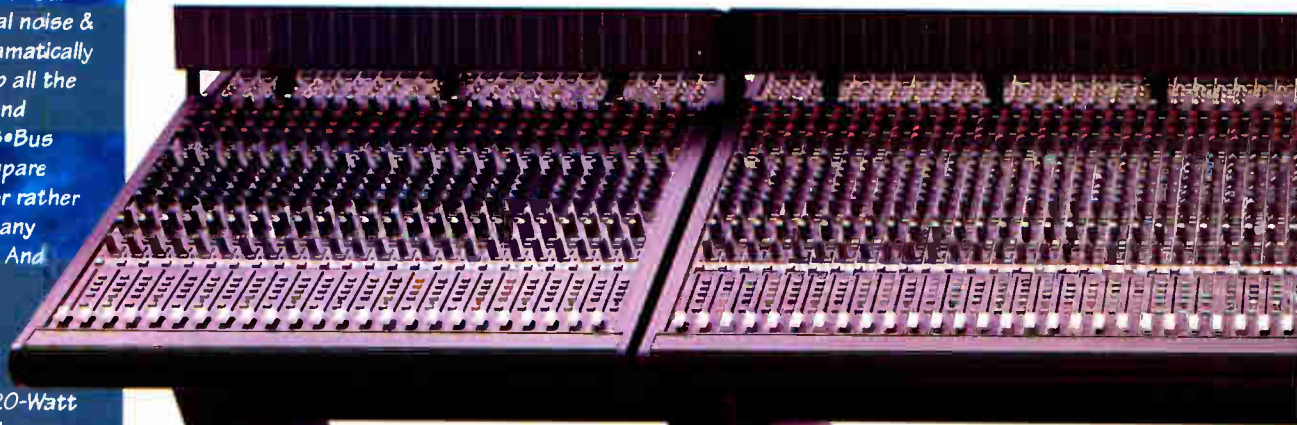
7 REASONS TO BUY OUR TO MIX MORE CREATIVELY,

1 **V LZ 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 B•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 B•Bus & 24•E expander.

2 **IT EXPANDS ALONG WITH YOUR NEEDS AND BUDGET.** You'd be surprised just how many B•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•B or 32•B and then grow your B•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 B•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•B with optional MB•32 meter bridge and stand.

7 **MAC® & WINDOWS® 95-BASED AUTOMATION THAT'S RELIABLE, PROVEN AND AFFORDABLE.** Along with affordable digital multi-track recorders, the Mackie B•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

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.



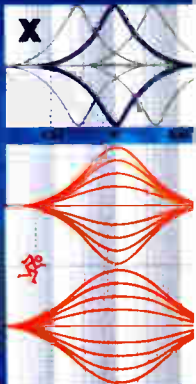
3-BUS CONSOLE... AND 2 TIPS ON HOW EFFICIENTLY AND, WELL, MORE FUNLY.*



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. lang', 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.

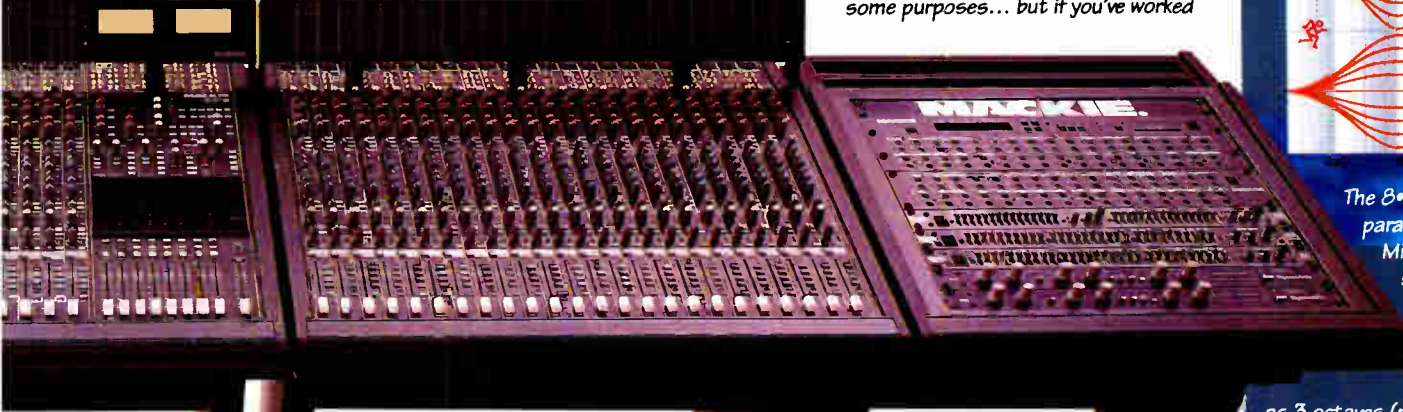


The 8•Bus' true parametric Mid lets you spread the bandwidth out to as much

as 3 octaves (red curve above). That extra octave of "width" gives you a whole new creative palette.

* Patetic license applied for.

† 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.



Above: 24•E 24-ch. expander with optional MB•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
- Automate 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.



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World Radio History

A TALE OF TWO COUNTRIES

REQUESTS FROM FAR AFIELD AND CLOSE TO HOME

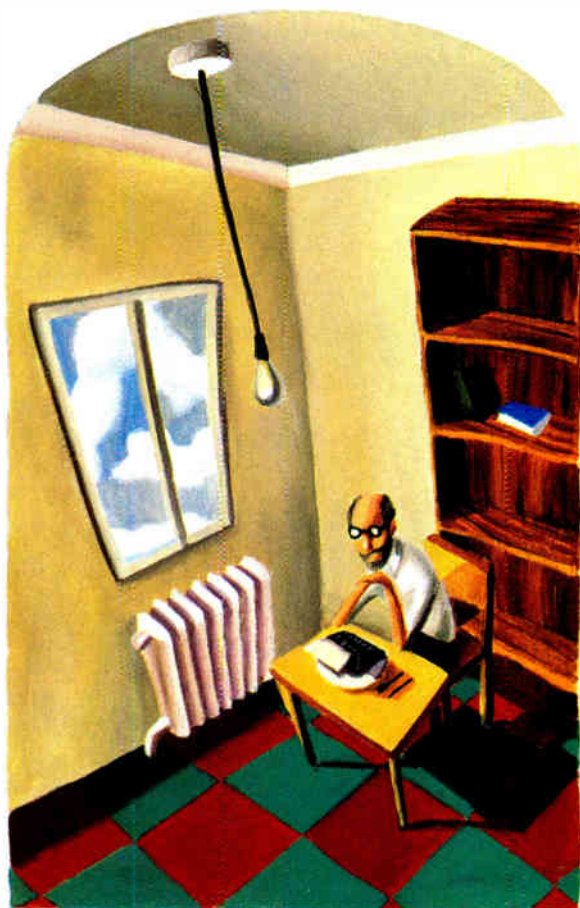


ILLUSTRATION KITTY MEEK

Sometimes it's a new song on the radio, sometimes it's a new piece of gear, sometimes it's the death of someone you know or admire. Once in a while, something crosses your awareness that makes you stop, really stop, and think. Last month, for me, it was two things: a letter and a phone call.

The letter was from a research associate in anthropology at a large Russian university. Written in excellent (although unmistakably Russian-accented) idiomatic English, laser-printed and addressed to my school office with nine-digit ZIP code, it contained a remarkable plea.

"As I do ethnomusicological research and often use a synthe-

sizer for making demos and presentations," the gentleman wrote, "I have somehow been drawn into MIDI stuff. There is absolutely nothing published on MIDI in this country, so I learn it by myself, relying on what I can order through the West through interlibrary loan...I came across your book *MIDI for the Professional*, which I found most comprehensive and most helpful in all respects. I ordered it three times for the past year and wrote down for myself as much as I could. But, alas, I cannot do that anymore, for they let you order any single book no more than three times. I could not copy it either, because the xe-

roxing of the loaned books is not allowed for copyright purposes, and they also would not let me take it out of the library.

"For this reason, I decided to ask you, dear Dr. Lehrman [I'm not a "Dr.," but all of Eastern Europe doesn't have to know that], to send me, if possible, a copy of this outstanding book (of course, if you happen to have a spare copy).

"Please excuse me for such an impertinent request, but there is, frankly, no other way I could obtain the book. Unfortunately, I am not able to buy it from the publisher, since the price comes up to nearly half of my monthly salary (oh yes, Russian academy is surviving the worst days now).

"I hope you understand the

BY PAUL D. LEHRMAN

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complexity of my situation. I just cannot tell you how much I would like to have this book at hand... On the other hand, if you cannot send me a copy for any reason, I will understand, and I appreciate the knowledge I have managed to get from the book anyway. Thank you. With best regards, sincerely..."

I sent him a copy of my book. I figured, even if he's a scam artist and he wants to sell it and make some money, I've got to admire his *chutzpah*. But I don't think he is.

When I showed the letter to the dean of my college, who was recently in Russia and has seen the state of the "academy" there firsthand, he threw in a couple of other books on music technology, took the package to the post office himself, and paid the airmail postage out of his own pocket. I hope the package is there by now, and I hope that it hasn't, as several colleagues warned me might happen, been stolen.

Meanwhile, I had been running an ad in a local paper offering some no-longer-needed equipment for sale. About a week after the letter from Russia came, I got a phone call from a fellow who said he "wanted to discuss the capabilities of the system." What he really wanted to do was pick my brain—he didn't know anything about me, but he figured that because I had some computers and studio gear for sale, I must know what I was talking about. The fellow writes music, he explained, and has an analog multitrack that he is looking to replace with a digital equivalent, using a couple of thousand dollars he's expecting to get back from the IRS. He couldn't decide, however, between a stand-alone hard disk system, a computer-based system or a modular digital multitrack tape deck. Our conversation went something like this:

Me: What kind of music do you do?

Him: You know, acoustic, guitar and voice, and maybe some synth and a drum machine.

Me: So you use MIDI?

Him: Yeah, I got a Korg module.

Me: And what SMPTE interface do you use?

Him: What's that?

Me: Well, how you get the tape to sync with the synthesizer?

Him: Oh, I just play in the parts to the tape.

Me: So you don't use a sequencer.

Him: No, everyone tells me that sounds bad.

Me: How did you decide on the Korg module?

Him: A friend of mine told me about it.

Me: What do you do with the finished tapes?

Him: I make CDs.

Me: Oh, you have some records out?

Him: No, I send my masters to a guy in Texas, and he does them for me.

Me: So then you sell the CDs?

Him: No, he just makes one at a time. Charges me a dollar a minute.

Me: Why do you do that?

Him: I think it's more, like, impressive when I go to a record company to show them my CDs.

**Once in a while,
something crosses
your awareness
that makes you stop,
really stop,
and think.
Last month, for me,
it was two things:
a letter and
a phone call.**

Me: But if you only have one of each, you can't give them any.

Him: Yeah, that's right.

Me: So what do you give them?

Him: Well, I haven't actually gone to any of them yet.

Me: Why do you want to get a digital system?

Him: I hear it sounds better than the [he names his analog tape deck].

Me: What don't you like about the sound of that deck?

Him: Uh, nothing. I just hear it's better to go digital. And I need more tracks.

Me: Do you know that the hard disk system you're looking at has the same number of tracks as your analog deck?

Him: Yeah, but it's digital, so I can expand it, right?

Me: Actually, no, you can't.

Him: Gee.

Me: What else would you like to know about the computer I'm selling?

Him: Well, like how fast is it? Is it faster than [he names a low-cost hard disk system]?

Me: I don't know what you mean by that. They'll both handle the same number of tracks.

Him: But does one work faster?

Me: As far as I know, they both play at the same speed. The hard disk system has eight outputs, but the computer hardware has four.

Him: So the computer is only four tracks?

Me: No, four *outputs*. Actually, with the right software, it will handle 16 tracks.

Him: How do you get 16 tracks out of four outputs?

Me: Listen, do you have any literature on any of this stuff?

Him: I have a brochure on [he names a MIDI/audio sequencing program].

Me: Oh, so you *do* want to do MIDI sequencing at the same time.

Him: Gee, I don't know. This guy who gave it to me said it was a cool way to mix audio.

Me: Have you gone to a music store to look at any of this stuff?

Him: No, I just have some brochures. I called the company and asked them if their stuff will do what I want.

Me: Did they tell you that you can buy an audio editing program for one-third the price?

Him: I can?

Me: Tell me, what magazines do you get?

Him: Like what?

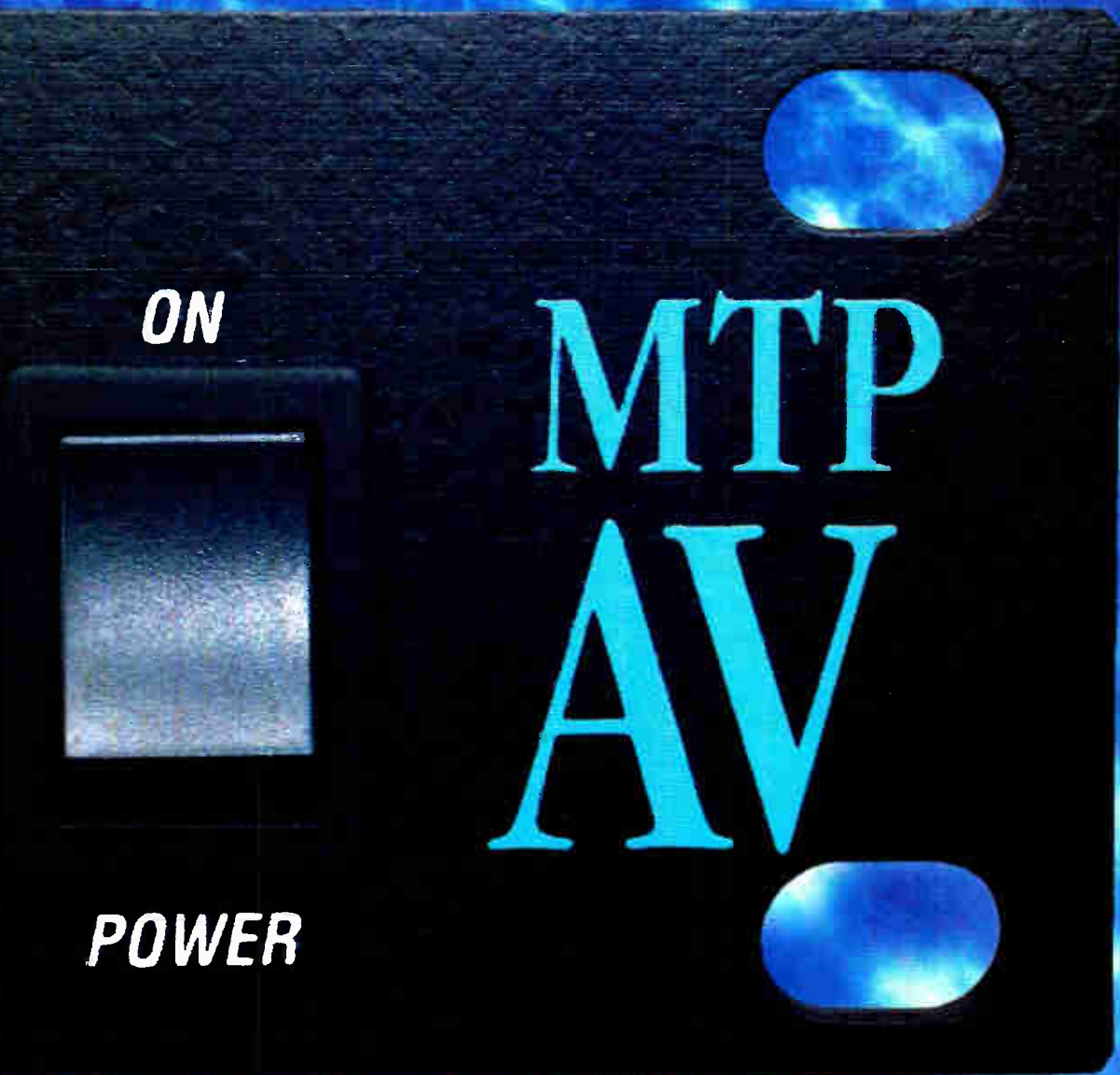
Me: You know, *Mix*, *Electronic Musician*, *EQ*, *Keyboard*. Do you read those?

Him: No. I think I've seen them, but I don't get them.

Me: Why not?

Him: Oh, I thought I could just figure it out by myself.

Obviously, he is wrong. I doubt I'm going to sell him anything, and in all good conscience, I wouldn't really want to. When I hung up, I couldn't help comparing him to my Russian correspondent. The American believes he is doing things his own way, but actually he is waiting for someone to come along and tell him what to do with his couple of thousand dollars. Unfortunately, all that is getting through to him is vague, incomprehensible hype. The companies he is talking to are doing their jobs, trying to sell him their products, but he refuses to look beyond what they're telling him, to find products that will really work for him. He is surrounded by information, in the form of books,



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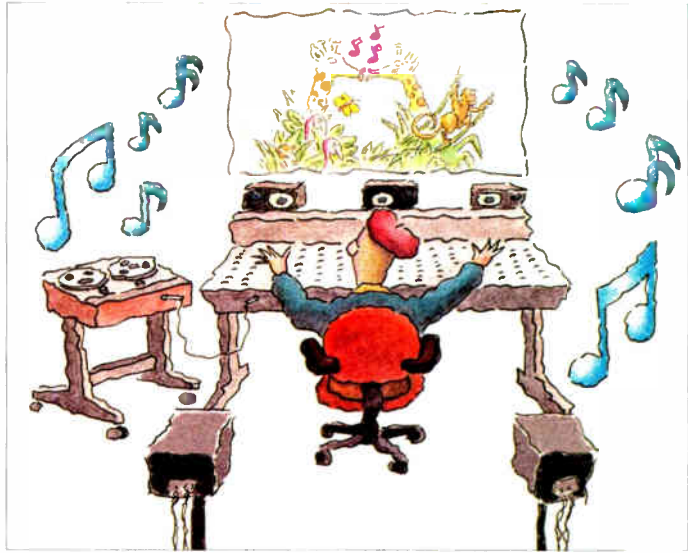
magazines, dealers and online services, but he refuses to make the effort to even look at it.

Over in Russia, on the other hand, is a system designed to *prevent* access to information. While the old autocracy at least saw to it that some few select scholars and scientists got the tools they needed, in the neocapitalist chaos that is Russia today, it seems the only people who can afford to buy anything are those who have managed to attract investment from Western corporations or, in a tragically comic adaptation of one all-too-visible facet of Western civilization, to extort funds from their fellow citizens. Government support for education has been decimated. My correspondent gets no magazines, can go to no knowledgeable stores, has no access to a modem, a fax or even a photocopier. And he certainly has no funds burning a hole in his pocket. Yet he is going to pursue his goal and figure out a way to continue his research, despite the fact that it will never make him rich, and even if it means begging someone he doesn't know, thousands of miles away, for scraps of information.

People I know who have been to Russia lately say he is very brave just to stay in his country. The old barriers to emigration are down, so it could be loyalty to his homeland, or personal concerns, or fear, or a combination of these that keep him there. Someday, as tens of thousands of Russians already have, he might decide it's not worth it any more and emigrate to a land of relative plenty. Perhaps he would show up at my door, looking for help, or a job. And perhaps at the same time, the fellow who can't be bothered to pick up a magazine or talk to a dealer, who's willing to let his artistic decisions be dictated by rumor and hype, who's perfectly happy abrogating all responsibility to himself and his muse to those who know far less than he about what is best for him, would show up as well. I know which one I would welcome into my house and which one I would turn away. ■

Paul D. Lehrman teaches at the University of Massachusetts Lowell and is co-author, with Tim Tully, of MIDI for the Professional, published by Amsco, and available from Mix Bookshelf. Be grateful that even if you don't want a copy, you know where to get it.

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The Class of '96

A LOOK AT 21 OF THE YEAR'S NEW ROOMS



PHOTO: PAUL VARRAS

New York City's Gallery Recording Studios was designed by Sam Berkow and Arus Inc. (the design wing of Systems Development Group) and opened in March. The main studio is a large, live room with a brick wall and cherry wood flooring. The control room is based around a 144-input automated Trident 90 console with moving faders and includes two Studer 827 2-inch decks and a Quested HQ-410u monitoring system.

John Brasher & Associates, Glendale, Calif. Designed by McKay Conant Brooke, Stage 2 features a 72-input LaFont Chroma with Optifile Tetra automation, an Akai DR-8, and outboard gear including Lexicon, Publison, Quantec and BSS. This room is also equipped for 35mm and video projection and handles Dolby Digital, DTS and SDDS formats.



PHOTO: GARY PARKER

The Sega Music Group, San Francisco. Sega Music's Studio B, inspired by the studio bau:ton design of Studio A, features a Mackie 56-input 8-Bus system with 68 channels of Ultramix™ Universal automation, Pro Tools III, ADAT XTs and SampleCell II. Monitors are Genelec 1032s. Tielines connect rooms A and B to each other and to a skylit performance room.

PHOTO: JAM LERSCH/LESCHE PHOTOGRAPHY



The A room at Caravell Recording in Branson, Mo., includes a 56-channel Euphonix CS2000M, a Sony/MCI JH 24-track, 48 tracks of ADAT with BRC and UREI, KRK and Tannoy monitors. Originally constructed in 1984, the facility was recently upgraded by studio VP Rodney Dillard and designer Steven Durr and re-opened in October '95.

Reggae combo Inner Circle built a private, two-control-room studio in Miami, designed by John Arthur of Inraspect 7 Design and completed in May. Pictured is the API room, with a 64-input Legacy complete with Uptown moving faders. The room also offers Genelec 1035 monitors and Sony 3348 digital and APR 24 analog recorders.

PHOTO: MARK DAMOND/REN CENTRO FOR DIAMOND IMAGES



Mad Dog moved into a new, 3000-square-foot facility in Burbank, Calif. The Chris Pelanis-designed studio features a 48-in Neve 8108 with custom patchbay and Necam 96 automation, an MCI 2-inch 16-track and a Studer A800. Tielines connect to a 40x60-foot soundstage and a 1,000-square-foot recording room with three iso booths.

Opened in January, new San Francisco audio post facility Dubeytunes was designed by studio bau:ton. Pictured is the Blue Room, equipped with an Amek Big automated console with virtual dynamics, 32 channels of Pro Tools III, 16 tracks of DA-88 and Dynaudio/Transnova surround monitoring.

PHOTO: STEVE LEWINGS



PHOTO: BOB GERB



Located on a 56-acre farm in rural Argyle, N.Y., Sweetfish Recording Studios opened its expanded, 2,000-square-foot studio and control room in July 1995. John Storyk designed the facilities, where the centerpiece Neve 8068 with GML moving fader automation is complemented by an Otari MTR 90III 2-inch 24-track, 24 tracks of ADAT with BRC and Tannoy System 215 DMT monitors.



PHOTO: BILLY DER PHOTOGRAPHY

As part of a complete facility overhaul, San Francisco's Robert Berke Sound remodeled its Studio B, working in consultation with original designer Randy Sparks of RLS. Completed in June '95, the post room now includes an automated Otari Status console, a 24-track Timeline DAW, 80, 16 tracks of Tascam DA-88 and JBL surround monitoring.

Glenn Sound in Seattle is a new post/ADR/music-recording facility designed by Studio Pacifica Ltd. Major equipment includes a 16-channel AudioVision system, Pro Tools III, Tascam 3700 and 24 channels of DA-88. Monitors are KRK, Audire and Crest; outboard gear includes Focusrite, Symetrix and UREI.



PHOTO: REBECCA W. LOWELL



PHOTO: DEREK RATH

NRG Recording Services, North Hollywood. The Moroccan-motif Studio B was completed by Studio 440, and opened in November 1995. Gear includes a 64-input custom Neve 8078 with flying faders, Private Q headphone mixers and custom Dynaudio M-4 monitors. The room is decorated in Indian silks with lanterns and tables from Morocco.



Named for its inspiring river view, the Hudson Suite of Chung King's new Varick Street Studio was completed this February. The studio was designed by owner John King and Frank Commeatale and features a 72-input Neve VRP with Flying Faders, Augspurger 215 mains, and 48 tracks of both analog and digital Studer recorders.

The main control room at Toyland Studios in Piqua, Ohio, was designed by Arus Inc. Equipment includes a 56-input Eurphonic console with 32 channels of dynamics, 24 tracks of ADAT XT, 8 tracks of Pro Tools and six racks of outboard gear. Monitors are Tannoy mains and Genelec near-fields. The rear, live-end wall is treated with Systems Development Group's Art Diffusors®.



PHOTO: TOM HUMPHRY/APERTURES INC.



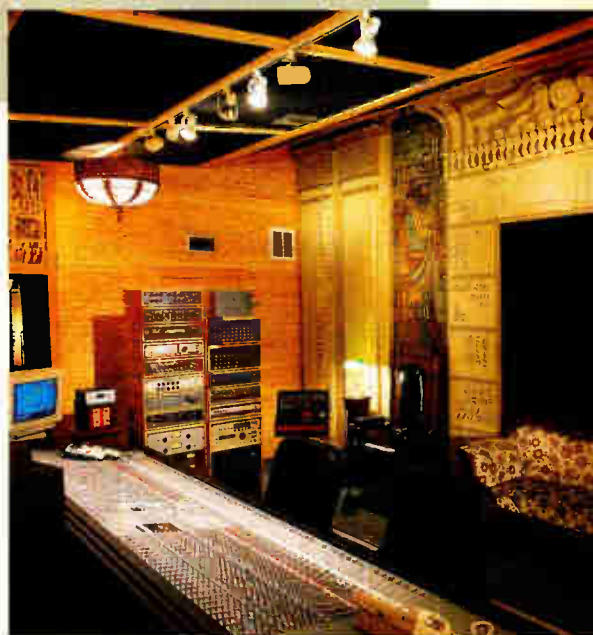
PHOTO: BOB ROSENZWEIG

John Storyk of Walters-Storyk Design Group designed new facilities for Echa Beach Studios in Jupiter, Fla., which got up and running this spring. Studio A features a 56-channel Amek Mozart with Neve modules and Supertrue automation, a Studer Dyaxis Multidesk along with Sony and Fostex recorders, and Tannoy 215 main monitors.

This studio bau:ton-designed 48-track room is part of a new, 11-studio complex at the Los Angeles Recording Workshop, North Hollywood. The console is an SSL 4000 G Plus with Total Recall and Ultimotion moving fader automation; other gear includes a Studer A827, Otari MTR-90, Lexicon 300L and PCM 90, and Pro Tools III with PostView and MasterList CD.



PHOTO: ED COLVER



American Sector Studios in New Orleans is housed in a former Masonic lodge, built in 1922. Studio A, re-opened in April, was designed by Michael Blackmer, with acoustics by Bob Hodas, and includes an SSL G Plus 4064 with Total Recall and Ultimotion, Dynaudio Acoustics M3 mains and a Studer A827 24-track.

In creating his Upstate New York private facility, Loon Echo, producer Mutt Lange worked with designer/consultants Harris, Grant Associates. Sister companies Discrete Systems and Coastal Acoustics supplied the technical facilities and a stereo Boxer T4 monitor system, respectively. Equipped with an SSL 9000 J Series console, a Sony 3348 digital 48-track, 48 tracks of SSL DiskTrack and a Studer A800 24-track, the facility came online early this year.



PHOTO: NICK PRICE



PHOTO: GORDON CLARK

Southern California's Ear to Ear relocated to a new 6000-square-foot facility in Santa Monica and re-opened in January. Designed by Brett Thoeny of BOTO Design, the studio houses three control rooms, including the Red Studio, equipped with a 56-input D&R Orion console, Genelec 1031A monitors, a Spectral Synthesis 16-channel DAW and 24 tracks of Tascam DA-88.

Broadway Sound, a new division of Broadway Video in New York City. Facilities were designed by the Downtown Group; all rooms feature Sonic Solutions MediaNet workstations, digital video and extensive MIDI and outboard gear. Studio A, shown, features a Soundcraft console, Genelec monitors, a large vocal booth and a window overlooking Broadway.



PHOTO: PETER MAUS



PHOTO: DERRICK RATH

Pacific Ocean Post, Santa Monica, Calif. POP's Bay 2, a digital component edit boy, was redesigned this year, by BOTO Design Inc. Featured are an Axial Editing System with RAVE nonlinear assembly, Sony 8000 digital video switcher, Discrete Logic Flint, Graham-Patten D/ESAM 400 digital audio mixer and surround sound capable EXAKT monitors from AID.

Whitney Houston enlisted the Rass Berger Design Group to design a personal recording studio at her New Jersey estate. The control room, shown here, is based around the first-ever built SSL 9000, and features a 48-track Studer digital multitrack deck and 24-track analog deck, and RPG Diffusor blocks. Monitors are custom Questeds.



PHOTO: DOUG TOMARSON

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**HELP
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ACOUSTICALLY CHALLENGED

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SURFACE TREATMENTS TO THE RESCUE

BY SARAH JONES

You've finally got that hot session guitarist in your studio, and she's cut some shredding licks that would put Yngwie Malmsteen to shame. You notice, however, that during playback you hear a slight ring in her tone. That's funny, it sounds a lot like the ring you heard when recording that jazz trio last month. Now that you think about it, hasn't that ring been there a long time? As long as you can remember?

It could be that your room itself is the source of that ring. Or that rumble. Or worse yet, that dreaded slapback echo. Less-than-optimal acoustic properties in any studio, big or small, can contribute to a variety of sonic anomalies.

Design and construction issues aside, the best method of controlling the acoustics of your studio involves achieving the correct balance of absorption, diffusion, isolation and reflection of sonic energy. The proper application of surface treat-

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ments can be effective at achieving this balance. However, some room assessment is needed in order to determine the ideal materials for your situation.

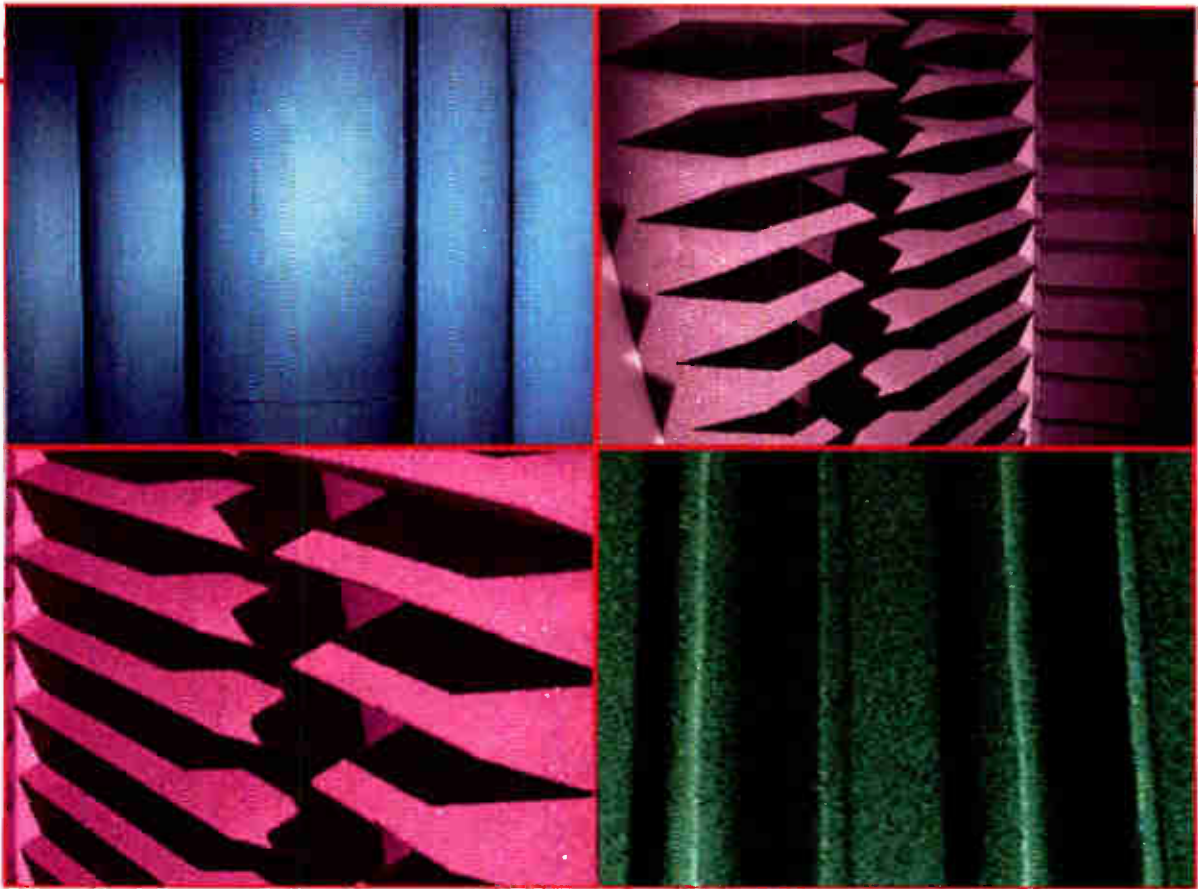
There are many factors to consider when evaluating the acoustical parameters of your studio. Overall, the frequency response and reverberation time should be optimal for your particular needs (recording, mixing, etc.). Ambient noise should be minimal. You also need to examine specific aspects of your room's behavior. Is it free of flutter echoes, standing waves and resonances? Is there an ideal balance of direct-to-reflected energy, and is reflected energy uniform? Is reverb time consistent at all levels?

Some research is necessary before choosing acoustic materials for your studio. The right product, properly applied, can work wonders to improve a sonic environment. However, the same product may complicate a problematic situation if used inappropriately. The following is a partial list of materials available; it should give you a starting point in your search for the products that meet your acoustical needs.

ACOUSTIC FOAM

Foam is a studio staple; it's simple to install, cost-effective, and although (contrary to popular be-





lief) not suited for soundproofing, is highly efficient at attenuating mid-to-high frequencies, as well as minimizing reverberation and early reflections. Foam is available in a wide variety of chemical compositions, dimensions, surface patterns, colors and flame-retardancy ratings.

Alpha Pyramid™ acoustical foam from **Alpha Audio** (Richmond, Va.) is an absorbent foam with a uniform, pyramid-pattern surface. Made of open-cell polyurethane, Alpha Pyramid is available in 2x2-foot

sheets, in 2-, 3- or 4-inch thicknesses, and in four colors. NRCs range from .70 to 1.05. Also from Alpha Audio is Alpha Wedge™ acoustical foam, which is more absorbent at lower frequencies, due to its thicker base and increased surface area. NRCs for Alpha Wedge range from .80 to 1.25.

Studiofoam™ from **Auralex** (Fishers, Ind.) is a line of absorbent wedge-surface panels, sold in 2x4-foot sheets, available in 1-, 2- and 4-inch thicknesses; as well as a 12-inch-thick model, the Venus Bass Trap.

WHAT DO THE SPECS MEAN?

Acoustical materials are given ratings for various properties, including absorption and transmission of noise. These numbers are meant to be used as guidelines, as they are often the results of testing performed by independent control environments that do not take into consideration the variables inherent in the average studio. It's also important to remember that the ratings are averages of performance values at different frequencies, and those values can vary widely from octave to octave, depending on the material. Two specifications that you will come across often:

NRC stands for Noise Reduction Coefficient, a numerical rating that represents how much sound energy is absorbed by a given material. The NRC is actually an average of absorption values at various center frequencies between 125 and 4k Hz (not an absorption value across the bandwidth!). The higher the NRC, the greater the absorption. For example, a concrete wall has an NRC of 0.01 at 128 Hz and .035 at 4k, but an overall NRC of .023.

STC, or Sound Transmission Class, specifies the amount of sound (in decibels) blocked by a barrier and generally applies to dense, hard materials or walls. STC is an average of transmission loss values taken from center frequencies across a wide bandwidth. Some examples: Brick walls often have STCs in the 50 range; a ½-inch plate-glass window may have an STC of 30. ■



The foam is chemically tinted and comes in a variety of colors. Auralex also makes Sonomatt™, a convoluted-surface "egg crate" foam panel sold in 4x8-foot and 2x4-foot sheets, all 2 inches thick. It's available in charcoal gray. Wedgies™ are a smaller version of Studiofoam, with a higher concentration of surface wedges, useful for spot treatment. LENRD™ bass traps are triangular

wedges of Studiofoam, designed for corner placement. All foams are Class B-retardant; NRC ratings range from .50 to 1.35.

illbruck (St. Paul, Minn.) manufactures the SONEX line of products. SONEX panels are designed to be mounted on walls, partitions or barriers. Surface patterns include anechoic-wedge and pyramid designs, and a number of thicknesses, sheet sizes and colors are available. New SONEX products include SONEXgraphics™, which integrate custom surface printing of four-color artwork/photographs; and SONEXcolortec™, a color-saturated (as opposed to painted) foam. All SONEX

panels are fiber-free and Class 1-rated.

NetWell Noise Control (Minnetonka, Minn.) makes polyurethane pyramid-surface foam panels, cut into 24x24-inch squares and available in 2-, 3- and 4-inch thicknesses. NRCs are .50 for 2-inch foam, 1.0 for 3-inch foam and 1.05 for 4-inch foam. Also available are wedges, anechoic wedge "sound blocks" and FireFlex Class A foam.

RPG Diffusor Systems (Upper Marlboro, Md.) offers the Melaflex™ Series of fire-resistant melamine foam products. The Melaflex line is based on VDAC™ or Variable Air Depth Cavity, technology, which spaces most of the foam away from the mounting surface for more efficient absorption. Melaflex is designed with aesthetics in mind and looks like a design element rather than a foam panel. Three shapes are available: SoundWave, with a surface made up of sine wave-type curves (NRC=.80); SoundRound, made up of an irregular, alternating raised hemisphere pattern (NRC=1.05); and the smooth SoundFlat (NRC=.65). Melaflex is available unfinished or coated with a white- or gray-flecked pattern; custom colors are also available.

Hush-Foam is a line of urethane products from **Silent Source** (Northampton, Mass.). Hush-Foam panels are available in either a pyramid or anechoic-wedge surface pattern, in thicknesses of 2, 3 and 4 inches, with NRCs ranging from 1.00 to 1.25. Also available from Silent Source are 12-inch Max-Wedges, and Flame-X melamine panels, which meet Class 1 rating specifications.

Cutting Wedge foam from **Systems Development Group** (Frederick, Md.) is made from 2-pound-density polyester, with a sawtooth surface pattern that begins and ends with a half-wedge for seamless matching. The panels are available in five sizes, four thicknesses and in tan, charcoal or blue.

WALL PANELS

If the egg-carton look is not for you, and you'd like more flexibility in your noise-control system, consider acoustic panels. Units are generally constructed of fabric-covered frames housing Fiberglas panels, often with reversible front and back surface textures offering varied absorbency. Although generally more expensive than foam, panels are more resistant to regular wear-and-tear, such as surface tears and scratches.

AlphaSorb wall panels from **Alpha Audio** are designed to combine absorbency with durability and aesthetic

—CONTINUED ON PAGE 208

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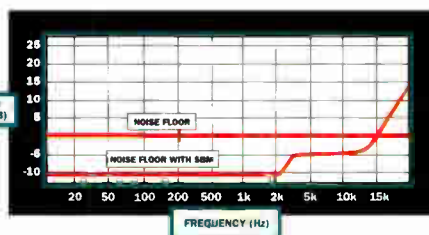
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GLENN PHOENIX

PRESIDENT OF WESTLAKE AUDIO

For just over 25 years, the name Westlake Audio has been prominent in three complementary areas of the audio industry. Westlake is most highly visible as the Professional Audio Sales Group based in Hollywood, Calif., providing sales and service for products from some 200-plus equipment suppliers. Westlake also operates a total of eight state-of-the-art recording and audio-editing facilities in West L.A. and Hollywood, serving a wide cross section of music, TV/radio, motion-picture and multimedia clients. The firm also designs music-recording, post-production and listening rooms, an activity that led to the development of its Manufacturing Group, which currently offers a range of loudspeaker systems for the professional and high-end consumer markets.

Glenn Phoenix, whose hand has been firmly on the Westlake tiller for the last two-and-a-half decades, began his professional career with the 3M Company. He joined the fledgling Westlake company just a few months after it had been set up by Paul Ford and Tom Hidley; Phoenix soon provided the business acumen necessary to corral and focus the success generated in those early days of multi-track recording. I first met Glenn Phoenix in the early '80s, soon after I joined the editorial staff of the late, lamented *Recording Engineer/Producer* magazine; he and *RE/P* publisher/founder Martin Galley formed a close friendship in addition to a business relationship.

Our extended interview sessions at Westlake's sales and recording complex on Santa Monica Blvd. in Hollywood recalled those halcyon days when the firm provided one-stop shopping—hardware and facility design—to



the fledgling recording community. Soft-spoken yet highly articulate, Phoenix still champions the ideal of consistency: consistency of sales and service, of studio operations and of manufacturing quality.

How did you first become involved with the 3M Company?

When I got out of the Air Force in 1966 I had already lined up a couple of jobs working in electronics at Motorola and IBM, but they were in Arizona and Colorado. So, instead of going to those jobs, I got into my car and drove back to L.A., where my parents lived in Canoga Park [west San Fernando Valley]. I sat down with the *Valley Green-sheet*, and lo and behold, there was a small ad that said: "Help Wanted—3M Mincom Division." And I went, "That's it!"

You knew of 3M as a solid "Fortune 500"-type of company?

You have to remember that at this time I was 21 years old, and my

whole experience outside of where I grew up was in the Air Force, working on bombing computers, radar systems, etc. But, while I was in the military, I purchased a [3M] Wollensack tape recorder, which I thought was the greatest piece of equipment on the planet; I just loved it.

So when I saw that ad, I knew that 3M made audio tape recorders, and I wanted to work for them. I got in my car, applied for the job and secured a position. But I soon found out that at *that* 3M plant they were making instrumentation tape recorders—2 MHz on half-inch—for the security agencies. I graduated from check-out to field engineering and, at some point, met Jack Mullin, who had originally started the 3M Division with Bing Crosby. He said he could use me so, after a few years, I went to work for him in the lab.

Do you have a musical background?

I wasn't a musician; I was in the choir in school, but that was about it. As far as recording went, I got as far as knowing that if you drag a piece of magnetic tape across a headphone you get an audio output. During my tenure at 3M, to keep myself busy at home I converted the house into a recording studio.

By then I had pretty much determined that I was an "audio" person. 3M staff were being moved to St. Paul to form a division that, eventually, reincarnated itself to handle the [DMS] digital recording system. We knew that there were tremendous changes going on there, as 3M started to discontinue whole divisions.

What made you leave 3M to become involved with Westlake Audio?

Westlake had been founded by

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Paul Ford and Tom Hidley six months before I joined the company. At that time, back in 1971/72, they were selling MCI gear. That was their original franchise—the big explosion of multi-track. Jeep Harned had just set up MCI in Florida, and Tom and Paul had a relationship with him. The truth of the matter was that MCI was undercapitalized and struggling to produce equipment. 3M, on the other hand, like Ampex, was well-financed with large production capacity. So Paul and Tom picked up the 3M franchise. Remember that prior to this time, 3M—and probably Ampex—sold their products with their own internal sales force. When Paul and Tom went after the franchise, they needed sales-oriented people that were familiar with 3M equipment. And because I had gotten to the point where I was ready for a change, I ended up joining the team at Westlake.

Paul and Tom secured the 3M franchise and then started picking up other lines. I guess they were becoming one of the first full-line pro audio dealers, before we maybe even understood the term?



The faces behind the name: Westlake Audio staff, circa 1996.

That's right. And the company did very well, mainly because we came on the scene just at the time there was a need for a Westlake Audio. Before Westlake, people just went down to Pacific Radio, or wherever it was that they bought their parts, and that was it. It quickly got to a point where Paul and Tom couldn't handle all the sales themselves, so they brought in two outside salespeople—myself and Brian Cornfield [who eventually founded Everything Audio].

Like a lot of fledgling companies, Westlake went through a learning curve about business practices. We went off in a few too many directions at once. Over a short period of time, we had a representative office in Mexico City; a staffed office in Nashville; and Tom moved to Switzerland to open an office in Montreux.

So during that time Tom Hidley was making the transition from being a pro audio dealer, which is a third of your business now, to studio de-

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sign under his "Eastlake" logo.

Well, believe it or not, when Westlake started out it was doing all these things. It began with sales of equipment because there really wasn't anyone who specialized in pro audio sales. So we started out selling gear, designing and constructing studios, developing our proprietary monitor speakers.

The recording side came pretty early on. Westlake first began operating at 6311 Wilshire Blvd., close to Beverly Hills, in a brownstone, walk-up type of building. We had real nice demo facilities. We put so much money into them that it became one of the major attractions in town. In late 1972, early '73, people started booking the mix room after hours, and that started [the Studio Group].

Customers would come to you and say that they liked what you did with your demo studio—would you build them one?

Absolutely. The company grew, and we had quite a few employees. How do you get the capital? It was a good learning experience for me. Having been at 3M, I saw the opposite of what small audio entrepreneurial companies are; I saw the organization of the Finance De-

partment, Legal Department; this and that department.

So you brought some managerial strengths to the company—structure that helped its running as a business?

Running a California corporation is an entirely different discipline from han-

fectively spun off the European office, and Tom re-created it as Eastlake Audio, which he ran until he sold it to David Hawkins.

How many studios did Westlake build during those years? Is it still active in design and construction?

The total is probably more than 100 and less than 200 throughout the world, including Singapore, Taiwan and Japan. In the old days we did the original Record Plants here and in New York, as well as Electric Lady [New York City]. Here in L.A., we also did what's now known as Cherokee, although back then it was the MGM recording facility. And, of course, the five rooms here [at the Westlake Sales facility on Santa Monica Boulevard], West Hollywood, plus Paisley Park and Flyte Tyme Studios in Adina, Minn.

I still do design and some construction, but we don't pursue it on an active basis; we do it as we find clients. We're currently involved with a studio for Lionel Richie at his house. We've also done a lot of listening rooms—many of them overseas—and we did a store for a company in Singapore.

How many studios is Westlake building a year now?

dling a construction crew, etc. Ultimately, Tom's creativity and energy outstripped the company's ability to develop capital and support it in an organizational sense. Somewhere around 1975, I secured an option to acquire a majority interest in the company, and officially became president in 1976. In the separation of its principals, we ef-

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Just two or three. Sometimes we just do the design, and I might not set foot in the studio until a year or two after they're done; sometimes we'll do the whole design and construction process. *Which of all the rooms you put together are you most proud of?*

Probably Studio D at this facility; also the work we've done at Paisley Park and Flyte Tyme.

Do you try to extend your art with each room you design? Do you like to grow and learn with each experience?

Oh, absolutely. If you're talking about just the acoustic design and construction details, of course, it's a very complex and challenging process. Most people think that it's simple. You take a speaker, for example, put it in a box, cut a hole for the tweeter and woofer, and connect an amp and crossover. For the room, you don't make the walls parallel. If you do all this, you have a good-sounding control room. Maybe not!

Where did you learn acoustics and multitrack room design?

The School of Hard Knocks! On the science level—and this is a *major* issue—a lot of people don't take the time to

study the physics of what's going on here. You can open a text book and find whatever the formulae are, but actually getting a grasp on the whole concept of air molecules in a space is complex. With magnetic tape, you can put some flux material on it and see the tracks and patterns. But the science of

**To be a professional
about cables,
one must know
the system: the source,
the load and the
interconnecting details.**

sound propagation within a room is a very complex concept. Of course, you have to study and get some technical background, but experience is essential. One thing that's given our company a lot of experience is that [Westlake] has been making loudspeakers for 25 years. If you think about it, the inside of a

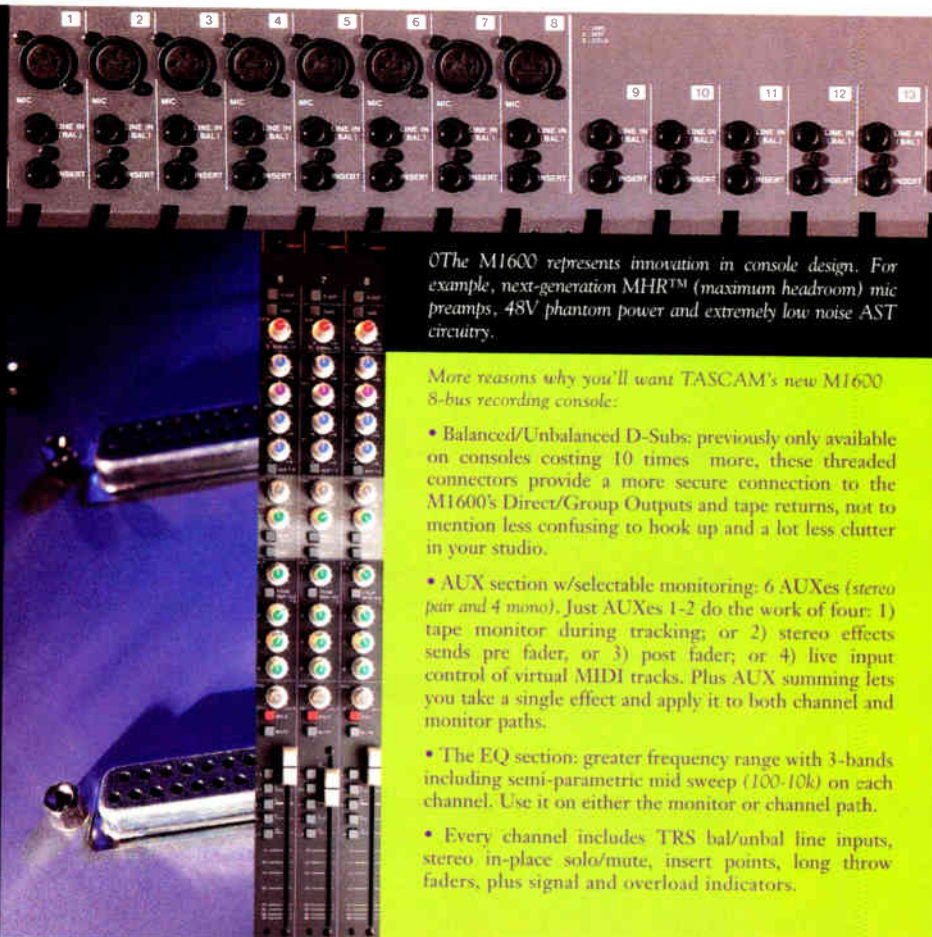
speaker is nothing more than a miniature room; all of the design considerations that go into a room also go on in building a speaker.

People sometimes give a very simplistic presentation of: "We'll just use some insulation," as though *any* insulation will work. Insulation has many properties: weight, density, directional grain characteristic; there is a myriad of parts to insulation. We feel that we have a good handle on it but, after 25 years, I'm just getting a grip on the art.

Have you reached the stage where you can pretty much predict the way a room will behave from a reasonably complex sketch, as well as a knowledge of the materials you plan to put in that room? Is knowing how the sound would behave in that room, in terms of sound reflections and arrival times to the listening position, pretty much an exercise in geometry as much as anything?

Absolutely. There is the travel-path analysis part of an acoustic design that, by and large, an astute designer will be aware of and pay some attention to. Having said that, however, we would be remiss in not pointing out that travel-path analysis is only applicable in a cer-

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- **AUX section w/selectable monitoring:** 6 AUXes (stereo pair and 4 mono). Just AUXes 1-2 do the work of four: 1) tape monitor during tracking; or 2) stereo effects sends pre fader, or 3) post fader; or 4) live input control of virtual MIDI tracks. Plus AUX summing lets you take a single effect and apply it to both channel and monitor paths.
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tain part of the frequency band, where the surface thickness that the [sound wave] is hitting is considerably smaller than half a wave length. Once it's the other way around, where the surface is getting larger than a wave length, then you have a different phenomenon other than the direct travel-path analysis.

What sort of frequency range are we talking about in which travel-path analysis is appropriate?

Depending on the size of the room, that might occur in the 300Hz range—maybe lower if the room is larger; most people agree that below 100 Hz, that phenomenon is not the relevant factor. When you start getting to those longer wavelengths, the relevant factor is the total amount of absorption within the physical volume of the room, as well as the structure's diaphragmatic characteristics. That's why if you build a room and you've got a brick wall on one side of the room and not on the other, don't be surprised if the engineer turns on the left monitor and right monitor and says that the two don't sound the same!

So if you have some degree of symmetry and you're looking for first reflections into the listening area, above 300 Hz that's pretty much taken care of

given some knowledge of the absorptive surface behind you. But below 300 Hz, you're trying to redirect the waves so they don't come back into the room—to trap them into whatever device you're going to put into the rear wall and ceiling.

Again, at very long wavelengths it's really a matter of how much of the energy you can absorb. But you can only pass a certain amount of the energy into the absorptive systems.

In reality, at low frequencies you are trying to make it seem as if there is no surface from which the sound wave can be reflected back into the room. So you redirect the wave, refract it, flare it out so that it never gets to a point where it turns around and comes back into the room?

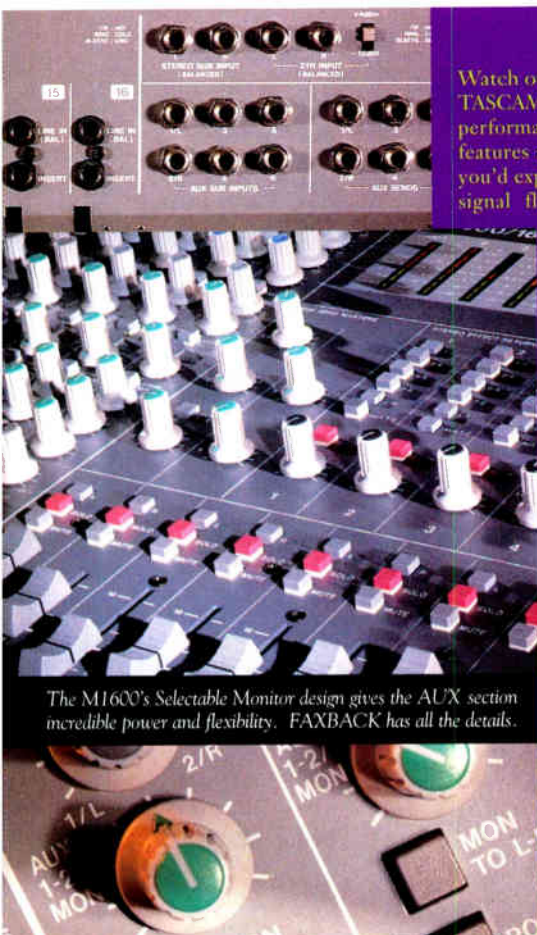
Acoustic designers have their own concepts, but if you want to get rid of or reduce the reflections, you can't send the energy into something [so that] it's not going to come back. The fact of the matter is that it *is* coming back. If you do a reverb analysis of the room, you see that it's got a 0.5- or 1-second decay time. The sound must have passed several times through the material before it [was attenuated], say 80 or 90 dB, to

where you can't hear it. The discussion by some people in this business about the "magic" traps, into which sound enters and never comes out, is a little bit naive.

Talking of marketing hype, what about the alleged differences between cable? Westlake makes its own brand. Is there a measured difference?

People say that certain things are going on within the cable, and it's very difficult to give physical evidence to refute that. We can't actually get inside of the copper and run around with the electrons, but there's some empirical evidence that can refute it.

To really be a professional about cables, one must know the system: the source, the load, and the interconnecting details of how long the cable is, what bandwidth and so on. Without addressing these matters, any discussion that Brand X or Y is a better deal is really a disservice to the client. Yes, we make our own cables. Our take is that we know what our load is, what speaker, and while we don't always know what the source is—the amplifier—we do represent many of the industry's leading amp manufacturers and have been able to measure their characteris-



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World Radio History

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The SM1 is a dual-18, five-way system. We can provide it as bi-, quad- or pent-amped. A bi-amped system will have an active 200Hz crossover, and the rest of the crossover points are high-level in the box. The quad-amp system will have everything active with the exception of the 10kHz crossover point, which again will be a high-level network in the box. Optionally, the customer can buy the pent-amp system where we provide the quad-amp [ac-

tive] crossover and the bi-amp [active] crossover.

How does the customer decide what they want?

It depends. Are we talking a pro or a consumer application? In the world of high-end consumer products, it's not unusual for customers to invest a hundred thousand dollars. We just designed a listening room for a customer in Taipei. His construction budget for the room was \$125,000. The speakers and amplifiers will cost between \$150k and \$200k. Then he'll probably have who knows how many dollars worth of D-to-A converters, etc.; we are also providing storage for 7,000 CDs.

Is the Pacific Rim an expanding market for you?

We've been in the Far East market for quite a long time. Believe it or not, our first representative in Japan back in the early '70s was Tascam. Since then, we've equipped a number of rooms in Japan, including JVC Studios—a number of facilities there use the Westlake product.

Do you design post facilities as well, not just recording studios?

Not too many, but we have done a few. There is a room out at the Eisenhower Medical Center in Rancho Mirage, which is essentially a post center. Hibino Sound in Japan also has several post rooms.

If I came to Westlake as a prospective client for a studio, what would you tell me about the company?

I'd just try to assure you that being a studio operator as well as a designer, I know that sometimes the very first consideration is the cost of the project. Sometimes doing a big deal isn't always the answer. If you can address some issues in a more simple fashion, those cost-effective solutions can sometimes be worth a lot more than the "Taj Mahal" design. I would also try to explain to you in plain English what the ramifications are of doing something. Of course, our track record is based on not just what we do but also in what we recommend you *don't* do.

Is the studio construction aspect of Westlake an important part of your business?

Not in terms of overall dollars; it's pretty much a support activity. We enjoy it. *So the core business is the dealership and, of course, the manufacturing?*

Yes.

What percentage of your turnover comes from manufacturing?

Between ten and 12 percent.

You must hold a large product inventory as part of your dealership?

If you're talking about the market value of the products, it's between \$2.5 million going on \$3 million.

How many lines do you currently carry?

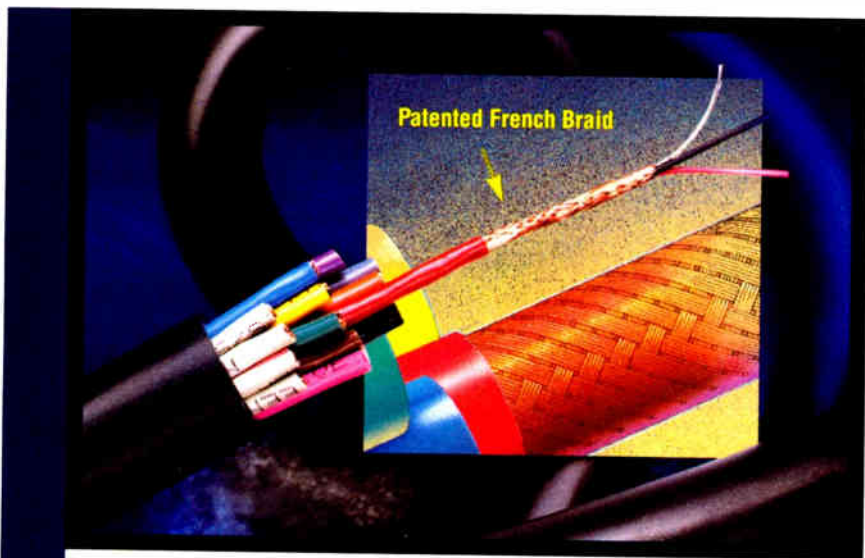
Around 200.

How big is your sales team?

Excluding myself, we have 11; ten here [at the Santa Monica Blvd. location] and one in Newbury Park [at the manufacturing facility].

You have people that have been with you for many years?

Margy [Mark] has been here 14 years, and Glenda [Myers], our accounts payable person, has been here 18 years.



Your snakes will bend, twist, coil and slither more freely than ever before with new AudioFLEX cables from Belden. They'll make all the right moves, with unsurpassed flexibility, to improve cable handling in your session or studio. These new multiple-pair snake cables feature a patented French Braid Shield design, delivering new highs in flexibility and new lows in triboelectric noise. And that, of course, means crisper, cleaner sound along with easier handling. 24 AWG AudioFLEX cables are available in 2, 4, 6, 8, 12, 16, 24, or 32 pairs, each individually shielded and jacketed.

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We have a normal turnover of people who want to extend their horizons. Westlake alumni include Ed Cherney, Brian Reeves, John Lawrence, Steve Hodge, Chris Carey, who's head of Disney's sound department, Robert Winder, who's just taken over at Warner-Hollywood...the list goes on. I don't necessarily want to think that they will only be with us for a short while; that we'll train them and then they'll go off and do something else. But the fact of the matter is that Westlake is very visible, and there are a lot of opportunities—be it as a recording engineer or producer, or starting their own company.

Is it a house rule that the recording studio side of the business has to be treated strictly off-limits and separate from the pro audio sales side?

We have different staff here. While there is some common support staff in terms of general management, the studios have their own studio manager, traffic manager and so forth; they are in control of the studio facilities. If a salesperson needs a room for demonstration, they have to check with the

studio-traffic people and then book the room just like a client.

Michael Jackson did all the pre-production here on the *Dangerous* album, and we worked with him on the *HIStory* project [with producer/engineer Bruce Swedien]. When Bruce started the *HIStory* album, he went through his monitor situation again and decided that the BBSM would be their reference monitor; they have two or three pairs that they carry to each studio they go to. Bruce also likes Studio D because he knows the room very well.

What does the future hold for Westlake—the studio division, manufacturing division, and pro audio sales division?

If you look to the past, one of our salient points is consistency; for the future we will try and maintain that consistency. There are certain trends that continue in the studio area; with more and more home studios being built, mainline facilities will have to provide services that musicians/producers are not finding at home—be it a higher investment in capital equipment, be it more space, support activities and so on.

In the sales end, we'll continue to support and stay with the current prod-

ucts, and offer the selection, service and price the clients require. For the manufacturing side, we will continue to offer what we consider to be the very best high-end speaker products.

Who do you admire most in the pro audio business—maybe Jack Mullin?

Well, Jack was the first mentor for me and I have total respect for him; certainly a lot of electronic techniques rubbed off by just hanging with Jack for all those years. Certainly I have a lot of respect for people who are doing a good job in the studio industry. We've good local competition here [in Los Angeles] with Buddy Brundo [owner of Conway Studios], Allen Sides [owner of Record One and Ocean Way], a number of other facilities. I have the highest regard for anybody that's still currently in business in today's very tough economic climate!

If you could be reborn as anybody in history, who would you be?

I guess it would have been fun to have been Edison, and play around with light bulbs. ■

Mel Lambert heads up Media&Marketing, a consulting service for pro audio firms and facilities.

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World Radio History

KITARO'S RECORDING STUDIO

IT WAS A BEAUTIFUL DAY HIGH IN THE COLORADO MOUNTAINS. In the trees next to a lake there was drumming. The drummers included a general contractor, a carpenter, an electrician, a studio equipment dealer, a studio designer (me) and Kitaro, the internationally renowned musician from Japan. A new studio was going to be built on this spot, and several trees had to be removed to make room. We had given each tree a little sake, and for the next hour, we all drummed for the trees. Afterward, we also enjoyed the sake. This was not going to be an ordinary studio design project.

Kitaro is known as a composer and performer of what he refers to as "modern classical music." He has been a Grammy nominee and has sold more than 11 million albums. Besides his own albums, Kitaro has produced many projects for other acts and created the soundtracks for numerous films. He recently won a Golden Globe Award for the soundtrack to Oliver Stone's *Heaven and Earth*. And Domo Records has introduced World of Music, a new series of compact discs produced, arranged and in some cases written by Kitaro, recorded in his studio.

When we first met, I was quite surprised to find that Kitaro had a huge vintage 32x24 Neve console in the master bedroom of his home. I was even more surprised when I went into the master bath and found a 32-track Otari digital recorder in the tub alongside the Synclavier rack, which was perched on top of the commode.



PHOTO: PETER DOKUS

His new studio, called Mochi House, is located on a pristine property 9,200 feet up in the Rockies. Several homes and a lake full of large trout are located on the property. The views of the Continental Divide are breathtaking—it is so close that you feel as though you could reach out and touch the snow-capped peaks.

Kitaro had a vision for his new studio—not the specific details, but he knew the sound that he was looking for and how he wanted it to feel. This studio was to be strictly a personal-use facility, so the goal was to tailor it to his needs. He owns a vast collection of instruments from

all over the world, including horns, strings, percussion, keyboards, the beam, and some that I can't even categorize. He also owns three very large, 200-year-old taiko drums that produce very low frequencies, so the room had to support their sound. He further needed to physically house all of his musical instruments, and the room had to be capable of fitting a symphony (it

BY RICHARD ZWIEBEL



Kitaro's studio during different stages of construction

would also be used for rehearsals prior to a tour).

We knew that this would be a high-volume room. To get the "large room" sound required a high ceiling and optimum proportions of height vs. length and width. The location is absolutely silent, most of the time, except of course when the very common 100-mile-an-hour winds are blowing. Producer-engineer Gary Barlough (co-producer of Kitaro's *Mandala* and *An Enchanted Evening* albums, as well as *Heaven and*

Earth), oversees the studio and provided an enormous amount of insight into the details of how he and Kitaro work. This information was incorporated into all facets of the studio design.

Our first proposed design was a five-sided building that included a control room, two isolation booths and a main studio. After Kitaro returned from recording symphony tracks for *Heaven and Earth* at the Warner Bros. soundstages, he felt that he needed a larger studio. He wanted a room where he could experiment freely, and he wanted to be able to explore

different microphone placements, as well as have the freedom to locate instruments in different acoustical spaces. I redesigned the facility to have a very large main studio. To withstand the extreme winds, the design included double-grout-filled block walls and a concrete roof.

While this accomplished our goals of a large, quiet recording space, it did not have the "right feel"—a large cinderblock building did not fit in with the environment and would have a cold feeling. So we canned that idea. Kitaro believes in Environmental Architecture, and he felt that logs had the right look and feel, so the decision was made to build an all-log studio. Logs would not be silent and rigid in 100-mph gusts, which meant that quiet acoustic instruments could not be recorded during extreme wind storms. But this seemed like a small price to pay.

Kitaro's 1995 world tour was set to begin soon, and the decision was made to rehearse in the studio. This gave the construction team a mere six weeks between receiving the building permit and the start of rehearsal. Adding to this seemingly impossible goal was the fact that at 9,200 feet in April, the weather is

unpredictable to say the least, and snow is quite common. Only the shell of the building was needed for rehearsal, along with electricity.

The construction team included contractors Doug Kirk and Russ Fignoca, electrician George Walck, log construction expert Dave Monchke, producer Barlough, Kitaro (it turns out that he is also skilled at carpentry!), Tibetan flutist Nawang Khechog, Fumiyo Nakanishi, engineer Damon Gold, photographer Jim McCrea and some local mountain folks. Design team members included myself, Mickey Houlihan of Wind Over the Earth, Bob Fritz of Fritz Engineering and David Kahn of Acoustic Dimensions. The crew became more of a family rather than a typical construction crew.

The studio is situated at the end of a very narrow, winding, mile-long mountain road. The huge gambrel trusses (14x16-foot) had to be very carefully brought in one at a time on a giant forklift. Four days prior to rehearsal, the roof was not yet closed in, and a large rain storm passed through. Eight people spent the day sweeping the water out of the studio. Fortunately, the crew had the "show must go on" attitude one

finds with touring road crews, and the six-week goal was met. Rehearsals took place in the new structure, as planned. After rehearsal, construction resumed.

THE STUDIO

The facility consists of a main studio, smaller studio, control room and machine room. The main studio is a beautiful 54x44-foot log structure with a 34-foot ceiling at the peak. A gambrel roof was incorporated into the design, as it allowed maximum volume while breaking up the large flat roof surfaces. The logs present a more diffusive surface than drywall. Curtains around the perimeter of the studio allow the absorption to be tailored to achieve a desired effect. Because the location never gets hot and the room has such a large volume of air, the normal air-conditioning systems required in most studios are not present. It does get cold however, so heating was needed. We implemented a system that pipes hot liquid through the slab floor; the room stays quite comfortable. Also, the Japanese tradition of taking your shoes off upon entering a building is practiced, making the heated floors a major benefit: your feet stay toasty.

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AN ENCHANTED EVENING

by Gary Barlough

After completing tour rehearsals in Kitaro's new studio, Kitaro and Eiichi Naito (president of Domo Music) decided they wanted to do a live CD and a concert film of the then upcoming "Mandala" tour.

To ensure that all the bugs were worked out before filming, we wanted to find a way to record many shows across the United States rather than just the night of the filming. We wanted to eliminate a costly recording truck and do the recording nightly as part of the process of the show. The instruments onstage would eventually fill 62 inputs and included everything from a drum kit and three taiko drums to didgeridoo, flutes, electric guitars, electric violin, giant gong and four timpani.

The Marin County, California, show was targeted to be the best venue for filming, and as our first show of the tour approached in Atlanta, we began to assemble the recording gear. I assembled eight DA-88s for this project. This would ensure 64-track recording and give us one extra machine in each of two racks for backup. Clair Bros. provided transformer-balanced splits to send us each line separately. No submixing would be required, even though there were 62 inputs.

The next and most critical step was getting signal to



tape. Michael Grace of Grace Design and Mickey Houlihan of Wind Over the Earth (both located in Boulder, Colorado) combined to build an 8-channel preamp that would sound as good as any preamp in our studio and be very cost-effective.

They went to work and by showtime had delivered eight prototypes of what is now the Grace 801. Assistant engineer Damon Gold assembled all the various connections and we were ready to sound check. The Grace preamps were stunning and, indeed, beat our most costly tube preamps in a blindfold test.

What proved to be a major step in the recording process was achieved by eliminating all but four monitors onstage. All performers went to an earphone system designed by monitor whiz Steve McCale except for Kitaro, who used Clair Bros. wedges. In the final recording, this step helped us create amazing separation.

Each night, Damon and I would check the tracks during soundcheck for any surprises. Steve McCale and house mixer Bob Jemigan were careful with their microphone selection and placement. Since the preamps lock in place and the ten performers were quite consistent with their output volumes, we rarely changed any levels once they were set. Before each show, we would hit record and I would play my parts onstage while Damon watched the levels. No audio monitoring of signal was needed after the first few nights, as the system worked perfectly. ■

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The control room is unusual in that it is L-shaped. All monitoring is done with reference monitors (Meyer HD-1s). Kitaro's keyboard equipment is located at the short end of the L. This equipment includes a 16-input Synclavier, several vintage analog pieces by Korg, Roland and Moog, and a Hammond organ. Much of the recording is done in 20-bit digital, directly into a 32-channel Sonic Solutions USP system.

Wind Over the Earth and Westwood Music supplied most of the equipment. A large array of outboard processing equipment is available in the control room. The machine room is the only air-conditioned space in the facility. It

houses ten Tascam DA-88s (see sidebar), videotape recorders, the Synclavier and Sonic Solutions racks and the console power supply.

THE WIRING

All inputs and outputs in the main studio come through four panels, one on each wall. A 2-foot-high log wall with a wooden lid goes around the perimeter of the studio, providing a nice place to sit, and the lid opens for easy access to all wiring. The electrical wiring is in conduit and is separated from all audio wires by at least one foot throughout the facility. Each wall in the studio has an audio panel with an ELCO connec-

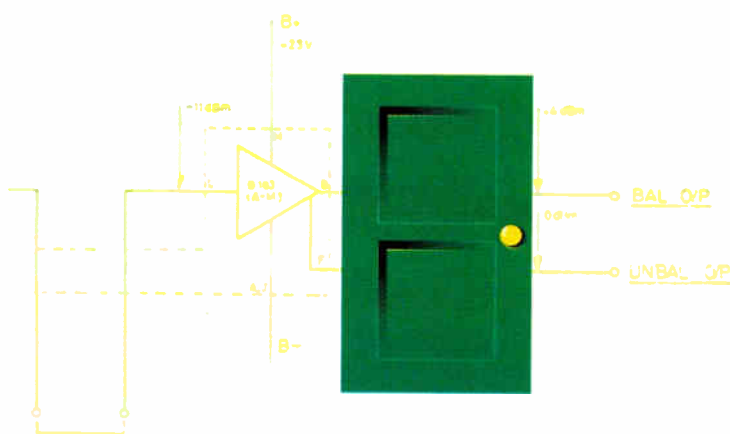
tor, along with two video and two MIDI connectors. Four "stage boxes," custom-made for the studio with 40-foot snakes, plug into the wall panels. Each stage box has 12 microphone, eight line, two cue, two MIDI and two video jacks. Grace Designs 801 mic preamps are located in the studio, allowing the signal to be sent to the control room at line level. An active MIDI extender system by JLCoooper is built into each stage box, with the other end of the electronics housed in the control room racks. This allows the MIDI signals from Kitaro's keyboard rack to be tied into equipment in the studio without length concerns. The studio also has ambient microphones, including AKG C-12VRs, high up in the trusses, along with room cameras. The small studio room has a similar stage box configuration.

Rather than fabricate the wiring in the studio, we decided to have the harnesses and patchbays manufactured remotely and shipped to us with both ends terminated. One end of the cable harnesses, which contained video, audio and MIDI cables, went to patchbays and the other went to ELCOs, BNCs, etc. Joe Wasser of North Springs Pro Audio built all of the panels, stage boxes, harnesses, patchbays, etc. to our specifications. Kitaro and I did our best job of carefully measuring a very circuitous and long route through the floors and walls. To be honest, I was a bit worried about whether measurements were sufficiently precise. But I knew that we could always relocate the panels if the cables did not reach. Then I went to the studio and discovered that Fumiyo, the carpenter, had cut the panel holes out of the logs where we had left the marks. It's pretty hard to "patch up" logs, so I went home and oiled up my cable stretcher. Fortunately, when the cable harnesses arrived and were installed, they were perfect! North Springs Pro Audio also provided patchbays and wire harnesses for the keyboard setup and machine room.

THE ELECTRICAL SYSTEM

We were fortunate to have an electrician (George Walck of EMF Electrical Corporation) who used to own a recording studio. He has provided the electrical systems for several studios that I have worked on over the last 17 years and truly understands the requirements. He knows about keeping his wires away from our wires and has a thorough knowledge of grounding. Because the studio would also be used for rehearsal, complete with the touring sys-

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World Radio History

ALESIS

tem (sans speaker stacks), he provided 400-amp service for temporary hookup. For the main studio, Walek added a subpanel and moved the existing control room circuits. Provisions were made for a 240-to-120-volt isolation transformer ahead of the new subpanel. This can also be wired for balanced 60V-60V-60V to ground power. All the new studio circuits are wired to the same common 120-volt bus in the new subpanel, so they are in effect on the same phase. All the studio wiring is installed in ferrous pipe (EMT) and steel flex to eliminate the electromagnetic flux from bleeding into the audio and video lines. Spacing is maintained as much as possible between power and audio lines. All outlets in the studio are hospital-grade isolated grounding-type, with a separate isolated ground and a bare dirty mechanical ground back to the subpanel.

At each wall is a four-conductor twist-lock receptacle with a 35-foot rubber sealtight plug that can be pulled out to the center of the studio. The rubber sealtight is computer-grade with a woven steel insert sleeve to eliminate electromagnetic flux, a phase and neutral conductor, and a bare dirty and isolated ground conductor. All the dirty

grounds bond back to the frame of the subpanel. All the isolated grounds run back to the lifted ground bars at the subpanel. This subpanel is then connected to a 500MCM copper cable, which connects to a buried ground plane consisting of 20 feet of bare 500MCM copper and a 3/4-by-4-inch-by-15-foot copper plate. This creates the star grounding path for all studio and control room equipment. The proof of the system was when Barlough proclaimed, "This is the quietest it's ever been."

The look and feel of a studio, along with room acoustics, are usually the first things one notices when entering a facility. The grounding scheme has an equally important, though much less glamorous, impact on the quality of the end product. For the overall ground scheme, the electrical, audio, data and video wiring were seen as one system. An important rule that had to be followed was that all equipment and cables had to have one and only one path to ground. Oversize ground wires were used throughout. It always amazes me how much difference a good grounding design makes to the noise floor of a facility. Many of Kitaro's vintage keyboards required special attention, but as

long as we had a plan and followed it, we were able to accommodate them.

The studio was a great success. Kitaro's vision was accomplished. Every musician who has worked in the studio loves it. It sounds great both in the room and on tape, and the taiko drums work very well in the room—their low end is supported with good definition across the full-frequency spectrum. The volume and proportions of the studio allow Kitaro the freedom to experiment and find the sound that he desires.

The feeling is very conducive to creativity; it also helps to be able to take a break and go catch an 18-inch trout or go canoeing between songs. The studio blends in with the natural surroundings in both look and feel. Nobody wants to leave. Creating a recording studio for a highly creative artist such as Kitaro requires that his vision and needs be translated into wood, concrete, wires and a lot of intangible items that create a particular "feeling." The success of the project is best expressed by Kitaro, as he frequently refers to the studio as "my dream." ■

Richard Zwiebel is a studio designer who also enjoys the Great Outdoors.

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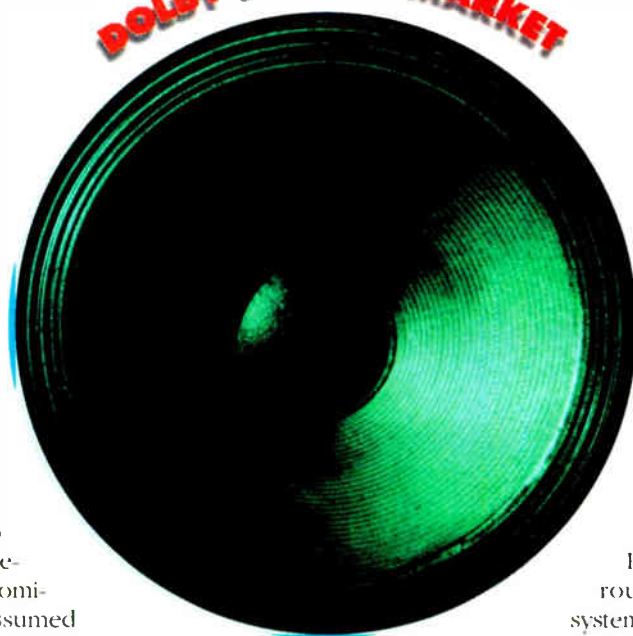
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MULTIMEDIA SURROUND

BY PHILIP DE LANCIE

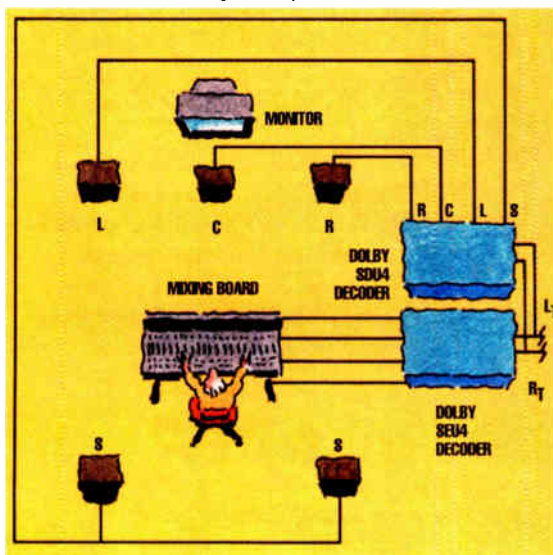
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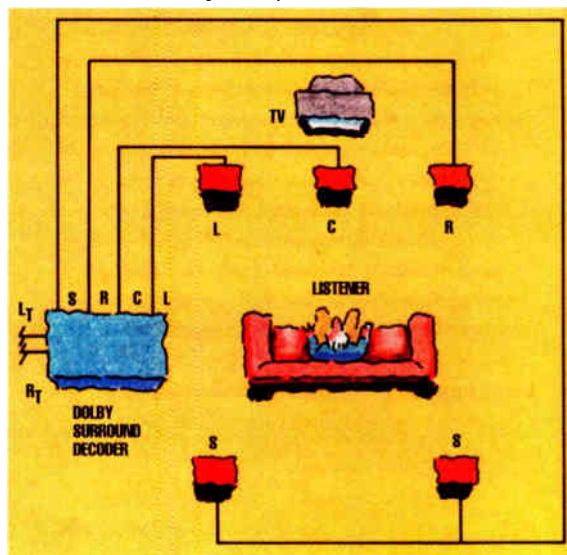
Few companies can match Dolby Laboratories when it comes to successful dissemination of technologies and standards. Indeed, in almost every area in which the company has brought its expertise to bear its products have become prominent, if not dominant. One might have assumed that the company would lately be in decline as digital media undermine the need for analog noise reduction systems, the field that made the Dolby name a household word. Instead, the company has been able to identify new opportuni-

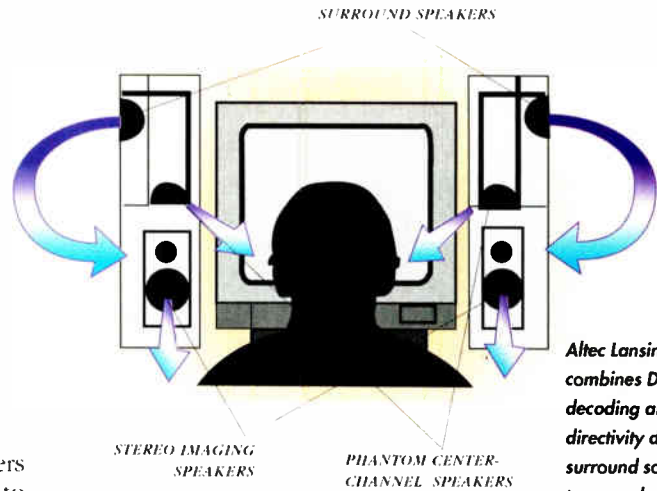
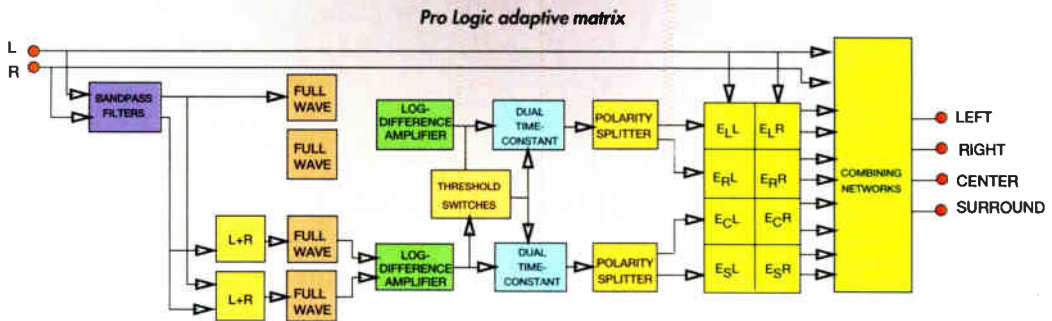
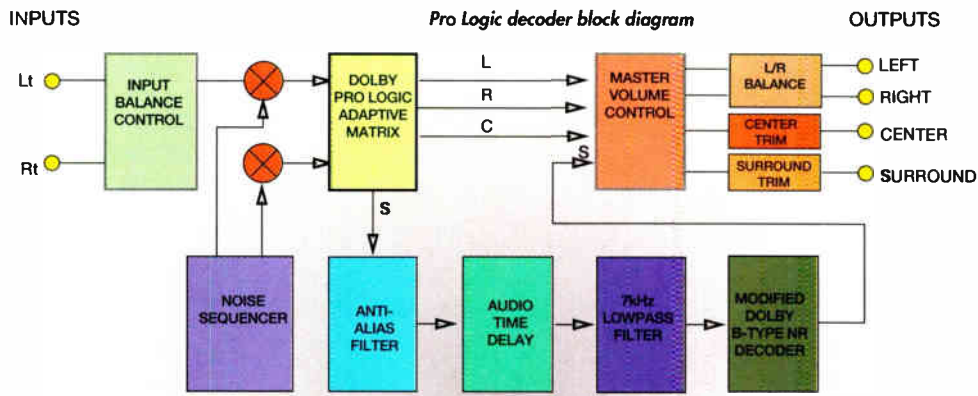
ties for its existing technologies and to develop new technologies to meet evolving market needs. One example of Dolby's success at this game is the booming demand for Dolby Pro Logic-equipped surround-sound home theater systems; another is the fact that Dolby's AC-3 multichannel digital audio encoding scheme (described in the October 1992 issue of *Mix*) was recently selected as the encoding format for audio accompanying NTSC video on the forthcoming SD high-density

Mixing in Dolby Surround



Listening in Dolby Surround at home





Altec Lansing's ACS50 combines Dolby Pro Logic decoding and controlled directivity design to provide surround sound for PC from two speaker modules.

digital video disc (DVD).

As a consumer format, stand-alone "set-top" DVD players are expected late this year from Toshiba and other major consumer electronics manufacturers, with DVD-ROM drives expected to follow soon thereafter. Decoding chips for MPEG 2 video and AC-3 audio may be included on controller cards for these new drives, but without a surround playback system, personal computer owners who purchase the drives will not be able to take full advantage of AC-3's multichannel capabilities (left/center/right in the front, left/right in the back and a sixth, bass-only track for subwoofers). That problem, along with the continuing emergence of the personal computer as an important home entertainment device, naturally led Dolby to consider how its surround technology might be applied in this new area. The company has apparently concluded that there exists a need for surround playback systems specifically tailored for the personal computer market.

From a business point of view, Dolby's interest in expanding the reach of its surround sound line is understandable. As a product category, home theater has proven to be fertile ground for the company's licensing efforts. Dolby claims a worldwide installed base of more than 20 million Dolby Surround-



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equipped consumer playback devices, including five million sold in 1995 alone, up 33% over 1994. The company says there are currently over 6,000 Dolby Surround programs available on video tape, laserdisc, CD, TV, radio, video games and CD-ROM.

In April, Dolby announced that it had signed a letter of intent with Microsoft pledging to "jointly develop technologies and specifications to support the use of Dolby Surround Pro Logic and Dolby Digital for PC and multimedia platforms." Dolby also announced that it is "working closely" with Intel to "bring a rich sound experience to volume PC platforms through software-only implementation of 'virtual surround sound' technology that is enabled both by Dolby's AC-3 and Dolby's Pro Logic matrix surround technology." Several other complementary efforts were announced as well, including use of the Motorola DSP56009 processor in surround decoding applications and the development by Dolby of a Dolby Surround encoding plug-in for Digidesign's Pro Tools environment. In addition to these initiatives, Dolby has developed a set of design specifications for manufacturers interested in making "Dolby Surround Multimedia" playback systems for the PC market.

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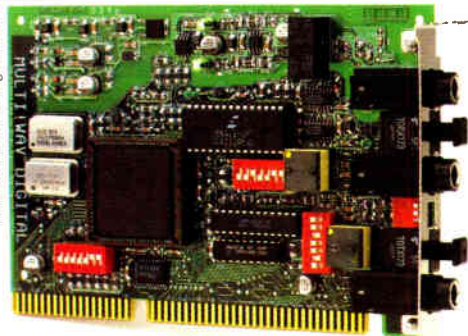
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DOLBY SURROUND TECHNOLOGY

The Dolby Surround product line is rooted in the Dolby Stereo system for movie theaters, in which a four-channel signal (left, center, right and surround) is encoded and stored in two-channel form, to be subsequently decoded to the original four channels upon playback. As VCRs and cable made their way into consumers' homes, the Dolby Stereo playback system was simplified and adapted for the nascent home theater market in the form of Dolby Surround, a passive system for the decoding of two-channel Dolby Surround signals into left, right and surround channels. Today, that earlier system, which compromised the surround effect, has been largely supplanted in the consumer arena by Dolby Pro Logic. According to Bill Barnes, manager of Dolby's Licensing Engineering department, "the Pro Logic decoder is functionally equivalent to the decoder in movie theaters. It is the correct way to decode a Dolby Surround movie or show."

Dolby Pro Logic uses "active signal steering" to derive four-channel playback from two encoded channels. "The Pro Logic circuit effectively steers the dominant sound into the appropriate output channel by canceling leakage

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- Rack mount option

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UltraMic™ padless preamp gives 60dB of gain range with 22dBu of headroom

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3 Auxiliaries configurable

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1 x Pre/2 x Pos

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Full 100mm fader

PH

STEREO INPUTS

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STUDIO RECORDING

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SUBMIXING

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into adjacent channels," says Barnes. "Our whole surround system overall is what we call a matrix encode and decode system. Any time you are working with two channels you really only have two parameters to work with, phase and amplitude. So the decoder looks at the two input channels, and it is constantly looking at relative amplitude and relative phase, and then making decisions based on that as to whether the dominant signal is a left-only signal, a right-only signal or a center signal. It actually involves a fairly complicated matrix of VCAs that are splitting the signal up into a whole bunch of different parts and taking the sums of signals and the differences of signals and feeding it through a whole matrix of gain-control VCAs.

"For example, if you have dialog in the center channel, and music playing in the left and right channels, the dialog will usually be mixed at a higher level so it is audible, and the decoder will look at that dialog as the dominant signal. It will see equal amplitude and phase in the two input channels, determine that the dialog is supposed to be center channel, and therefore cancel that signal out of the left and right, leaving the music in those channels. It is not perfect, but you can get over 30 dB of separation between channels."

The use of surround encoding raises a couple of issues of compatibility. Regarding the playback of non-encoded material through a surround system, Barnes says "If a soundtrack is not Dolby Surround encoded, you will still get a surround effect, just because of the way Dolby Surround works. It won't be controlled; it won't be what a producer has crafted or intended for you to hear, but you will get an effect." The playback of surround-encoded material without decoding has its own effect, he says. "If you just listen to the Dolby Surround mix in normal stereo, chances are you are not going to tell at all that it has been surround-encoded. But all the material that has been panned to the surround channel will end up out of phase in the encoded mix. For those particular signals there will not be a solid center. For people listening in stereo, that does produce a diffused effect on the imaging," which can be likened to the "wide" setting available on some boom boxes.

Recognizing the market appeal of surround sound and the benefits that digital technology could bring to it, Dolby developed the AC-3 coding scheme in the early 1990s. AC-3 is an

outgrowth of Dolby's AC-2 coding, a psychoacoustically based approach to coding in which knowledge of what humans can and cannot hear is used to minimize the bit-rate requirements of the resultant storage and transmission system. By coding 5.1 channels together (five full-range; one bass-only) and

Will the availability of movies on DVD in surround motivate computer consumers to pay for surround playback capability?

eliminating redundancies between tracks. AC-3 achieves even greater economy of per-channel data rate than AC-2, allowing high-fidelity multichannel sound with data streams as low as 325 kbits/second (excluding data redundancy for error correction).

AC-3's first commercial application was in movie theaters under the "SR•D" name (now called Dolby Digital), but Dolby's engineers recognized from the outset that for SR•D releases to work in the home video market provision would have to be made to ensure AC-3 playback compatibility on systems with fewer than six playback channels. "One of the inherent parts of the AC-3 code," Barnes explains, "is the ability to take that 5.1-channel soundtrack and have the AC-3 circuit 'down-mix' it to mono or stereo or even to a two-channel Dolby Surround-encoded soundtrack, so that it can then be played back through a Pro Logic decoder, or recorded on videotape and enjoyed in Pro Logic later."

SURROUND FOR PCs

The ability of AC-3 to deliver a usable signal to the input of a Pro Logic decoder is a crucial aspect of plans for Dolby Surround Multimedia because it

means that one common set of playback decoding specifications can be applied whether the source is a surround-encoded audio file resident on a conventional CD-ROM or an AC-3 bitstream from an SD or DVD-ROM. "The fundamental implementation of the Dolby Surround Multimedia playback system," Barnes says "is that there will be a left and right input, and whatever is being fed into the system will already be ready for that." From that starting point Dolby, based on design requirements prepared for licensees, envisions two different ways to achieve acceptable playback setups: "controlled speaker directivity" and "3-D sound processing."

Each of the two methods is simpler and less expensive than a full-blown home theater setup, mainly because, according to the design requirements, "the well-controlled, near-field seating arrangement offers unique opportunities to derive a credible surround experience without the use of rear-placed surround speakers." In addition, Dolby says that certain components of the typical Pro Logic decoding circuitry, including 7kHz lowpass filtering and modified Dolby B noise reduction (both on the surround channel), are not needed in the PC application.

The "controlled speaker directivity" setup involves a total of four speakers, two on either side of the computer screen. One speaker on each side, the main left and right speakers, would point toward the listener. The other pair, one wired out of phase with the other, would be aimed outward to the side. Pro Logic's Phantom Center mode would be used to eliminate the need for a center speaker. Altec Lansing's ACS500, which includes Dolby Pro Logic encoding, is one example of this kind of design, with front and surround speakers incorporated into one mini-tower for each side.

Perhaps more likely to appeal to a broad market is the "3-D sound processing" setup, which requires only two speakers to implement. This "virtual surround sound" technology is feasible, according to Dolby's design requirements, because 3-D sound processors "are generally able to work more successfully in the PC environment than in home stereo systems. This is because of the single-listener, near-field, controlled listening environment that the multimedia PC provides." Dolby's plan is to have licensees design systems that will reproduce the surround channel from a Pro Logic decoder through the main left and

right speakers. The company says such an approach can "produce acceptable results when [the audio] is first processed by an appropriate 3-D sound processor. Such processors typically make use of a head-related transfer function (HRTF) to create the illusion of sound originating from behind or to the sides of the listener."

"There has been an awful lot of progress made in the last five years or so on things like HRTF and that whole science of tricking the brain into thinking that sound is coming from where it's not," Barnes says. "It has really gotten to the point where it is very convincing. We have had companies asking us to allow them to do something like this for five or six years, and the technology was not to the point where we thought it was really credible, that it would really produce a good effect. Now they have perfected it, the processing power is there, the DSP chips are cheap enough, and the computers are getting more powerful all the time. So we think they can now produce a very good surround effect in a computer platform using 3-D processing."

Because the virtual surround sound approach would only require two final audio outputs, Dolby envisions that the entire Pro Logic and 3-D processing circuitry could be housed within the computer itself and make use of the computer's own stereo audio outputs. "Today, if someone wanted to sell a Pro Logic Multimedia decoder they would have to sell a sound card, because there is no commercially available executable Pro Logic decoder routine that you can run on a Pentium. All of the Pro Logic decoders on the market are either dedicated analog chips or dedicated DSP chips, like the Motorola 56009, that load Pro Logic code and run it. The code is not running on the computer's CPU, which is what companies like Intel and Microsoft envision." So instead of buying a card that has a dedicated DSP chip, Barnes says, "in the future you might get Dolby Surround by buying a software package, essentially part of the operating system, that recognizes a sound file as Dolby Surround and runs the decoding module."

Barnes has no information on when software-based decoding will become available. But he thinks the prospect is restraining sound card manufacturers. "Right now there has not been a whole lot of interest in doing sound cards," he says, "and I

think the reason for that is because it looks like the software solution is going to be much more attractive, and it is going to be here pretty quickly. What we have seen in the meantime is approaches like the Altec Lansing model where they put the processing in an outside box that can work with any sound card that can produce a stereo output."

PRODUCING FOR SURROUND

According to Barnes, Dolby expects the adoption of AC-3 as an audio format for DVD to be the "driving force" behind the incorporation of surround playback into the typical multimedia PC. But will watching movies from DVD in surround sound be an important enough motivation to make computer consumers—many of whom will buy DVD-ROM drives not for watching films but for other benefits such as greater capacity and faster throughput—pay for surround playback capability? That question won't be critical to movie studios; they won't have to alter their production procedures to accommodate the new format because they already prepare multichannel audio mixes for theatrical release. Multimedia producers, on the other hand, will have to decide whether the installed base of surround-capable machines is likely to grow large enough to make it worthwhile to use surround sound on their multimedia CD-ROMs. It is not a trivial decision, because delivering surround sound requires mixing in a surround-capable setup, which could involve a substantial departure from the typical audio-for-multimedia production process.

The production of Dolby Surround-encoded audio starts with a mix to four analog console output channels: left, center, right and surround. These four signals are fed into a Dolby Surround encoder (model SEU4). The left and right inputs each pass through the encoder unchanged to the respective "left-total" and "right-total" outputs. The center and surround inputs are each divided equally between the two outputs, with the surround input first undergoing additional processing, including a relative phase shift. Monitoring of the surround signal during the mix is accomplished by feeding the encoded "left-total" and "right-total" outputs into a model SDU4 decoder, which reproduces the original four channels. The left-total/right-total mix is distributed as if it were a normal stereo signal; in the case of a CD-ROM this would—for now—mean digitizing the signal

through an audio card to an AIFF or .WAV file. This fall Dolby plans to release a surround encoding/decoding plug-in for Digidesign Pro Tools to allow processing of already digitized audio files.

Adding to potential complications in the surround preparation process is the capability that Dolby devised with an eye toward dedicated video game systems and the PC market—of letting the end user interactively control the position of individual sound elements in the surround soundfield. "The playback hardware will be the same, if they already have a Dolby Surround Multimedia system," Barnes says. "But they will need a software driver that will know what to do to those sounds, how to handle them in response to input to produce the desired sound positioning."

Preparation of these interactive surround files, Barnes says, "is a relatively new thing. You have to mix a little bit differently. If you have things like music beds that you want to be stationary, you can encode them in the normal manner—put them in the center or the left or mixed into all four channels. That will give you your regular Dolby Surround encoded mix. Then in a separate pass you mix your dynamic sounds, such as a sound effect that you want to be able to control in response to some sort of user input. That has to be encoded in a modified manner and handled separately. You use a modified SEU4 encoder, switched into what we are currently calling "game" mode, and you run the dynamic elements through separately. The encoder will produce a two-channel output consisting of two components, which you store as a sound file.

"At playback," Barnes continues, "the control software, the driver, will take those two components, mix them together with the static sound and pan them forward, back, left or right. It is essentially assembling a two channel Dolby Surround encoded soundtrack on the fly." The question of how the various sound elements of this interactive mix are accessed from disc for simultaneous playback has not been worked out by Dolby. "There would have to be buffering," Barnes says, "but that is something that we are going to leave to the computer programmers to figure out how they want to do it. They are the experts." ■

Mix's media & mastering editor, Phil De Lancie, is a mastering engineer and multimedia designer for Fantasy Records in Berkeley, Calif.

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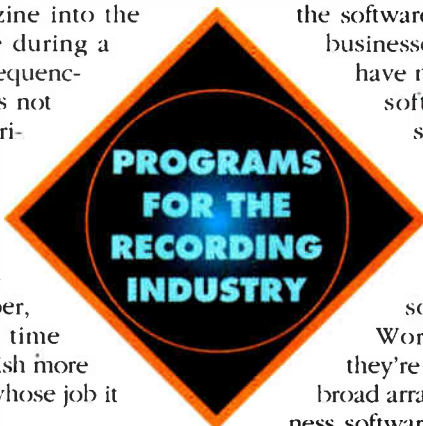
BY DAN DALEY

BUSINESS SOFTWARE

This is not a music software story. If you are an engineer who has taken this magazine into the bathroom or behind the console during a break to catch up on the latest in sequencing or sample storage software, it's not too late to grab other reading material. However, on your way, please leave this article on the desk of any or all of the following: the studio owner, manager, assistant manager, traffic manager, accountant, business manager, bookkeeper, or—perhaps more precisely at a time when studios are trying to accomplish more with less—the assistant engineer, whose job it is to do all of the above.

In a software-rich industry, with hundreds of applications designed to make the recording and editing of audio easier and more productive, studio

owners have been somewhat underwhelmed by the software developed to help them run their businesses. Until relatively recently, studios have made do using off-the-shelf business software solutions for accounting, scheduling, inventory and basic spreadsheet operations such as P&L reports. That's resulted in a business that, quite frankly, often doesn't pay enough attention to business. Some integrated software programs, such as Claris Works, are useful to a degree, but they're designed to appeal and apply to a broad array of businesses. The paucity of business software products for the recording industry puts the niche aspect of what we do into perspective (doctors' offices have dozens of specialized software titles to choose from) and at the same



E Ware's Studio Business Music Production Manager

File Edit Print Categories Window Help

Project Budget Expenses Reports AFM AFTRA Directory

Overscale

Instrument/Description: Last Name: First Name:

Leader/Contract. NY / LA Special Session Royalty Artist

Sessions: # Days: x Scale:

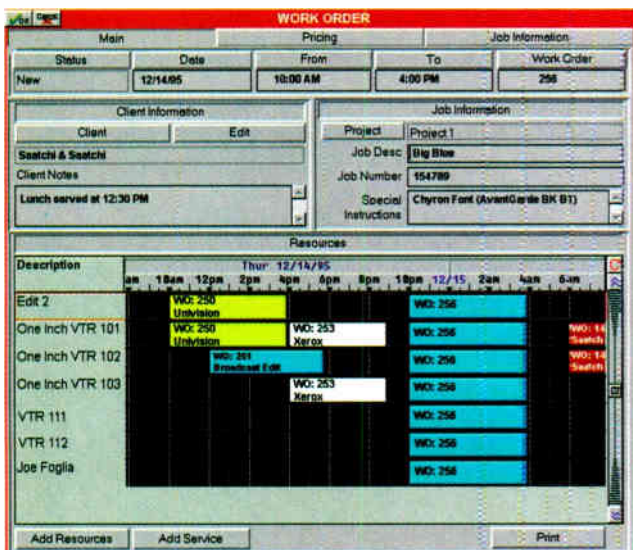
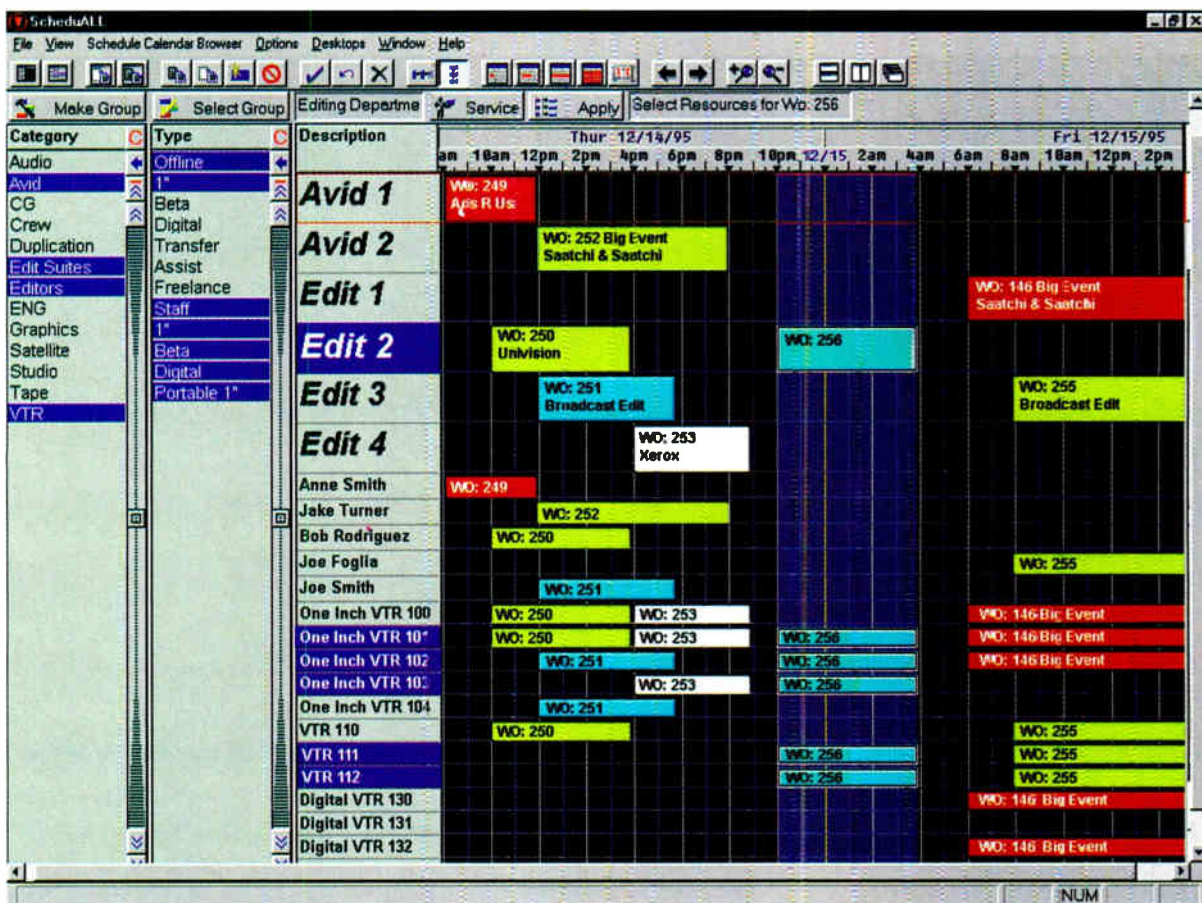
Doubling Cartage

Instrument/Desc	Name	Wages	EPW	H & W	Total
→ Drums	Hit Hard	\$2,658.10	\$265.81	\$135.00	\$3,058.91
→ Strings		\$13,822.12	\$1,382.21	\$702.00	\$15,906.33
→ Keyboards	Neil Larsen	\$1,329.05	\$132.91	\$75.00	\$1,536.96
→					

\$23,497.60 = Budget Total

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Musicians Total: \$23,497.60



Above: VizuAll Inc.'s ScheduAll; left: Archie's work order template

STUDIO BUSINESS

The newest and probably the most unique studio business software product is E Ware's (Nashville) Studio Business Music Production Manager. Not a studio management program per se, it addresses the needs of production budgeting, and with more and more recording studios adding in-house record companies, the need for and applicability of such a program become obvious. Creator John Leslie Hug, a producer with credits that include Marty Balin, The Busboys and Dwight Twilley, says he noticed a lack of software that allows producers and record companies to budget productions accurately. Hug says that Music Production Manager offers spreadsheet-like budgeting that can incorporate revisions at a keystroke, rendering it as creative as it is practical for record production in the '90s.

"Records are made with hopes and dreams that often outweigh the money available," Hug says. "This software at least helps make realizing those dreams more precise." But it also includes reams of functionality specific to the business of making records, such as complete American Federation of Musicians and AFTRA session reports (contracts), as well as talent benefit funding, including health and welfare payments. An overtime calculation allows producers to

time underscores the need for a more focused approach to handling day-to-day business matters in studios.

There are an increasing number of products that attempt to tackle the ironic problem of being software-poor in an industry that is increasingly based on computers. And they are starting to cover more bases. Here are a few.

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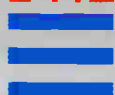


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compare the costs of an extra hour or two of overtime vs. two standard bookings with any number of musicians working at any number of rates. One interesting feature is the fact that union regulations are integral to the program; if you attempt to pay any musician quadruple scale, for instance, the program reminds you that triple scale is the legal maximum.

That attention to detail is what will make Music Production Manager attractive to record companies, Hug believes. (Elektra, Warner, PolyGram and Zomba are all using it to some degree, he says.) He has sold an expanded version of the software to several major labels, allowing them to distribute copies of the basic program under license to staff producers, whose budgeting data can then be fed back into a central accounting station. Individual versions of Music Production Manager retail for \$895; server-based versions will run between \$7,500 and \$30,000, with X-Ware of New York doing customization of larger programs (under a joint venture agreement) for record label users. Music Production Manager came out initially for the PC platform, but a Mac version was scheduled to debut in August.

The higher cost of the record com-

pany version is supported, according to Hug, by the fact that it is designed to handle far more complex situations than the solo producer version. For instance, the record company version will allow a label's management to monitor and control a recording "fund" that feeds multiple budgets in the case of projects with multiple producers and remixes. The management reports that the record company version can generate are more detailed, and Hug says he will customize the software for the particular needs of individual labels. Those who have taken him up on the enhanced label versions include Elektra Entertainment's and PolyGram Records' New York offices; Hug says he is on the verge of deals with Virgin and MCA in Los Angeles.

"If you want to make music using software, you're in good shape; if you want music business software, you have to look pretty hard and you still don't see much," says Hug of what motivated him. Programmer/musician Andy Zuckerman of San Francisco, who met Hug after sending him tapes of his band for consideration, did Music Production Manager's programming, reinforcing what Hug says is a program designed by and for professional audio users.

SCHEDUALL

VizuAll Inc. (Miami) has been offering its integrated ScheduALL software package for several years. Originally designed for television and post-production facilities, the program, which integrates resource-scheduling and management into a single package, has become more popular with recording studios over the last year or so, says sales director Dave Legow. "I was a scheduler in a post-production facility for six years, so I know firsthand how much redundancy of data input there is and how much time and energy that wastes," Legow explains. "Recording studios are under a tremendous amount of pressure right now; they're trying to get more productivity and profitability out of a facility using fewer people. So software solutions are the right answer."

ScheduALL takes the client-generated request or inquiry from the bid level through the final billing, including invoicing for work and materials, and updates the status of materials such as tape and boxes left in inventory. There's additional detail in the PC-based program's (no Mac version is yet available) capacity, though: It not only schedules but tracks projects (down to minutes, if required), stores and reminds you of

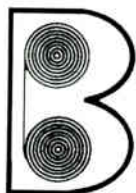
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equipment setups for specific clients, monitors time between scheduled maintenance, beeps you when rentals are required, manages personnel resources such as vacations and overtime and produces labels. It also has a bar-coding option, monitors accounts receivable, and creates estimates and stores pricing information for clients. In addition, it is designed to interface with existing accounting programs on an ASCII file interchange basis.

"Scheduling is the heart of the program," says Legow, "but the bigger part of the equation is management of resources—human and materials. And it lets you input all this data and use it in a lot of different ways for future projects, which seriously increases productive use of time." This comes at a price that's higher on average than most music software packages: ScheduALL starts at around \$3,600. With all the options for the equivalent of a three-room recording studio, including the billing option, the package would run about \$7,000.

VizuAll has no plans to modify the program for smaller facilities, although Legow says that even two-room studios and very busy multi-console personal studios can benefit from the basic package. It's designed to raise the level of

operations of the business side of an audio facility, a level that Legow says has historically been behind the curve of other types of businesses. "The studio business is one in which a lot of information has traditionally been written down on slips of paper," he says. "If one of those slips of paper falls behind a desk, a studio can lose \$2,000."

ARCHIE

Archie has gained a small but loyal following since its release in the early 1990s, with more than 100 users in the U.S. and more overseas. Written by software consultant and studio/record company owner John Alcock, it was originally distributed by San Jose software marketer Words & Deeds; it's now available directly from Alcock, who lives in Thousand Oaks, Calif. A Macintosh-based studio management program, Archie creates and handles client databases, accounts receivable, work orders and purchase orders, bookings and scheduling, tape inventory and archiving, equipment lists and depreciation. It can also classify clients in databases by type and by project, as well as generate quarterly P&L reports. It was designed, says its creator, for "computer illiterates," with single-keystroke opera-

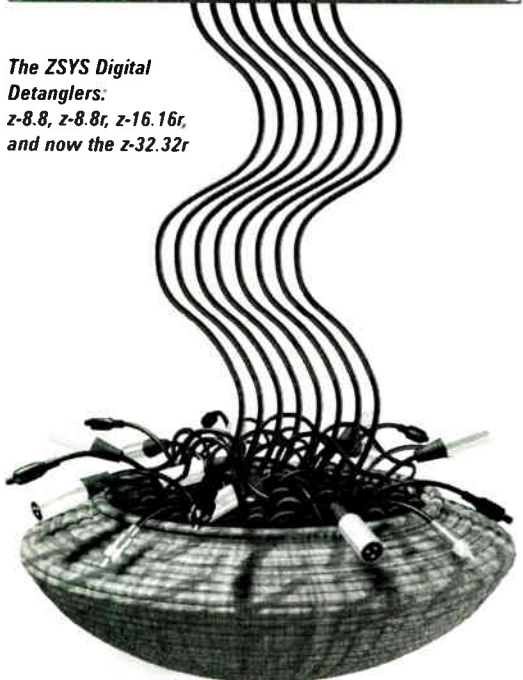
tions for everything from accessing databases to billings. Archie costs \$1,250 for the basic single-facility program, although it can include options to work on a server for multiroom facilities. Capitol Records studios in Los Angeles uses a heavily modified version of the program for its 12-room facility, and Alcock stresses that much of his business is predicated on modifying the basic program for specific facility applications.

Alcock says he saw a lot of interest generated in studio-specific business software programs around 1990, in the depths of the recession. An improved economy then led to a decline in interest—much, he says, to the detriment of small studios, which still have to try to increase profitability with smaller staffs in an increasingly competitive environment. "I've also seen more studios developing their own hybrid software, to meet their own particular needs," Alcock observes. "That tells me several things: that studios have become more computer-literate on the business side in recent years, that they are becoming more aware of the need for software solutions to business issues as well as for recording ones, and that hybrid solutions are sort of a stop-gap measure, at best.

"I've had a number of people come



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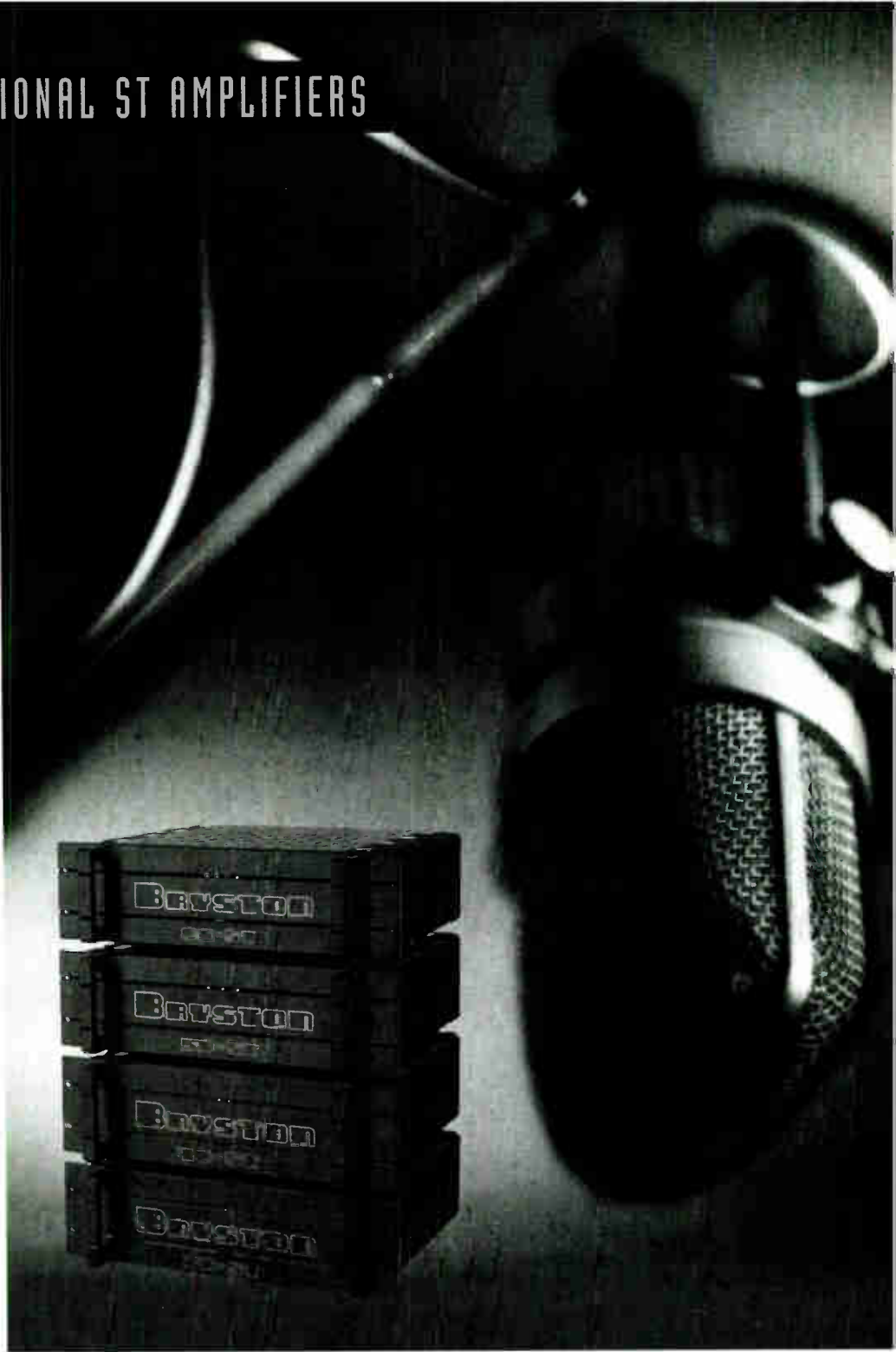


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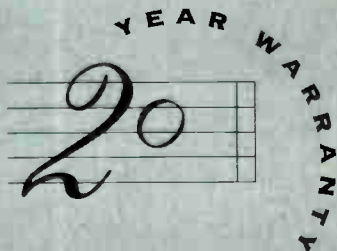


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to me recently saying that integrating several off-the-shelf programs to create one integrated system isn't as elegant a solution as it first seems," Alcock continues. And while he's taken a low-key approach to marketing the program, the growth of personal recording has sparked him to consider "Archie-Light," a project studio version that would offer pared-down functionality aimed at the owner-operator of a single-room facility. "The studio business in general has been kind of slow to follow the business software trend, but that's because there have been very few programs out there that address this business specifically," he says. "Studios are often run by ex-engineers or ex-musicians, and they're not going to get everything they need just by buying Quicken off the shelf. But hopefully that's changing. A program like Archie gives them a leg up."

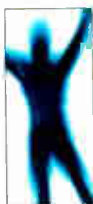
DO IT YOURSELF

Still, some studios prefer to develop their own software solutions. Four years ago, Richie Kessler, owner of Platinum Island Recording in Manhattan, did just that using the services of Brad Worrel, programmer and leader of punk band The Goops, and cartoonist/musician Mike Callahan. The two musicians integrated individual spreadsheet, database and scheduling programs, including Filemaker Pro and Quicken, to come up with a system that tracks the studio's bookings, client database and archiving. Functions include the ability to automatically withhold tape releases until either an invoice has been paid or a purchase order is issued by a record company. "The software we saw that was designed for studio management wasn't flexible enough for our taste," says Kessler. "I was able to get the kind of software I needed, and I was able to utilize the very creative musician elements in New York, many of whom do a lot more than just make music," says Kessler.

With business software aimed at specific niches like production budgeting, you can expect more programs designed specifically for recording studio functions to crop up in the next year or so. It will certainly not be a deluge. But as the awareness of and necessity for such capabilities grows, it appears inevitable that people will respond. Creatively. ■

Dan Daley is Mix's East Coast editor. He now realizes that running his former studio with an abacus was perhaps a mistake.

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BOB ROCK

THE NAME SAYS IT ALL

Bob Rock has worked with some of the biggest names in power rock, with engineering credits on albums by Bon Jovi and Aerosmith, and producer credits ranging from Joan Jett to David Lee Roth to Cher to, most recently, Metallica.

When *Mix* caught up with this Canadian native, he was finishing up nearly a year of tracking with Metallica in the newly renovated Studio A at The Plant in Sausalito, Calif. (see sidebar). He and his engineer, Randy Staub, were getting ready to head to New York with the band to mix the album at Right Track Studios. Rock took a few minutes out of one of the final sessions to discuss his background, influences and his views on producing powerful rock 'n' roll.

How did you get into the business?

I guess it was in about '76. I come from a musical background, basically. I was a guitar player in a band, wanting to be an artist, but it wasn't working out that way. I was from a small town called Victoria, in Canada. I moved over to Vancouver and took a recording course, from which I not so much learned how to record, but basically met some people in the business in Vancouver. And through that, one of the engineers—Roger Monk, who was at a studio there called Little Mountain—gave me a job as a runner, doing tape dubs, etc. I started there and worked myself up through Little Mountain from '76 until they closed about two years ago. I was engineering, mixing, doing local bands and Canadian bands with Bruce Fairbairn, another producer up there; I was his engineer. I did Loverboy, Bon Jovi, Aerosmith, etc., and then just after the Aerosmith album, I decided to produce instead of engineer. I started off with a project for Geffen—Blue Murder—and I ended up doing Kingdom Come, Motley



PHOTO: STEVE JENNINGS

Bob Rock in the Plant's Studio A

Crüe, The Cult and then Metallica. *How did you get involved with Metallica?*

They really liked the sound of the Motley Crüe album. They had actually approached me to mix the last album, and I didn't want to really do that, but I said I'd produce it. I guess they were taken aback by the fact that I would actually produce them; they came up to see me, and we talked, and we had the same view of what they had to do. I'd seen them on the *Justice* tour, and I was impressed with their sound live, in terms of how powerful they were. I didn't really hear that on the records. Some of their earlier stuff had a lot of power in it, but the *Justice* album wasn't quite as big and powerful as they were onstage, so that's why I said I could produce them.

Is that what they were looking for? A more powerful sound?

They wanted to improve the sound. They wanted to have a lot more power, and they wanted to get more melodic. So when we

talked about things, we talked about the approach of recording. Previous to my involvement with them, they had done a lot of work bit-by-bit, drums separate from guitars, etc. So I got them playing in one studio. They hadn't done that before, and they liked it. That was the *Black* album. This time, basically, it was the same thing, only they're from [the San Francisco Bay Area], so they wanted to record here, and they mentioned The Plant. They talked to Arne [Frager, The Plant's manager]; they were going to do some renovations, so at that point, I became involved in terms of the design, along with the engineer I work with, Randy Staub. And we came down, and we told them what we needed in terms of the room.

What kind of environment did you have in mind?

When we had done the previous Metallica album, we worked in a place in L.A. called One on One. It was quite a dead room, and we ended up taking all of the baffling out to make it a live-sounding room. We went in there because that's where they had done the

BY SARAH JONES

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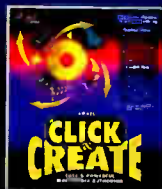
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PRODUCER'S DESK

Justice album, so they were comfortable there. And what we found is that when we livened it up and took everything out, and started from scratch, we basically had to bring back some of the acoustical treatment to cater it to what we were trying to get.

When they were talking about this room [at The Plant], Manny [LaCarrubba, technical director] and Arne had the idea of making a live room, so we told them to make it as live as they possibly could, because our theory was, we'll bring in different acoustic materials and surfaces and custom-contour the room to what we're looking for. So when they finished the room, we came up here about three months before we started the album and made suggestions like double-seal the doors, use different kind of materials on the walls, etc.—things we learned through our experience and through working at Little Mountain with a couple of technicians named John Vrtacic and Ron Obvious. Ron just built Bryan Adams' studio in Vancouver and [Bruce Fairbairn's studio] The Armoury.

So we brought them into this place, and the isos became a lot better—they became bigger, they had a lot more isolation in them. And in the big room, we started with the drum kit and spent about two weeks bringing in different baffles, different materials, and we basically contoured the room to the decay and to the sound that we were looking for. Manny designed a system where baffles would just hang on the walls, and we could just flip them over for hard surfaces, etc. The harder surfaces would bring out a lot more highs and more wash in the room, and the deader ones would soak up the bottom. Most of the wall area is stucco in there, which is quite a hard, reflective surface, so we got them to lacquer plywood, which really gives the room a warmth. And we just brought tons of sheets of plywood in, and we would take out two or four, and you could really hear the difference. I think anybody that comes into the room is going to be impressed with how much you can customize the space. Rather than using reverbs and all sorts of gear, you can really get a great sound from the natural instrument.

It's tweaked kind of nicely now, just in time to leave. And we're really just moving for the console size, more than anything. So we're going to Right Track in New York, and we're going to mix on the new SSL 9000.

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—FROM PAGE 80, THE PLANT

insisted that we have an unobstructed view,” explains LaCarrubba. “Previously there were supports coming up through the window, dividing it into three sections. To have that unobstructed view, yet maintain the rigidity we needed to keep the low end tight, meant that we had to have some rather sophisticated steel work to form the front wall. It’s a span of almost 15 feet, with compound mitered joints in the glass.” The isolation between the control room and studio ended up at 60 dB.

All wiring was laid out by LaCarrubba and Plant tech Jack Dubowsky, who put together an in-house wiring crew. “The original room was a relatively standard configuration, with rows of outboard gear permanently mounted in front of a producer’s desk, raised on a platform behind the console,” LaCarrubba explains. The crew leveled the floor and installed new LaCarrubba-designed and Omnix-built outboard racks. The racks roll into various configurations and lock together with a tabletop that fits over them to form a counter if desired. The monitors are customized TAD component systems, also designed by LaCarrubba, with some newly installed power amps. A Studer A800 24-track machine was added to the new room.

The work was finished in February of 1995. “We built a building inside the building, a new front wall for the control room, new machine room, three iso booths, installed two new air-conditioning systems—all in about 90 days,” says LaCarrubba. “Then Bob [Rock] came in with Randy [engineer Randy Staub], and they did a test setup before they started the project in earnest. They had a request for us to make some alterations in the iso booth and the machine room adjacent to it. And that took about another ten days.” Metallica began tracking the new album *Load* in March of '95, and really put the new studio through its paces.

—Sarah Jones

PRODUCER'S DESK

Describe your own studio.

I just built a studio in my house in Maui; John Vrtacic is designing it. I bought the consoles at Little Mountain; I bought the old Neves that I had learned on, and now I have them all in modular boxes. Right now, I have 40 inputs of Neve modules. So that's my portable studio, and I have the same setup that Bryan Adams has, which is a 56-input Mackie console. I use that for monitoring. And it's all prewired in a patchbay, so I have a complete modular studio. And that's what I'm going to use until my control room is built. I'm building a mix room in the house, and I'm going to put an SSL in there, a new 9000.

What about monitors?

I pretty much use NS-10s, and I use little ARs at home or in a hotel room, wherever I'm working. But generally I use whatever's handy. I like the NS-10s because I've been using them for so long I know what they sound like; I'm used to them. Sometimes they don't sound all that great, but it's a question of what you're used to. We went to KRKs for a while, and they were very close, they were a lot better to listen to—you could listen to them longer, louder, etc.—but things were just missing. I started adapting what I was doing just so I could use the KRKs. So I went back to the NS-10s for a mix and it was easy, and it sounded better. I still actually use Auratones, I went back to them about three or four years ago. There's something about them...they're so boxy and so mid-y. They're great for hearing vocal, pitch, all sorts of stuff that you don't hear on better-sounding speakers, even the NS-10s. And I know a lot of people like even more transparent speakers. For myself, the balance is NS-10s. We use a little bit of a Yamaha subwoofer, just to give them a little bit more bass, because we just kept blowing woofers every day. We had a lot of bottom on this album.

Do you find that you produce more from a musician's perspective, or from an engineer's?

Project to project, it varies. Being a musician and learning, working with other producers for many years, and engineers, I value that sometimes the engineering, technical end can get in the way of the music. And by the same token, coming from an engineering background, I have my version of audio, what I like to hear. So it's always a balance, but I pretty much go with what the band wants to do. One of the reasons I made the switch to producer

is because I was always interpreting as an engineer what somebody else was hearing. I pretty much had to stick to what they wanted to do even if I didn't agree with them. Becoming a producer enabled me to be a lot more creative.

My main rule is that there are no rules. There are people that can go out and mike a whole band and bring up the faders, and it's pretty much there. That's actually the way I learned, doing jingles and commercials. Up in Canada, I worked with very English-style engineers, and we worked on an old Neve, and they could pretty much set the whole console, all the levels—that's how I learned. But, I quickly learned, they used to use condensers on everything. Well, I brought in a Shure. The studio didn't even own one! And that opened that up. So I'm always the guy that doesn't like the rules.

What would you say is your production philosophy?

Ultimately, the performance is the most important thing. By the same token, many a performance is lost in crappy audio. So like I say, it's a balance. You don't ever want the technical end of it to get in the way of the performance, but you still want things to be present and have character. It's a balance. It's much like the digital and analog argument that still goes on: I still cut my drums and guitar on analog, but bass and vocals I do on digital. And it's mainly pretty much for vocals, the comping, the lack of hiss, being able to use a vintage mic and actually hear the vintage mic when you play it back. But I also like the sound of drums on analog. I know what I like, so I tend to use equipment that way.

It's pretty much the same philosophy, in terms of making a record. It's funny, every artist looks at a producer's career and thinks, 'Oh, I want that producer's sound.' For example, I have people that want to sound like Metallica. Well, I can give them the same approach to audio, but it's not going to make them sound like Metallica. They're not going to have the power, or they may have a different thing about them. My approach is to use whatever I know to get what they want. A lot of engineers and producers collect microphones; well, I do that, but I also collect musical instruments. I have a warehouse full of keyboards, guitars, drums, etc. I try and get the sound from the source, in most cases. You learn that over the years, too: It's not the EQ or the effect, it's the actual instrument. ■



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THE ROY HARGROVE QUINTET

LIVE AT THE JAZZ FESTIVAL PLAZA '96 IN HAVANA, CUBA

The Roy Hargrove Quintet landed in Cuba on a soothingly warm Monday morning to join Havana's Jazz Festival Plaza '96. The festival is organized by legendary Cuban pianist Chucho Valdés, who currently heads a jazz/salsa ensemble called Irakere. The festival has taken place every February for the past 16 years, but because of the political isolation of Cuba, the festival's delights have gone largely unnoticed outside of a limited group of South American, Cuban expatriate and Canadian jazz artists.

My invitation came only weeks before from Hargrove's manager and producer, Larry Clothier, who sensed the possibility of some unique recording opportunities. The quintet features Hargrove on



Above: At the Casa de Musica Roy Hargrove (trumpet) and other members of his Quintet jam with members of Irakere and Anga (congas). Left: Hargrove and the recording setup.



trumpet and flugelhorn, Ron Blake on tenor saxophone, Charles Craig at the piano, Gerald Cannon on bass and Karriem Riggins at the drums. This article is a diary of our Cuban excursion.

TEATRO NACIONAL TUESDAY, FEBRUARY 13

One of our translators, Carlos Johnson, pointed out the Teatro Nacional as we passed it on the way from Jose Marti Airport to our hotel. On the same plaza as the

Teatro Nacional is the Ministry of the Interior building, which features a nine-story wrought-iron portrait of Che Guevara.

The interior of Teatro Nacional seems about twice the size of its exterior. It seats about 3,000 on two levels, and the enormous stage has wings as large as tennis courts. Comfortable but dusty red velour seats blanket the room. Ceiling acoustic treatments appear to be

more decorative than absorptive and, even when the room is filled to capacity, do not smooth out the reflections caused by the smooth plaster walls and ceiling. The trucked-in P.A. featured ancient-looking, light gray, double-15 two-way JBL cabinets without grilles. These were stacked three abreast—on a flat vertical plane—and two high, on either side of the stage. Amplification came from a rack of four Peavey 800 Series amps positioned in front of the stage, facing the house's main aisle. The house console was an early Peavey 32-input, and the 24-channel monitor board was from a manufacturer unfamiliar to us, LEM. Monitor speakers were mostly Peavey wedges, with a couple of JBLs, again powered by Peavey amps.

I took a big gulp and began negotiating with the house and festival engineers about splitting and where I could set up separate microphones. Few engineers I met in

BY ADAM BLACKBURN

—CONTINUED ON PAGE 88

BETA SOUND RECORDERS

Edmonton, Alberta

A lot of audio post work is done in Canada, and it may surprise some that many of the projects are being done in Edmonton, Alberta. One facility that's contributed to the increasing activity in this region is Beta Sound Recorders, a two-room music/post house that has been gradually upgraded over the past several years.

Beta was started in 1988 by musician/composer/engineer Gary Koliger, who previously made his living as a session player. He purchased an existing one-room studio, the former Sundown Sound, and began recording indie CDs for himself and others in what is now the facility's Studio 1. At first, he was using the gear that came with the place: an MCI 428 board and an MCI JH 16/24 2-inch tape machine. "Studio 1 had actually been the first 24-track studio in western Canada," says Koliger. "And there used to be big bulkheads in the back corners. It was originally built in '75 to be a quadrasonic recording place, back when quad was happening. There were these huge JBL monitors. Long before I [purchased the studio], I was a session player, and I'd come in, and boy, the SPL levels you could get in that room were unbelievable."

Koliger removed the rear quad speakers from the room, but the major changes began when he was joined a couple of years later by veteran producer/engineer Doug McCann, who had worked for years in Vancouver's booming music and post community. McCann, who now co-owns the studio with Koliger, is also an experienced studio builder, and he and Koliger designed and converted a large area adjacent to Studio 1 into what is now the facility's dedicated post-production room, Studio 2. Studio 2 contains a Sony/MCI 636 console, a Fostex Foundation, DA-88s and Genelec 1030 monitoring.



Control rooms 2 (above) and 1



The owners have also gradually upgraded the look and equipment in Studio 1, which now offers a 72-input Amek Big console with Total Recall, an array of outboard gear and tube mics, and Genelec 1032 monitoring. "We've got JBL 4430s in the soffits," says Koliger, "but we never turn them on unless we're doing a really loud guitar track. For us, the Genelecs are it." The facility also has a selection of reference monitors from Yamaha, Tannoy and Auratone that can be used in either room. "In the last two years, we've put a quarter of a million bucks into this place," Koliger says, "just in upgrading all the fixtures, the infrastructure, the new carpets, the nice-looking walls, the track lights. And that's not to mention all the gear that we bought.

"But it's not enough just to have the gear," he continues, "because in

the past, a lot of film and video producers, locally and regionally, had to go either to Vancouver or Toronto to do their audio mixing, and they no longer have to. We're in the process of letting them know that they don't have to, but it's a hard job, because when there's a perception out there, it takes awhile to change it. So we don't just have to have the gear and the people to do the job; it's having the ability and gear, and having them come in the door, and then having them feel that they've made the right choice. It's like the essence of sales is not selling somebody your fish; it's selling them the great feeling that they get from deciding to buy the fish from you."

Beta has apparently been making its case quite successfully so far. The studio's credits include post work on television programs such as *The X Files*, *Lonesome Dove*, *Kung Fu—The Legend Continues*, *Due South* and on ads for the Edmonton Oilers and the Alberta Motor Association. Recent music projects include recordings for Long John Baldry, Peter McCann, and Verlon Thompson with

BY BARBARA SCHULTZ

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INTERNATIONAL UPDATE

Suzi Ragsdale. And the facility does ongoing mixing work for Karvonen Films, North America's second-largest producer of nature films (after National Geographic).

McCann, the studio's production supervisor, still does a lot of the engineering work that comes into Beta, but

Koliger's work as general manager keeps him too busy with clients, banks, etc., for him to jump behind the board. "All I ever engineer now is my own stuff," he says, "which I mainly have to do at night. I have to stay out so the people can get their work done."

Visit Beta Sound Recorders' Web page at comsept.ab.ca/betasound/index.html ■

"ZERO GRAVITY"

SURFIN' FINLAND

Zero Gravity is the latest release from Laika and the Cosmonauts, a band you may not have heard of unless you listen to college radio, or unless you make it your business to search out Scandinavian surf guitar. These guys are from Finland, and they sound like a slightly futuristic version of Dick Dale and the Deltones. The new CD, on Rounder's Upstart label, includes the material that made up the band's first two albums: *C'mon Do the Laika* and *Surfs You Right*, which until this year were only available in the Cosmonauts' native country. Highlights include the rockin' title track from *C'Mon Do the Laika* and a smashing version of Dizzy Gillespie's "A Night in Tunisia."

This unusual band's early recordings were made on a shoestring. "Neither one of those records was made in a studio at all," says drummer Janne Haavisto. "We recorded the first one, *C'mon Do the Laika*, in a rehearsal room that we had at the time. It was a big basement with a huge echo." The band did their own production and recording on a Teac 4-track machine; they also had a Teac 2A board and some borrowed mics. "The best mics we had were Shure SM57s," recalls bassist Tom Nyman. "We used them on the guitars, but I don't remember what the others were. I think we had a bass drum mic and one overhead, and then we had one mic for each amp and one mic for the room. Drums, bass and the ambience mics were all put to one channel, and one guitar to one channel, and the other one to another, and we even had one more channel to put overdubs." The record was mixed in Haavisto's one-room apartment on a Teac 2A board with tape echo and a Roland DEP5.



Haavisto says the monitors were a makeshift concoction by his brother-in-law.

Surfs You Right was cut in a wooden house near Helsinki using a Fostex R-8 8-track machine, a 12-channel Fostex console and some more borrowed mics. The band, again, did all of their own engineering and production, mixing at a small radio commercial-production studio called Soundart. Today, the band records in their own studio, a four-room loft next door to Finnvox Studios, where the early material was remastered for U.S. release. These days, they record to a '70s Studer A80 2-inch, 24-track machine that the maintenance engineer from Finnvox restored. They also have a Mackie 8-bus console and Genelec 1031A monitors. "The first album was with a 4-track," Nyman says. "The second one with an 8-track, the third one with 16 tracks, and I think the fourth was with a 16- and a 24-track, so the next should be...well, you figure it out."

At press time, the Cosmonauts were shopping for a producer to work on a new release that they'll begin recording this fall, and they were getting ready for a 15-gig U.S. tour opening for Ministry(!) this spring, during which they will also play ten of their own dates in smaller clubs. If Laika and the Cosmonauts land in your town, walk, don't run to check out Finnish surf music at its finest.

—Barbara Schultz

"Amazing"

— Bob James

"Phenomenal"

— Jon Anderson

"Remarkable"

— Don Murray

"Blew me away"

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INTERNATIONAL UPDATE

—FROM PAGE 84, ROY HARGROVE QUINTET
Cuba seemed to have the passionate zeal (read “propeller-headedness”) of North American engineers I’ve met. I later learned that most were state employees, meaning that they are paid in Cuban pesos. At the current exchange rate of 25 pesos to the dollar, items such as fresh produce, cooking oil and soap—available on the dollar-only black market—are practically out of reach. That might make any person’s job frustrating.

Using signal-flow diagrams and obscure-looking hand gestures, the house engineers and I managed to reach an agreement on signal splitting. Only the two horn mics would be shared, while separately placed mics would account for the balance of house and recording inputs. We had attended a show at this theater the night before, and I feared that the howling buzz we’d heard from the main speakers was always there. Upon listening to my solo’d channels during the soundcheck, these fears were confirmed. On the channels we split—Hargrove’s trumpet and Blake’s sax—the buzz was loud and clear. With 15 minutes left before the scheduled show time—in “island time,” about an hour before the show would actually start—I still couldn’t convince the engineers in my flailing “Spanglish” that the problem was worth chasing down. I took a pair of ATM-35s originally to be used as room mics and taped them onto the horn mic stands.

Our 16-track DA-88 system performed flawlessly. I had to format both the master and slave reels simultaneously while recording, but the tapes locked effortlessly in playback. I used the Mackie CR-1604 mic preamps and sent the signal to tape from the direct outs, the six aux sends and the alternate 3/4 stereo bus, using 16 tracks on the DA-88s. In order to make a rough stereo mix on the spot, I used the MS 1202 to mix the tape returns, with one of the stereo aux returns used to return reverb from a Sony HR-MP5. The MP5 is a half-rack unit, but it includes some large-sounding effects, including the orchestral hall algorithm used to approximate the Teatro Nacional.

The only serious problems were on-stage. First, an ornery new Steinway D grand detuned itself 20 minutes into the set. Then, during his bass solo, Cannon inadvertently clobbered the ATM-35 in the bridge of his bass, sending it flying into his monitor speaker. Pianist Charles

Craig drew cheers from the crowd and a stunned gape from me when he dove from his bench and crawled under the piano, reattached the microphone and scooted back to his keys in time for the opening bars of the Hargrove-penned groove, “Roy Allen.” I quietly resolved to find a better place for the bass mic.

SALON INTERNACIONAL, HOTEL HABANA RIVIERA WEDNESDAY, FEBRUARY 14

The gangster-haunted, faded Jetsons-style glitz of the Riviera Hotel was the epicenter of Jazz Festival Plaza ’96. Its Bar Elegante and Salon Internacional were sites of evening and late-night shows each day, with jam sessions in the bar winding down close to 5:00 a.m. or 6:00 a.m. With its Alexander Calder-meets-Salvador Dali-in-Metropolis chandeliers, the huge oval room’s suspended ceiling is the hands-down winner of the hemisphere’s Most Bizarre Acoustical Treatment.

The Roy Hargrove Quintet would perform first. The second band would be Grupo Klimax, an 11-piece, wildly talented salsa band from Cuba. They were to be followed by Sintesis, an eight-piece Afro-Cuban jazz-pop ensemble of Cuban and Puerto Rican musicians. During soundcheck, Grupo Klimax’s FOH engineer couldn’t track down the house technicians, who were needed to point out AC outlets. Although the technicians never did arrive, we finally located AC at about 3:00 p.m., and Klimax’s engineer began a grueling soundcheck. The drop-ceiling—rather like a bowl hanging upside down inside of a larger bowl—acted as a transmission tube with a four-second delay; a snare drum, delicately brushed on one side of the room could be heard clear as a bell emanating from the gap between the wall and the ceiling on the opposite side of the room. Larry Clothier and I agreed that we would favor minimal sound reinforcement.

The SR rig for the Habana Riviera was the same one we had seen the night before at the Teatro Nacional, with some variations. The house and monitor consoles were now older Soundcraft 24-input desks, and amplification came from Crown Macro-Tech units. The mic collection was much the same—a variety of ’70s Shures, all showing their age.

Hargrove’s set went smoothly and produced among the best-sounding tracks from the entire trip. Again, not all the mics were split, in part because of the general pointlessness of ampli-

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fication. The recorders and house shared only the horns, electric piano, timbale and conga mics. The only bass amplification was from an on-stage amp fed by a direct box, which was not recorded. We found that having any bass in the P.A. resulted in a low-frequency deluge that no amount of EQ could diminish.

The band was joined for two tunes by Fluerine Verloop, a talented young Dutch vocalist, before launching into "The Public Eye," a 23-minute guest-artist jazz orgy that included legendary Cuban musicians Chucho Valdes (piano), Changuito (timbales) and Anga (congas). Young Cuban trumpet maestro Indio joined Hargrove in mid-tune to trade speeding, climactic solos and a call-and-response of machine-gun riffs. Following a relaxed changeover,

we enjoyed Grupo Klimax's set and decided to check out Sintesis, the last ensemble of the evening to play. Sintesis' engineer was Ernesto Hernandez, a softspoken gentleman who became a good friend. Hernandez agreed with Clothier and me that this room was truly a bear. But he had a far more daunting task, as Sintesis are, save for percussion, a largely electronic group.

UNEAC THURSDAY, FEBRUARY 15


UNEAC is the Writer's Union, a meeting space for novelists and other literary types, housed in one of the spectacular old mansions of Havana. Although most of these huge villas are now crumbling homes for five or six families, some have been partially or fully re-

BITS & PIECES

Studio Funk, which has facilities in Hamburg and Berlin, recently opened a post-production complex in Dusseldorf. The studio is equipped with a DAR SoundStation Gold console...The Factory (Vancouver, B.C.) recently hosted sessions for Ferron's Warner Bros. release *Still Riot*. Studio owner John MacLean engineered the recordings with Sheldon Zaharko assisting. MacLean, who used both a Studer 16-track and an Otari MTR-90 24-track machine, says he also employed a lot of tube preamps and "old-school miking" on the sessions, which he calls "spiritual"...Livingston Studios (London) hosted sessions for a new release by London Records artist Mike Flowers Pogs. The singer, whose easy-listenin' cover of Oasis' "Wonderwall" received notoriety in the UK, is recording an album of covers. Mark Chamberlain engineered; the producer is Mike Roberts...Solid State Logic opened a new Asian office, located at 447A Macpherson Rd., Singapore 368157. The office is headed by Chan Kheng Wah, who was director of Studer Revox in Singapore for 14 years. SSL also reports recent console sales to Bulgarian National Radio, Amsterdam's Artisound Studios and the Parisian Radio Network...AR is a new music-recording studio in Brazil. The facility, de-


signed by the Walters-Storyk Design Group, features a restored 60-input Neve V-3 console, two Otari MTR-90 multitracks and Genelec main monitors in its Studio A. Studio B is equipped with a Mackie 32-input board and Pro Tools...The legendary Olympic Studios (London) was the recipient of *Music Week's* award for Best Studio of 1995. Recent clients at Olympic include Tina Turner, U2, Bjork and Madonna...Hullabaloo Studios is a new post-production facility in Manchester, UK. Situated in the Cosgrove Hall Films complex, the studio specializes in track laying, sound effects design and autoconforming. This facility is equipped with the first Amek Digital Mixing System and an Avid Audiovision workstation...Shepperton Studios, Saunders & Gordon, Taran Studios and Twickenham Studios are among the UK facilities that have recently purchased Harrison consoles...London's School of Audio Engineering has begun offering a dedicated three-month course for aspiring DJs. The program will cover studio maintenance, basic mixing, fading and megamixing, as well as communications skills. ■

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stored to their original colonial glory. UNEAC is one of the latter.

This evening's show fit in as a sort of a "second stage" to the main venues of the jazz festival, but it happened to feature two of the festival's prime attractions: Hargrove's Quintet and Grupo Perspectiva, a fusion outfit headed by bassist Jorge Reyes, formerly of Cuban expatriate and trumpet legend Arturo Sandoval's band. It was a beautiful evening, and the UNEAC estate provided a fitting backdrop. The band played on the mansion's veranda overlooking a semicircular patio in one of the gar-

dens, where the audience was seated under a sextet of palms.

Although we had originally intended to record only the larger-venue shows, interest in the historic nature of the whole festival made us want to preserve it all. We did, however, decide that not every show needed to be captured with the bulky 16-track rig. So, a miniature live-to-DAT subset was assembled: two microphones only—the SASS stereo PZM for the ensemble and an ATM-35 on the bass bridge—and a mono DI for the electric piano were mixed on the Mackie MS 1202 and recorded via the Symetrix A-to-D converter onto my portable DAT. The SASS

sat atop my 15-inch telescopic mic stand—a holdover from my salad days as a Grateful Dead taper—at the edge of the steps up to the veranda. This placement was ideal because it did not interfere with either the seating arrangement or the view of the stage; in addition, the foot of the stairs was about seven feet from the front of the band, giving the SASS mic, roughly at eye-level with the horn players, a nice blend of all the acoustic instruments and onstage amps.

We were granted a special treat by Jorge Reyes and Perspectiva, who allowed us to record their set following Hargrove's. Their set was fantastic, augmented by the presence of Hargrove's tenor player Ron Blake, who added Latin-tinged saxophone to a good half of the set.

**FORMER UNITED STATES
AMBASSADOR'S RESIDENCE
FRIDAY, FEBRUARY 16**

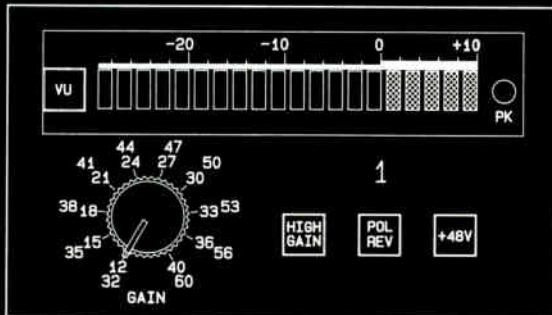
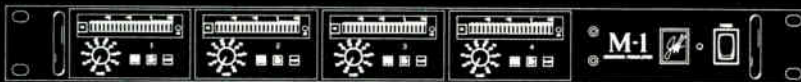
Our invitation to play at the former U.S. Ambassador's residence typified much of the vibe we felt during our stay in Cuba: two nations, formally not speaking to each other, still could find ways to share their art and communicate in human terms. [Editor's note: *The festival took place just weeks before the American plane was shot down in disputed Cuban airspace, prompting a cultural and economic embargo of the island.*] There is no official U.S. embassy in Havana; rather, there is an organization called the American Interests Section. We had been invited to a reception there, honoring Cuba's most respected jazz musicians and marking the international significance of the Jazz Festival Plaza '96. The event was made possible by the spirit that in part fuels the jazz machine: the devotion to the form by its audience, in particular this night's host, United States diplomatic representative Joe Sullivan. I had the sense we were going to enjoy ourselves when we scouted out the residence—a sprawling stone mansion overlooking the city of Havana, in the town's equivalent of Beverly Hills—and discovered Miles Davis' *Kind of Blue* flowing from a pair of vintage Bose speakers in the foyer.

Our original intention had been to record to 16-track with the band playing outside on the large marble patio behind the residence. All was a gloriously sunny "go" until an ominous dark mass began to form on the horizon to the north. A huge thunderstorm ferro-

—CONTINUED ON PAGE 225

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In its 12-year history, the TEC Awards has raised nearly \$300,000 for these worthy causes, while offering attendees the opportunity to mingle with audio and music industry luminaries at what has become one of the most important annual events for audio professionals.

The TEC Awards are divided into three major categories—Technical, Creative and Institutional Achievement—and 26 sub-categories. Voting for the TEC Awards winners is a two-step process. A Nominating Panel, comprising approximately 150 prominent members of the professional audio industry, makes initial selections in March. Their nominations appear on the Voting Ballot in subscriber copies of this issue of *Mix*. The winners of the Twelfth Annual TEC Awards will be announced at a ceremony on Saturday, November 9, at the Biltmore Hotel in Los Angeles.

Half of the proceeds will once again be donated to hearing conservation programs—to Hearing Is Priceless (HIP), co-founded by *Mix* magazine and the House Ear Institute of Los Angeles, and Hearing Education and Awareness for Rockers (H.E.A.R.). The HIP campaign seeks to educate music listeners, especially young people, about the dangers of noise-induced hearing loss. The House Ear Institute is a nonprofit organization supported entirely by private donations, and has been a recipient of TEC Awards funds since 1986. H.E.A.R., a San Francisco-based nonprofit organization, works to educate the public, especially musicians, about the dangers of noise-induced hearing loss.

Fifty percent of the TEC Awards proceeds will be distributed to past winners and nominees of the TEC Award for Recording School/Program that have already established scholarship or grant programs with TEC Awards funds, and to scholarships and other educational programs of the Audio Engineering Society Educational Foundation and the Society of Professional Audio Recording Services. A portion of the proceeds will also go to the TEC Awards Scholarship Fund to assist deserving individuals pursuing careers in audio and currently enrolled in audio programs.

TEC Awards Hall of Fame



The TEC Awards Hall of Fame was created in 1988 to recognize the contributions of those special individuals who, during their lifetimes, have best exemplified the spirit of creative and technical excellence in professional audio. This year, the TEC Awards will honor the late **Willi Studer**, founder of Studer Revox.

Les Paul Award



The Les Paul Award was created in 1991 to honor individuals or institutions that have set the highest standards in the creative application of technology. This year the Les Paul Award is being presented to **Brian Wilson**, composer, producer and vocal mastermind of the Beach Boys.

Awards Voter's Guide

1996 TEC Awards Sponsors

Platinum Sponsors

Cardinal Business Media

Cardinal Business Media, Ft. Washington, Pa., is the publisher of *Mix*, *Mix Spanish Edition* and *Electronic Musician*. It also publishes the *Recording Industry Sourcebook* and operates Mix Bookshelf, the leader in information resources for music professionals. The company is a diversified information services provider that publishes 17 magazines, operates four trade shows and runs two book publishing operations. In addition to the music and entertainment field, the company has properties in the high-technology, sports/fitness, vision and retail industries.

JBL Professional

In its 50th anniversary year, JBL Professional is proud to serve as a Platinum Sponsor of the TEC Awards for the 12th straight year. JBL is the world's preeminent manufacturer of state-of-the-art professional loudspeakers and speaker components for music, contracting, tour sound, cinema and recording/broadcast applications. JBL Professional is part of the Harman International network of professional and consumer audio and video companies.

Gold Sponsors

Alesis Corporation

Founded in 1984, Alesis Corporation is a leading manufacturer of professional audio equipment and musical instruments. Best known for its creation of popular, value-packed recording equipment, Alesis has received TEC Awards for its ADAT Digital Multitrack Recording System, as well as its signal processors, synthesizers, monitor speakers and drum machines.

AMS Neve

Based in the UK, AMS Neve plc supplies facilities worldwide with mixing and editing systems for film, video post-production, broadcast, music recording and live/theater applications. AMS Neve's product range includes the Capricorn, Logic Series and Libra digital mixing consoles; the AudioFile hard disk recorder/editor; the VR Legend analog mixing console; and the 55 Series analog broadcast console.

Disc Makers

Disc Makers offers major label-quality CD and cassette manufacturing for independent bands and studios. Complete packages include free award-winning design and printing, along with the only money-back guarantee in the business. New Disc Makers services include professional mastering at The SoundLab™ and their new "five days or it's free" printing service.

Harman Music Group (formerly DOD)

Founded 22 years ago by its president, John Johnson, DOD has evolved into a state-of-the-art factory utilizing the latest computer-aided manufacturing and testing equipment. DOD is an integrated leading manufacturer of signal processing equipment, digital effects processors, equalizers, limiters, crossovers, mixers, pedals and other audio electronic components. DOD, DigiTech, dbx and Allen & Heath are trademarks of the Harman International family.

Meyer Sound Laboratories, Inc.

Meyer Sound continues to break new ground with its Self-Powered Series of loudspeaker systems, including the full-range MTS-4 and the High-Q MSL-4. Since its founding in 1979, Meyer Sound has designed and manufactured high-quality loudspeaker systems, equalizers and sound measurement tools, providing systems for a variety of venues, including Carnegie Hall, and for tours with performers such as k.d. lang.

QSC Audio Products/Sound Image

QSC Audio Products: Since 1968, QSC Audio Products, Inc., of Costa Mesa, Calif., has engineered and manufactured the finest power amplifiers and advanced audio systems in the professional audio industry, including the revolutionary PowerLight Series. **Sound Image:** Celebrating its 25th year in the live sound reinforcement industry, Sound Image has new expanded headquarters in Escondido, Calif., and offices in Nashville. The Design, Sales and Installation Division, inaugurated in 1991, has been highly successful.

Solid State Logic

Solid State Logic changed the world of recording and mixing forever when it introduced a fully functioning, in-line console with direct control of external tape machines and a built-in automation system. The company has continued to improve and refine the art and science of audio production in music, broadcast, film and television post-production. SSL's innovative use of digital technology has consistently set new standards.

Sony Professional Audio

Sony Professional Audio has established its track record by leveraging its unique position as both an inventor and manufacturer of pioneering audio hardware technologies. Continuing its tradition of innovation, Sony has recently introduced the Oxford OXF-R3 24-bit digital recording console and the PCM-3348HR 24-bit, 48-track recorder.

Tektronix, Inc.

For 50 years, Tektronix has been synonymous with signal measurement, from its first oscilloscope, the Type 511, to today's professional audio monitoring equipment. Tektronix products range from handheld troubleshooting devices to MPEG-2 signal analysis. Its professional audio equipment—including the 764 Digital Audio Monitor—are at work in recording and broadcast studios, factories and post facilities around the world.



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Skywalker Sound

Outstanding Institutional Achievement

Awarded to those companies, facilities or institutions that have contributed most significantly to excellence and innovation in audio during the eligibility year.

A. ACOUSTICS/FACILITY DESIGN COMPANY

Russ Berger Design Group, Inc., Dallas, TX: As a leader in the architectural/acoustical design field, RBDG has provided design for more than 50 projects during the eligibility year. A partial list includes Houston Lighting & Power; Reel FX; screening rooms for ABC Studios, Sony/Tree and Walter Bennett Communications; CNN, TNN; KERA; NFL Films; WBUR-radio; and recording studios for Mel Tillis, Daryl Simmons, Music Mill Studios and Whitney Houston.

Tom Hidley Designs: During the eligibility period, Tom Hidley completed the 10Hz infrasound "Tracking Room" at Masterfonics in Nashville.

Pelonis Sound, Los Angeles, CA: During the eligibility period, Pelonis Sound completed Future Disc Mastering, Hollywood (three-room project, two redesigns and one ground up); Interlock Studios, Hollywood (mix stage, as well as Foley room featuring waveless water pit); Davidson & Associates, Torrance; Disney, Orlando (Euphonix mixing room); Mad Dog Studios, Burbank (control room); Orangewhip Studios, Santa Barbara (modular control room); Peer Music, Hollywood; John Tesh, Sherman Oaks (control room/studio); Premiere Post, Hollywood (mixing stage and Foley/ADR room); and Synchronesh Studios, Birmingham (control room and studio).

studio bau:ton, Los Angeles, CA: During the eligibility period, studio bau:ton completed Royaltone Studios, North Hollywood; EFX Systems, Burbank, LA Recording Workshop, North Hollywood; Dubey Tunes, San Francisco; Anacapa Studio, Malibu; Murielle Hamilton Studio, Pacific Palisades; Mesmer A/V, Culver City; Audio Cafe, Hollywood; Leeway Entertainment, Santa Monica; Rocktropols/Internet Holdings Group, Hollywood; Mega Studio, Paris, France; The Embassy Studio (Peter Wolf), Weiler, Austria; Tremens Film, Vienna, Austria; Estudios Churubusco Aztecas, Mexico City; and VTU Production Studios, Ho Chi Minh City, Vietnam.

Walters-Storyk Design Group, Highland, NY: Eligibility year projects include Sweetwater Studios, Saratoga Springs, NY; Cotton Hill Studio, Albany, NY; SynchroSound, Kuala Lumpur, Malaysia; Russian Hill Studios, San Francisco; Clive Davis (home theater), NYC; American Academy of Arts, NYC; Coupe Recording, Boulder, CO; Parallax Audio, NYC; Betelgeuse, NYC; AR Studios (World Studio Group member), Rio de Janeiro, Brazil; Kampo Recording, NYC; First Edition, NYC; Shaq O'Neal home studio, Orlando, FL; Interlochen Public Radio, Interlochen, MI; Moody Broadcasting, Chicago, IL; and Echo Studios, Jupiter Beach, FL.

B. SOUND REINFORCEMENT COMPANY

Audio Analysts, Colorado Springs, CO: The 1995-1996 season was one of innovation for Audio Analysts. With the implementation of its new technologically advanced AALTO speaker system, tours during the eligibility period included Alan Parsons, U.S. and Europe; Bruce Springsteen, U.S. and Europe; Natalie Merchant, U.S.; Ringo Starr, U.S.; and Wynonna Judd, world tour.

Clair Brothers Audio, Lititz, PA: Touring clients during the eligibility period included Page & Plant, R.E.M., The Eagles, Bon Jovi, Seal, Elton John/Billy Joel, Tim McGraw, Amy Grant, Bush, Lynyrd Skynyrd, Joe Cocker, Little Texas, Bob Dylan, Steve Miller, Kitaro, Johnny Hallyday, Rusted Root, DC Talk, Steve Perry, Indigo Girls and Young Messiah. With more than 30 years of experience, Clair Brother Audio includes both touring and installation divisions, as well as worldwide offices in Lititz, PA; Nashville, TN; Mexico City; Basel, Switzerland; Tokyo; Sydney, Australia; and Singapore.

Electrotec Productions, Inc., Westlake Village, CA: Electrotec sound systems were the choice of Tom Petty, Lenny Kravitz, Rod Stewart, David Bowie/Nine Inch Nails, Queensryche, Black Sabbath, Green Day, Ted Nugent/Bad Company, Alabama, Garbage, Joan Armatrading and Power Rangers. The company acquired UK-based Audio Lease in December 1995 and now offers services from Westlake Village, CA; Nashville, TN; and Cambridge, England. Principals include Pierre D'Assogues, president, and Jim Douglas, operations manager.

Showco, Inc., Dallas, TX: Worldwide credits include: Rolling Stones Voodoo Lounge World Tour, Bob Seger, Janet Jackson, Alanis Morissette, Reba McEntire, Alan Jackson, Phil Collins, Soundgarden, Vince Gill, Boston, Jeff Beck/Santana, Harry Connick Jr., Ozzy Osbourne, Pantera, James Taylor, Linda Ronstadt, Kiss-Japan, Clint Black, Ritchie Blackmore's Rainbow, Megadeth, Beach Boys, Extreme, Farm Aid VII, Gin Blossoms, the Highwaymen, Moody Blues, Willie Nelson, PBS Town Hall, Joe Satriani, Charlie Sexton, Siouxsie & the Banshees, Luther Vandross, George Strait-Texas Stadium/Alamodome, The Cult, Ministry, Anita Baker and the Arizona State Fair.

Sound Image, Escondido, CA/Nashville, TN: Touring clients included Brooks & Dunn, Jimmy Buffett, Mary Chapin Carpenter, Melissa Etheridge, Barbara Mandrell, Jackson Browne, Peter Dinklage, The Mavericks, All 4 One, Joe Diffie and Boz Scaggs. Seasonal S/R installations included Los Angeles Philharmonic, the San Diego Symphony, the Del Mar Fair, San Diego Street Scene, the Long Beach Blues Festival, Humphrey's Concerts by the Bay and the 1995 Alcoholics Anonymous Worldwide Convention, held at Jack Murphy Stadium. Sound Image also built and installed systems at the Hollywood Bowl, Advanced Cardiovascular Systems, Advanced Marketing Seminars, Shrimboat Studios, the Hotel Del Coronado and the San Diego Navy Veterans Hospital.

C. MASTERING FACILITY

Bernie Grundman Mastering, Hollywood, CA: During the eligibility period the studio worked on projects by such artists as Michael Jackson, Alanis Morissette, 2PAC, Johnny Gill, Montell Jordan, Selena, R Kelly, Quincy Jones, Bone Thugs N Harmony and Delinquent Habits.

Bob Ludwig's Gateway Mastering, Portland, ME: Eligibility year credits include Mariah Carey *Daydream*, Tori Amos *Boys for Pele*, Natalie Merchant *Tigerlily*, Sting *Mercury Falling*, Janet Jackson *Design of a Decade*, Gloria Estefan *Abriendo Puertas*, Lou Reed *Set the Twilight Reeling*, Green Day *Insomniac*, Tears for Fears *Raoul and the Kings of Spain*, Bryan Adams/*Don Juan DeMarco* soundtrack, Bryan Ferry/Roxy Music *Greatest Hits*, Everclear *Sparkle and Fade*, Melissa Etheridge *Your Little Secret* and Matthew Sweet *100% Fun*.

Future Disc Systems, Hollywood, CA: Projects mastered during the eligibility period included Hootie & the Blowfish *Cracked Rear View*, Boyz II Men *II*, Offspring *Smash*, *Pulp Fiction* soundtrack, Candlebox *Candlebox*, Nine Inch Nails *The Downward Spiral*, *Waiting to Exhale* soundtrack, Marilyn Manson *Smells Like Children*, Gerald Albright *Acoustically Speaking*, Stabbing Westward *Wither, Blister, Burn & Peel*, Ministry *Filthip*, All 4 One *And the Music Speaks*, Tracy Chapman *New Beginnings*, Iggy Pop *Naughty Little Doggy*, and Kirk Franklin *What Cha Lookin' 4*.

Georgetown Masters, Nashville, TN: Georgetown Masters completed albums for Mark Knopfler, Keith Richards, Edgar Meyer, Mark O'Connor, Yo Yo Ma, David Ball, Vince Gill, George Strait, Acoustic Alchemy, Willie Nelson, Garth Brooks, Trisha Yearwood, Faith Hill, Alison Krauss, Nanci Griffith, Dolly Parton, Pam Tillis, Ruby Lovett, Gretchen Peters, Martina McBride, Mary Chapin Carpenter, Janis Ian, CeCe Winans, Iris DeMent, Bela Fleck, Duane Eddy, Junior Brown, Chet Atkins, The Tractors, Wynonna Judd and Etta James.

Masterdisk Corporation, New York, NY: During the eligibility year, Masterdisk worked on albums such as the Smashing Pumpkins *Mellon Collie and the Infinite Sadness*, Blues Traveler *Four*, Garbage *Garbage*, Method Man *Tical*, Lenny Kravitz *Circus*, Spacehog *In The Meantime*, Bob Dylan *MTV Unplugged*, Herbie Hancock *The New Standard*, David Sanborn *Pearls*, Soul Asylum *Let Your Dim Light Shine*, Indigo Girls *2,000 Curfews*, Sonic Youth *Washing Machine*, Joshua Redman *Moodswing* and *Live at the Village Vanguard*, P.J. Harvey *To Bring You My Love*, The Toadies *Rubberneck* and Rancid *...And Out Come the Wolves*.

D. AUDIO POST-PRODUCTION FACILITY

Howard Schwartz Recording, Inc., New York, NY: During the eligibility year, this nine-room audio post-production facility worked on *Toy Story*, *Hunchback of Notre Dame*, *Pocahontas*, *Third Rock From the Sun*, *New York Undercover*, *The Nanny Christmas Special*, *ABC Wide World of Sports*, *Shell's Wonderful World of Golf*, *Peter Jennings Reports Oklahoma Bombing Special*, *CBS World Ride With Charles Kuralt*, *Sergei Glinkov...A Celebration on Ice*, *Sesame Street*, and spots for American Express, IBM, Wendy's, Miller Beer and Sears.

Pacific Ocean Post Sound, Santa Monica, CA: Among Pacific Ocean Post Sound's commercial credits are Lotus "Sony" and "Fed Ex" and Coca-Cola "Olympics." Other projects include digital sound mixing for *The Rolling Stones: Stripped*, Bonnie Raitt: *Road Tested* and the Shoah Foundation's *Survivors of the Holocaust*. POP Sound also mixed the music score of Disney's *The Hunchback of Notre Dame* and provided Dolby AC-3 mixing for MGM Home Video's recent releases of *Dr. Zhivago* and *Fiddler on the Roof*.

Skywalker Sound, San Rafael, CA: Eligibility year credits include (features): *Casper*, *The Celluloid Closet*, *Follow Me Home*, *Home for the Holidays*, *Jumanji*, *The Last Supper*, *Nine Months*, *Species*, *Strange Days* and *Toy Story*; (imax) *Arkansas*, *The Great American West*, *Sol Films Mexico*, *Ozarks*, *Zion and Mexico*; (commercial) Coca-Cola "Secret Weapon," Hallmark "Magnets," National Potato Board "Potato," Orkin "Roach Bar," and Pepsi "Casper/Refrigerator," and (music recording/scoring): Boz Scaggs, Gary Ramal, Harmonia Mundi, Isaac Stern and Robert Macdonald, Kathie Gislisler and Kronos Quartet.

Sony Music Studios, New York, NY: During the eligibility period, the Sony Music Studios audio post department worked on *The Dana Carvey Show*, *MTV Unplugged*, *Mariah Carey Live From Madison Square Garden*, *Bruce Springsteen-Blood Brothers*, *VH-1 Duets*, *Carole King Tapestry Revisited*, *Carly Simon Live From Grand Central Station*, *Marvin Gaye-A Tribute*, *Mary Chapin Carpenter Live from Wolf Trap*, *TV Nation*, *Def Comedy Jam*, *Tribute to Bill Clinton from Ford's Theater*, and *Peter, Paul and Mary Lifelines*.

Sync Sound, New York, NY: Sync Sound mixed three of the five Oscar-nominated documentaries, as well as the winner, *One Survivor Remembers*. Five films mixed at Sync Sound were invited to the Sundance Film Festival. Additional projects included *Homicide* (NBC), *Beavis and Butt-head* (MTV), *The Barbara Walters Specials* (ABC), *The Metropolitan Opera* (PBS), *The Head* (MTV), *Turning Point* (ABC), *Gypsy Kings—Live at Wolf Trap* (NHK), and *Aliens in the Family* (ABC).

E. REMOTE RECORDING FACILITY

Effanel Music, Inc., New York, NY: Eligibility year credits include the 38th Annual Grammy Awards telecast, the *MTV Video Music Awards*, *The Foo Fighters—Live in London*, *The Newport Jazz Festival*, the Pope's Mass at Central Park, five segments of *MTV Unplugged* (Seal, Alice in Chains, Tori Amos, Chris Isaak and Kiss), the VH-1 Fashion Awards, *Mariah Carey—Live at Madison Square Garden*, *REM—Live in Dallas*, *Elvis Costello—Live at the Beacon Theater*, *MTV's 120 Minutes* and *Alternative Nation* and the *Billboard Music Awards*.

Le Mobile, Encinitas, CA: During the eligibility period, Le Mobile recorded Tracy Chapman, Reba McEntire, Nine Inch Nails, Adam Sandler, Dingo Boingo, Tish Hinojosa, Peter Frampton, and Jimmy Page/Robert Plant; live broadcast performances with Red Hot Chili Peppers, Ozzy Osbourne, Jackson Browne, Gin Blossoms, Los Lobos, Silverchair The Toadies, VH-1 Melissa Etheridge Duet, and 1996 Movie Awards; and (movie scoring) *Kansas City*, *Now & Then*, *Amanda*, *Pinocchio*, *Dead Man*, *The Arrival*, *Disney El Captain* and *Festival of Fools*.

Remote Recording Services, Lahaska, PA: Eligibility year credits include Bonnie Raitt—*Road Tested*, a live CD and concert film; *Die Hard with a Vengeance*, and *Mr. Holland's Opus*, orchestral film scores; *Live From the Metropolitan Opera*, a season of live television shows; 1995 Grammy Awards and Rock & Roll Hall of Fame Opening, live television broadcasts, Dave Matthews Band, New Year's Eve live radio broadcast; and Wynonna Judd, network television special.

Sheffield Audio Video Production, Phoenix, MD: Sheffield A-V Productions eligibility year credits include the MTV Music Awards, the Grammy Awards, *Live From The House of Blues* TV series, *Late Show With David Letterman* (Los Angeles), the *Jazz Central Series*—Black Entertainment TV, *Boston Pops Series*—PBS, *Billboard Music Awards* and the Aerosmith tour.

Westwood One Mobile Recording Division, Culver City, CA: Westwood One is busy throughout the year recording and mixing concerts for its internationally syndicated *Superstar Concert Series* and *In Concert* programs. A few of the artists they worked with during the eligibility period include Page/Plant live from the Shark Tank in San Jose, Doobie Brothers, Van Halen, Bush, Dasis, Seal, Hootie & the Blowfish, Alanis Morissette, Bad Religion, Joan Osborne and Foo Fighters.

F. RECORDING STUDIO

Hit Factory, New York, NY: During the eligibility period Hit Factory worked with Mariah Carey, Paul Simon, Anita Baker, Tony Rich, Madonna, Boyz II Men, Celine Dion, Toni Braxton, Michael Jackson, TLC, Notorious B.I.G., Quincy Jones, *Waiting to Exhale*, Whitney Houston, David Bowie, Luther Vandross, *Pocahontas*, John Mellencamp, *Hunchback of Notre Dame*, SWV, Bette Midler, Mary J. Blige, Selena, Michael Bolton, Soul For Real, Heavy D., *Birdcage*, *Smokey Joe's Cafe*, *Company*, Freedy Johnston, Junior M.A.F.I.A., Silk, Vanessa Williams, Jodeci, Kathleen Battle, Dawn Upshaw, Itzhak Perlman, *Get Shorty*, Spin Doctors, Take That, Total, Faith Evans, Slick Rick, Michael Franks, Sarah Brightman, Pat Metheny, Placido Domingo, Bob James, Rollins Band, LL Cool J, Run DMC, Lisa Stansfield, Guy Tevin Campbell, 112, *Sunset Boulevard*, Deion Sanders, Chaka Khan, Robert Plant & Jimmy Page, Mandy Patinkin, Bonnie Tyler, Groover Theory, Montell Jordan, Natalie Cole, Cissy Houston, Tina Turner, Chantay Savage, Nuno Bettencourt, Yoko Ono, Aaliyah, Stevie Wonder, Billy Joel, *Anastasia*, *First Wives Club* and the Bee Gees.

Masterfonics, Inc., Nashville, TN: Masterfonics has done a wide range of projects over the past year. The three studios, "The Mix Room," "Studio Six" and the new "Tracking Room" (opened in October) have been busy. Some of the artists that recorded and/or mixed in them during the eligibility period include Hank Williams Jr., Suzy Bogguss, Vince Gill, Trace Adkins, Randy Travis, Collin Raye, Alabama, Tanya Tucker, Bad Company, Faith Hill, John Berry, The Judds, George Strait, Reba McEntire, Patty Loveless, Diamond Rio and Neil Diamond.

Ocean Way Recording, Los Angeles, CA: Ocean Way's seven studios have custom API, Focusrite and Neve consoles with GML Automation; 100-input SSL G+ and 9000J, with Ultimotion. Studio 1 houses a discrete 80-input Neve 8078. Eligibility year projects included Tori Amos, Black Crowes, Johnny Cash, Green Day, Michael Jackson, Quincy Jones, R. Kelly, Dave Matthews Band, Willie Nelson, Bonnie Raitt, R.E.M., Brian Setzer, Travis Tritt, Wallflowers, *Toy Story*, *Dead Man Walking*, *The Craft*, *The Cable Guy*, *Mission Impossible* and *The Hunchback of Notre Dame*.

Record Plant, Los Angeles, CA: During the eligibility period, Record Plant worked with Celine Dion, Vanessa Williams, Babyface, Toni Braxton, Luther Vandross, Johnny Gill, Social Distortion, Porno for Pyros, AC/DC, Bob Dylan, Liza Minnelli, Richard Marx, and international artists Luis Miguel, France Gall and Mari Hamada. Films included *Waiting to Exhale*, *Pocahontas* and *Forget Paris*.

Sony Music Studios, New York, NY: During the eligibility period, Sony Music Studios was involved in projects for pop, classical and jazz artists, including Tony Bennett, Michael Bolton, Blues Traveler, Mariah Carey, Harry Connick Jr., Corrosion of Conformity, Des'ree, Celine Dion, Dionne Ferris, Sophie B. Hawkins, Michael Jackson, Natalie Merchant, Nas, Ozzy Osbourne, Patra, The Presidents of the United States of America, Soul Asylum, Bruce Springsteen, Emmanuel Ax, Kathleen Battle, Placido Domingo, Yo Yo Ma, Wynton Marsalis, Bobby McFerrin, Marcus Roberts and Isaac Stern.

Outstanding Creative Achievement

Awarded to those individuals or teams who have achieved the highest levels of excellence in professional audio during the eligibility year

A. AUDIO POST-PRODUCTION ENGINEER

John Alberts: Alberts worked on *MTV Unplugged*; *Mariah Carey Live From Madison Square Garden* (Fox); *Bruce Springsteen-Blood Brothers* (Disney); *VH-1 Duets*; *Carole King Tapestry Revisited* (Lifetime); *Carly Simon Live From Grand Central Station* (Lifetime); *Marvin Gaye-A Tribute* (MTV); *Mary Chapin Carpenter Live From Wolf Trap*, *TV Nation* (Fox) and *Def Comedy Jam* (HBO).

Lon Bender/Per Hallberg: During the eligibility period, the team of Hallberg and Bender worked on *Braveheart*, winner of the Academy Award for Best Sound Effects Editing.

Rick Dior/Scott Millan/Steve Pederson/David Macmillan: The team of Dior, Millan, Pederson and Macmillan mixed *Apollo 13*, winner of the Academy Award for Best Sound.

Ken Hahn: Mixing credits include *One Survivor Remembers* (1996 Oscar winner) and *Real Sex* (HBD); *Mystery Science Theater 3000—The Feature* (Universal Pictures); *Gypsy Kings—Live at Wolf Trap* (NHK), *Hollywood Sound*, *Opening Night at Carnegie Hall*, *Julie Andrews—Back on Broadway*, *20 Years of Dance in America*, *In Performance at The White House*, *Language of Life and Pavarotti—My World* (PBS); *Mr. Willoby's Christmas* (Henson/ABC); *Aliens in the Family* (ABC); *How To Succeed in Business Without Really Trying* (Grammy-nominated Broadway cast album) and *Alexander Nevsky* (Grammy-nominated, BMG).

Gary Rydstrom/Gary Summers: During the eligibility period, the team of Rydstrom and Summers worked on *Casper* and *Toy Story*.

B. REMOTE/BROADCAST RECORDING ENGINEER

Biff Dawes: During the eligibility period Dawes recorded and mixed numerous concert series shows for Westwood One's programming and live radio broadcasts, including: Trisha Yearwood, Hootie & the Blowfish and the Playboy Jazz Festival.

Randy Ezratty: Randy Ezratty is the owner and systems designer of Effanel Music. Eligibility year credits include the 1996 Grammy Awards telecast, *Elvis Costello*, *VH-1 Storytellers* and *MTV Unplugged* for Kiss.

Ed Greene: Eligibility year credits include Kennedy Center Honors, *Christmas In Washington*, Neil Diamond's *Under The Tennessee Moon*, the Grammy Awards, the Emmy Awards, the Tony Awards, *A Capitol Fourth* (PBS), *National Memorial Day Concert* and *Pittsburgh Pops Symphony*.

John Harris: John Harris is Effanel Music's lead mixer. Credits include Lou Reed—"Magic & Loss," *MTV's Video Music Awards*, Columbia Records' *Radio Hour*, *The Jon Stewart Show*, Tony Bennett "Live By Request," the 1996 Grammy telecast, Eric Clapton and Dr. John *VH-1's Duets*, the Rock and Roll Hall of Fame, *MTV Unplugged* segments (Sheryl Crow, Hole, The Cranberries, Melissa Etheridge, Live, Lenny Kravitz, Alice in Chains, Seal and Tori Amos), *Elvis Costello—Live at the Beacon Theater*, *VH-1 Fashion Awards*, *Billboard Music Awards*, *REM—Live in Dallas*, *Bruce Springsteen—Live at Tower Theater in Philadelphia* and the *Foo Fighters—Live in London*.

David Hewitt: David Hewitt is president and chief engineer of Remote Recording Services. Eligibility year engineering credits include Rolling Stones Live in Miami (home video remix); Hard Rock Hotel Las Vegas Opening (live television broadcast); Jimmy Page and Robert Plant (live tour recording); Julie Andrews' Broadway play, *Victor/Victoria* (live television recording); John Pizzarelli Live at the Algonquin (live CD); and Live From the Met 95/96 season (live television recordings).

C. SOUND REINFORCEMENT ENGINEER

Robert Colby: During the eligibility period, Robert "Cubby" Colby was front-of-house mixer for Phil Collins' Far Side of the World tour from mid-March through mid-May. He recorded the shows to ADAT, then later mixed them for future use during June, July and August 1995. Colby was also a Billboard Awards music mixer and front-of-house mixer for Bob Seger and the Silver Bullet Band's It's A Mystery tour.

Dave Kob: Kob mixed front-of-house sound for Jimmy Page and Robert Plant's Unleaded tour. Musicians included a six-piece acoustic/electric rock band, an eight-piece Egyptian violin/percussion ensemble, a 20-plus piece locally contracted string section, a hurdy-gurdy player and occasional belly dancer. The 13-month, 112-show tour played to audiences ranging from a 200-seat pub in London to a 50,000-seat open-air festival in Brazil. It also included tours of North and South America, Europe, Japan and Australia.

Ricky Moeller: During the eligibility period, Moeller was front-of-house engineer for Reba McEntire, mixed the Tennessee Performing Arts Center video *Starting Over*, and mixed the Reba McEntire Frito Lay commercial.

Greg Price: Price's engineering projects over the last year include The Cult, The Doobie Brothers, Foreigner, Boston and Ozzy Osbourne, who he is currently working with on a sold-out world tour. Price's clients have taken him through 20 countries, using a variety of equipment in different situations. In addition to his mixing duties, Price oversaw live recordings, simulcasts and audio-for-video for these artists. This year, as in other years, Price has had articles published about his engineering techniques.

Robert Scovill: During the eligibility year, Scovill was enlisted as front-of-house mixer for Tom Petty and the Heartbreakers' Dogs With Wings world tour. During his stint with Petty, Scovill's duties included mixing Petty's concert sound for more than 150 sold-out shows, as well as multitracking live audio for television specials and live CD releases, in addition to mixing live radio broadcasts. Scovill also hooked up with Toto for a European tour of more than 40 cities.

D. MASTERING ENGINEER

Greg Calbi: During the eligibility year, Calbi mastered projects such as Blues Traveler (Grammy Award-winning single "Run-Around") *Four* album, Bob Dylan *MTV Unplugged*, David Sanborn *Pearls*, Lenny Kravitz *Circus*, Sarah McLachlan *The Freedom Sessions*, Sonic Youth *Washing Machine*, Jane Siberry *Maria*, Loudon Wainwright III *Grown Man*, Ruth Ruth *Laughing Gallery*, John Scofield *Groove Elation*, Yo La Tengo *Electr-O-Pura*, Guided By Voices *Under the Bushes, Under the Stars*, Yellowjackets *Dreamland*, Cassandra Wilson *New Moon Daughter*, Will Downing *Moods*, Bobby McFerrin *Bang! Zoom*, and Girls Against Boys *House of G Vs. B*.

Bernie Grundman: During the eligibility period Grundman worked on recordings by Michael Jackson, Sergio Mendes, Selena, R Kelly, Simply Red, and internationally, Luis Miguel, Yumi Matsutoya and Umberto Tozzi.

Ted Jensen: CDs Jensen worked on during the eligibility period include White Zombie *Astro Creep 2000* (one of the few Hard Rock/Metal albums to be nominated for an Engineering Grammy), Eagles *Hell Freezes Over* (nominated for an Engineering Grammy), Dave Matthews Band *Crash*, Madonna *Something To Remember*, SilverChair *Frogstomp*, GooGoo Dolls *A Boy Named Goo*, and Patti Rothberg *Between the 1 and 9*. Also this year were albums by The Verve Pipe, Pat Metheny, Babylon Zoo, Luther Vandross, Lisa Loeb, The Story, Dada and Local H.

Bob Ludwig: Eligibility year credits include: Mariah Carey *Daydream*, Tori Amos *Boys for Pele*, Natalie Merchant *Tigerlily*, Sting *Mercury Falling*, Janet Jackson *Design of a Decade*, Gloria Estefan *Abriendo Puertas*, Lou Reed *Set the Twilight Reeling*, Green Day *Insomniac*, Cowboy Junkies *Lay It Down*; Bryan Adams/*Don Juan DeMarco* soundtrack, Melissa Etheridge *Your Little Secret*, k.d. lang *all you can eat*, Tracy Bonham *The Burdens of Being Upright* and Matthew Sweet *100% Fun*.

Denny Purcell: During the eligibility period, Purcell completed albums for Mark Knopfler, Keith Richards, Edgar Meyer, Mark O'Connor, Yo Yo Ma, David Ball, Vince Gill, George Strait, Acoustic Alchemy, Willie Nelson, Garth Brooks, Trisha Yearwood, Faith Hill, Alison Krauss, Nanci Griffith, Dolly Parton, Pam Tillis, Ruby Lovett, Gretchen Peters, Martina McBride, Mary Chapin Carpenter, Janis Ian, CeCe Winans, Iris DeMent, Bela Fleck, Duane Eddy, Junior Brown, Chet Atkins, The Tractors, Wynonna Judd and Etta James.

E. RECORD PRODUCER

Glen Ballard: Eligibility year credits include Alanis Morissette's *Jagged Little Pill*.

Tony Brown: Projects during the eligibility year included Marty Stuart *The Marty Party Hit Pack*, Rodney Crowell *Jewell of the South*, Tracy Byrd *Love Lessons*, George Strait *Strait Out of the Box*, Reba McEntire *Starting Over*, Mark Chestnutt *Wings*, Vince Gill *Souvenirs*, Bobbie Cryner *Girl of Your Dreams*, Nanci Griffith *Buddy Holly Tribute Album "That's Alright,"* and Wynonna *Revelations*.

Trevor Horn: Eligibility year credits include *Seal* by Seal.

Rick Rubin: During the eligibility period, Rubin produced Tom Petty *Wildflowers*, Red Hot Chili Peppers *One Hot Minute* and AC/DC *Ball Breaker*.

Don Was: Eligibility year credits included Brian Wilson *I Just Wasn't Made For These Times* soundtrack; Highwaymen *The Road Goes On Forever*, Kris Kristofferson *A Moment of Forever*, The Rolling Stones *Stripped*; Randy Newman/Lyle Lovett "You've Got A Friend in Me" (from *Toy Story*); Bonnie Raitt "You Got It," Jonell Mosser "Crossroads," Stevie Nicks "Somebody Stand By Me" (from *Boys on the Side*); and Randy Newman *Faust*.

F. RECORDING ENGINEER

David Bianco/Richard Dodd/Jim Scott: During the eligibility period, the team of Bianco, Dodd and Scott engineered Tom Petty's *Wildflowers*.

Ed Cherney: During the eligibility period, Cherney recorded and mixed Bonnie Raitt *Road Tested*, mixed Jackson Browne *Looking East*, recorded the Rolling Stones *Stripped* and mixed Bob Dylan *Unplugged*.

Bob Clearmountain: Albums recently mixed by Bob Clearmountain include the self-titled *2nd Collective Soul* LP, the Rolling Stones *Stripped*, Bon Jovi *These Days*, The Corrs debut *Forgiven Not Forgotten*, Wet Wet Wet *Picture This*, four new tracks on Bruce Springsteen's *Greatest Hits* and four tracks on Tori Amos' *Boys for Pele*, including "Caught A Light Sneeze." Singles he mixed include Bryan Adams' "Rock Steady" and Rod Stewart's "So Far Away."

Mick Guzauski: During the eligibility period Guzauski worked on Mariah Carey's *Daydreams*, Boyz II Men's "Water Runs Dry" and All 4 One's "I Can Love You Like That."

Bruce Swedien: Completed projects during the eligibility period included Quincy Jones' *O's Jook Joint* and Michael Jackson's *HIStory*.

Outstanding Technical Achievement

Awarded to those products or innovations that have made the most significant contributions to the advancement of audio technology during the eligibility year. Note: The following product descriptions were supplied by the companies nominated.

A. ANCILLARY EQUIPMENT

Apogee Electronics AD-1000: The AD-1000 20-bit A/D converter from Apogee features premium-quality microphone preamps with phantom power and line level inputs. Sync options and interfaces include AES/EBU, ADAT and S/PDIF, and a digital calibration oscillator. It has Apogee's UV22® process for transferring the detail of 20-bit signals flawlessly into the 16-bit domain. Latest enhancements include PaqRat-compatible 20-bit recording/playback and the FC, which converts between ADAT optical and DA-88 TDIF formats.

Audio Precision System Two: System Two is the next-generation true Dual Domain® audio analyzer used by professionals worldwide for product design, production and service applications. It offers a unique combination of performance, features and flexibility, including guaranteed specifications like analog residual THD+N of -108dB, digital analyzer dynamic range of 140dB and 48-bit FFT dynamic range. System Two also analyzes and measures digital interface and control status information and interface pulse stream signals, both according to AES3 spec.

dB Technologies AD122 22-bit A/D: The AD122 is the stereophonic analog-to-digital converter of choice among today's most demanding professionals. Far surpassing standard conversion devices, the AD122 actually measures -122 dB THD+N, the most accurate measurement of performance. Utilizing proprietary technology, the combination of superior linearity, fast and accurate transient response, extremely small quantization steps and low noise performance enables the AD122 to produce a true 24-bit digital audio stream accurately emulating the smoothness of analog.

Otari PicMix: Designed for mix-to-picture applications, Otari's PicMix products bring calibrated multichannel surround sound monitoring and panning into virtually any audio console. The PicMix modular approach is cost-effective and is compatible with Dolby Stereo, and Dolby Digital, DTS, SDDS and HDTV surround formats. Presets for speaker levels and channel assignments permit instant recall of multichannel monitoring configurations. The panner rack, along with the joystick/knob panner controller, provide flexible multichannel panning.

Symtrix 620 20-bit A/D: The 620 20-bit A/D converter features true 20-bit quantization, selectable output word size, dither and noise shaping. The 620 outputs digital data in either AES/EBU or S/PDIF digital formats at sample rates of 48, 44.1, 32 or 22.05 kHz. Digital inputs are provided as well. For multimedia production applications, the 620 down-samples from 44.1 kHz to 22.05 kHz, as well as bit-rate converts from 16 to 8 bits.

Whirlwind MASS Connector (pinable type): Whirlwind's MASS multichannel connector is machined from a solid block of aluminum and fitted with hard composite pin blocks and MIL-spec gold-plated pins. Its unisex pin block design means that users never find themselves with "the wrong end" of a MASS terminated cable. Designed to protect critical connections against moisture and extreme physical abuse, it is now specified as standard equipment by major sound companies, broadcasters and recording facilities.

B. MIC PREAMPLIFIER TECHNOLOGY

Amek-Rupert Neve RCMA: The RCMA Remote Controlled Microphone Amplifier allows Rupert Neve's microphone amplifiers to be located remotely, eliminating the need to send mic level signals over long distances. Parameters are digitally controlled either from the RCMA front panel or the remote control unit. Each RCU allows up to 64 mic channels (eight RCMA devices) to be operated together to provide a complete microphone input section. An optional 20-bit digital output is available.

ART Tube MP: ART's Tube MP provides the user with the latest state-of-the-art tube microphone preamp. The Tube MP offers a superb level of sound quality by using a special tube and integrated circuit design providing exceptional signal integrity. The active balanced input utilizes a hybrid multiple-paired transistor/top amp design providing extremely low noise. The XLR output is active balanced, and the 1/4-inch output is unbalanced. Switchable phantom power is also available.

ATI Pro⁴ Multi-Mode Audio Processor: The ATI Pro⁴ is based on the input module found in the legendary Paragon mixing console. A high-voltage mic preamp, highpass and lowpass filters, parametric EQ, compressor, ducker and noise gate provide six stages of audio control in a single compact unit occupying only one rackspace. Each segment can be switched in or out independently, and extensive facilities are provided for visual monitoring of the signal, stereo linking and sidechain control.

Crookwood Paintpot: The Paintpot dual-channel microphone preamplifier is designed to surpass the most exacting recording requirements. A unique blend of discrete and integrated concepts, Paintpot is intended to be placed near the source and drive, at line level, back to the recording input. All local features of the system, including M-S decoding and tilt equalization, can be remotely addressed via the Control Pot. Up to 16 dual devices (32 preamps) can be configured with one remote.

Focusrite Red 7: The Red 7 is a combined mic preamplifier and dynamics processor principally for vocal use, both speech and song, where every subtle nuance captured by the mic may be amplified and enhanced by a combination of compression and either de-essing or excitation to enable the ultimate recording or live performance. Applications include post-production (voice-overs), overdubs, radio and television work, as well as recording studio, concert and theater sound.

Night Technologies, Inc. PreQ³: The PreQ³ is the only full-featured microphone preamp with NTI's VARible AirBand™ equalizer, usable also on line inputs. The adjustable, high-frequency shelf equalizer can move above the mic hiss and bring out the high end before any distortion is introduced by any active circuits. The PreQ³, with switching power supply, transformer-coupled inputs and actively balanced outputs, provides four channels in a single rackspace, and is also available as a 2-channel upgradable unit.

C. AMPLIFIER TECHNOLOGY

Crown Studio Reference I/II: The Crown Studio Reference amplifiers are designed to be the most sonically accurate amplifiers available. A distinct lack of coloration of any type keeps the mix clean, true and transient. The Studio Reference low-frequency ultimate damping factor exceeds 20,000. Both models offer stereo, bridged-mono and parallel-mono modes for optimum flexibility. Studio Reference I & II amplifiers are housed in finely crafted packages taking up only four rackspaces.

Focusrite Red 5: Designed for critical monitoring, the Red 5 precision stereo power amp features a huge peak capacity and outstanding frequency and phase responses. Dynamically coupled power supply rails ensure that the power supplies are consistently operating as a truly balanced system, fully protected without any signal-degrading sensing resistor or fuses. The output stages run in A/B mode with a sliding bias arrangement, and the output circuit has a very low inductance allowing "difficult" loudspeaker loads without compromise.

Mesa Engineering The Baron: This all-tube, hand-built, dual-mono amp has separate power transformers and AC cords. Output is switchable between 150 watts all-pentode, 100 watts triode/pentode and 50 watts triode/triode (triode and switches allow more options). Components include self-balancing, dual-differential drive circuitry, six 5881 tubes, and four-way selectable feedback circuit. The front panel has large VU meters and switches for bias/balance adjustment, meter selection (power or adjust) and standby mode.

QSC PowerLight™ 4.0: The PowerLight 4.0, QSC's most powerful amplifier to date, boasts exclusive Powerwave Switching Technology™, delivering 1,400 watts per channel into 4 ohms and 2,000 watts into 2 ohms in a 3U package weighing less than 30 pounds. Its three-step, high-efficiency output and very stiff supply rails offer phenomenal bass and high end. Features include -105dB unweighted S/N; remote AC control, HD-15 "data port" for full control, load monitoring and power standby via Ethernet and QSC's new MultiSignal Processor.

Stewart Electronics PA-500: The PA-500, also known as the Pro Reference 500 (PR-500) is perfect for professional recording studios, broadcast, and studio applications. The PA-500 is convection-cooled, featuring polished chrome face plates, gold-plated input and output connectors and harmonic shift correction. It occupies a single rackspace and is backed by Stewart's five-year warranty. The PA-500 will accept balanced and unbalanced signals by XLR or 1/4-inch phone jacks.

D. COMPUTER SOFTWARE & PERIPHERALS

Apogee Electronics MasterTools: A mastering plug-in for Digidesign's Pro Tools TDM system, MasterTools features a three-dimensional metering system that displays both current peak/average stereo levels and phase, and their history "Overs" are indicated and can be logged, while the special "Nova™" (no over) feature ensures that digital overs do not make it to the final master. Central to MasterTools is the UV22 encoding scheme, which takes 20-bit signals and flawlessly encodes them into the 16-bit domain.

Digidesign DINR v. 2.0™ TOM: DINR is a software-based digital signal processing module that "plugs-in" to both TDM and/or Sound Designer II-equipped systems, enabling the user to reduce the full spectrum of unwanted noise, from air conditioner rumble to guitar-amp buzz. DINR offers two modes—one tailored for broadband noise, such as tape hiss; the other for more "pitched" noise, such as hum. DINR is a highly useful and cost-effective option available for all of Digidesign's Macintosh-based recording and editing systems.

Emagic Logic Audio 2.5: The Logic Audio 2.5 seamlessly integrates MIDI sequencing, professional quality scoring and up to 48 tracks of hard disk recording into one program available for either the Mac or Windows platform. Besides offering an unmatched level of configurability, Logic Audio boasts the highest resolution of any available sequencer (960ppq), unlimited MIDI tracks and scoring staves, and an onboard Sample Editor with a suite of DSP functions, including Time Expansion/Compression, Pitch Shifting and Audio Quantization. Furthermore, Logic Audio is the only program of its kind to allow the use of multiple digital audio interfaces simultaneously.

Macromedia Deck II 2.5: Award-winning software for professional-quality multitrack music and sound production. DECK II Digital Audio Workstation for the Macintosh enables users to arrange an unlimited number of audio elements in time, play up to 32 tracks at once, and record new tracks while hearing previously recorded tracks. Users can simultaneously manage hundreds of files, then arrange, synchronize and mix those tracks into a professional audio production on a Power Macintosh. No additional audio hardware or software is required.

Mark of the Unicorn Digital Performer 1.6: Digital Performer 1.6 combines state-of-the-art MIDI sequencing with Pro Tools III support (up to 48 channels), the Mixing Board™ virtual console for integrated TDM™, MIDI, digital audio mixing and effects, built-in digital video window, real-time MIDI output processing including velocity compression, MIDI Machine Control, SMPTE synchronization, zoomable waveform display with any number of tracks in one window, and much more.

Opcode Studio Vision Pro: This Macintosh MIDI sequencing and digital audio recording software features mixing consoles, track overview, notation, groove quantize and powerful DSP plug-ins, such as audio-to-MIDI, MIDI-to-audio, time compression, pitch shift and EQ. Studio Vision Pro supports MIDI Machine Control, SMPTE Synchronization and the Open Music System (OMS). The program performs seamless digital audio editing when teamed with Digidesign's Pro Tools III, TDM, Session 8, Audiomeia II or Apple's Sound Manager.

E. MICROPHONE TECHNOLOGY

Audio-Technica AT873R: Natural sound quality, elegant design and rugged dependability distinguish the AT873R wide-range, hand-held condenser microphone. Its combination of high sensitivity and SPL capability delivers exceptional performance for live sound reinforcement and studio applications. Supplied hypercardioid polar pattern is easily altered via optional interchangeable elements (available in cardioid, subcardioid and omnidirectional). Tri-level screen system provides excellent pop-protection, while superior internal shock-mounting minimizes handling noise.

Earthworks OM1/TC30K: Earthworks OM1 and TC30K utilize a small, very accurate omnidirectional capsule, stainless steel body and innovative circuitry for accurate, coherent response from 9 Hz to 30 kHz. They are excellent for all applications where natural, uncolored sound is desired and the SPL level is moderate to extremely high. They work well with upright bass, drum overheads, kick drum, acoustic and electric guitar, brass, vocals (chorus and solo), instrumental ensembles and location recording.

Microtech Gefell M900: The M900 condenser mic features a large-diameter capsule suited for recording vocal and instrumental soloists in studios and in acoustically difficult stage environments. Its cardioid pattern exhibits smooth frequency response in free and diffuse fields, for superb performance on axis. It has the sonic qualities of a large studio mic, but its small size makes it quite easy to get into tight spots. The state-of-the-art electronics include a transformerless balanced output.

Peavey PVM™ T9000: The PVM T9000 tube microphone system combines a self-polarized condenser capsule with a vacuum-tube preamplifier to provide the mellow warmth for which tube microphones are revered. Its smooth, extended-range frequency response, uniform cardioid directional pattern and up to 137dB SPL handling is ideally suited for studio vocals and other critical applications. The unique, multipurpose shock suspension incorporates a finned heat-sink to help dissipate tube filament heat.

Sanken CSS-5 Stereo Shotgun: Sanken's CSS-5 is an extremely compact shotgun microphone with switchable mono/stereo functions. The revolutionary five-capsule design provides precise directional pickup for production audio in film/video, broadcast and sports events. A significant advance in microphone technology, the CSS-5 is especially effective in the 400Hz to 3kHz range, which largely contributes to stereophonic perception. The CSS-5 has excellent mono/stereo compatibility, and its frontal sound characteristics remain unchanged when switching from mono to stereo.

Shure Beta 58A: The Shure Beta 58A is a high-output supercardioid dynamic vocal mic for professional sound reinforcement and project studio recording. It maintains a true supercardioid pattern throughout its frequency range, ensuring high gain before feedback, maximum isolation from other sound sources and minimum off-axis tone coloration. Its shaped frequency response is ideal for close-up vocals. Rugged construction, a proven shock-mount system and hardened steel mesh grille protect it from road hazards.

F. SOUND REINFORCEMENT LOUDSPEAKER TECHNOLOGY

Eastern Acoustic Works KF860/KF861 Virtual Line Array: The KF860/KF861 Virtual Line Array achieves real low-frequency directivity by integrating three or more compact, portable enclosures into a single acoustical unit. Virtual Line Array Technology has been developed as a solution to the conflicting requirements of events that have both live and broadcast audiences, including high SPLs and full bandwidth reproduction for the live audience; minimal "spill" onto the stage where wireless and podium mics are typically used; and unrestricted sightlines for television cameras.

JBL Professional EON System: JBL's EON system is based around bi-amped, powered speakers and enclosures molded from polypropylene with a cast-aluminum front baffle/horn. The EON 15 has 50/130 watt amps, 15-inch woofer, neodymium HF driver and BiRadial horn—in a 39-pound cabinet angled for main or monitor chores. Heat sinks are mounted in the woofer ports for extra cooling. A powered subwoofer and powered 10-inch, two-way version are available.

L'Acoustic V-DOSC™: V-DOSC elements are identical, modular and designed to be arrayed vertically. When coupled, the array generates a predictable, cylindrical wavefront. Adding enclosures allows the user to build and shape a layered wavefront and sound field. This field is totally free of phasing, comb filtering and lobing interferences, and can be focused on the desired area. V-DOSC offers accurate, adjustable coverage control with previously unattainable results. It is the only full-bandwidth, perfectly coherent line array.

Martin Wavefront 8: The Martin W8 is a three-way enclosure utilizing 6.5-inch and 12-inch horn-loaded cone technology. The compact trapezoidal footprint is capable of high SPLs (135 dB) while at the same time delivering unprecedented fidelity in the touring industry. Specifications include an 80-18kHz bandwidth, constant 55° horizontal dispersion, and a 30° vertical dispersion. With 3.5 kHz being the point at which a compression driver is introduced, the system lacks harshness and allows for highly articulate mid-band performance.

Meyer Sound Labs MTS-4: The MTS-4 is a fully integrated reinforcement loudspeaker system. The control electronics, quad amplifiers and drivers are contained within the enclosure. The system features a triple-tuned cabinet, with each driver in its own compartment. The MTS-4 utilizes 18-inch, 15-inch and 12-inch LF driver and one 2-inch throat (4-inch diaphragm) HF driver. Frequency response is 26 Hz to 18 kHz. The modular amplifier utilizes the Intelligent AC® system to provide automatic voltage selection.

Professional Audio Systems RS-2.2: The RS-2.2 full-range, single-enclosure reinforcement loudspeaker system uses TOC™ (Time Offset Correction) technology, a compact system with extended bandwidth and acoustical compatibility in arrays. Space efficiency and 40x60-degree pattern control provides flexibility to sound companies that service medium and large venues. Sound companies nationwide have chosen the RS-2.2 as the solution that addresses the diversified applications in today's sound industry. The RS-2.2 requires PAS Model TOC R2 active filter set.

G. STUDIO MONITOR TECHNOLOGY

Bag End Studio-A Monitoring System: The system provides a flat frequency response beyond the range of human hearing and wider than the digital recording formats in use today. This wide-band performance not only assures the ability to accurately monitor the audio signal at the extreme ends of the spectrum, but the audible range is effortlessly reproduced. Its coaxial Time-Align® design coupled with the musically connected ELF bass provides superbly accurate reproduction in the frequency and time domains.

Dynaudio Acoustics BM15: The Dynaudio Acoustics BM15 is a two-way monitor system that uses a new 8.5-inch bass driver with a 4-inch voice coil and the 1.1-inch Esotech tweeter found on several models. Power handling is 250W/ch. Peak handling is in excess of 1,000W/ch. Frequency response is 40 Hz-20 kHz. Applications include project studio mains, high-output near-fields and LCRS satellites. Dynaudio Acoustics' production techniques reduce costs while maintaining high-quality standards.

Genelec 1039A: The 1039A three-way active control room monitor system features two 15-inch woofers, Genelec's 5-inch mid, and a 1-inch hard dome tweeter set into Genelec's proprietary Directivity Control Waveguide™. This provides further control of the system to its acoustic environment, maximizing frequency balance and stereo imaging. Amplification is provided by 1,270 watts per channel with unparalleled sonic accuracy.

KRK RoK Bottom: Designed to provide superior low-end response in close-field monitoring applications, the RoK Bottom utilizes the same unique enclosure shape as KRK's popular K•RoK, which minimizes parallel walls to maximize low-end punch. The 2.1-cubic-foot enclosure features a 12-inch polyglass long-stroke woofer with a metric sensitivity of 91 dB, LCRC summing 140-watt power amplifier and internal crossover.

Tannoy AMS 10A: The AMS 10A bi-amplified, fully active, fully powered reference monitor uses a 10-inch dual-concentric, point source driver, a sophisticated power module and active circuitry to deliver dynamic, articulate sound with exceptional stereo imaging. The system features linear amplitude and phase (on and off axis), and independent HF and LF high-current MOSFET amplifier modules producing 160 watts each continuous. The electronics do not utilize compression or limiting to ensure transients are reproduced with astonishing impact.

Westlake Audio Lc6.75: The Lc6.75 is a unique, 100% hand-built, two-way loudspeaker designed to be an affordable compact monitor with the "Westlake Sound." The 3/4-inch soft-dome tweeter, dual ports, aligned cabinet and 6.5-inch polypropylene woofer produce a frequency response of <60Hz-18kHz +/- 3dB. Power handling 80W continuous, and it measures 16 (H) x 8 (W) x 10 (D), with a weight of 22 pounds.

H. MUSICAL INSTRUMENT TECHNOLOGY

Alesis DM5 18-Bit Drum Module: The Alesis DM5 packs 548 drum and percussion sounds in a compact single-rackspace unit. It offers a huge selection of sounds that encompass studio drums, world/ethnic percussion, orchestral drums and specialized sounds for techno, industrial, rap and dance music. The DM5 may be controlled via MIDI or through its 12 rear panel drum trigger inputs (with built-in MIDI converters). Performance features include Random Sample mode, Expanded Dynamic Articulation and MIDI overflow.

Digidesign Sample Cell II™: SampleCell II is a powerful Macintosh RAM-based sample playback system designed for professional music, sound design and post-production applications. When combined with a SampleCell TDM card and a ProTools III system, it provides seamless sample playback integration into a ProTools III session at 20-bit resolution. The combination of SampleCell with TDM allows unlimited processing of samples through Digidesign and third-party plug-ins. SampleCell's intuitive Editor makes instrument creation simple, and couples that with powerful database functions.

Ensoniq KT-88: The KT-88 features unparalleled piano feel coupled with a completely programmable synthesizer/sequencing system, 88-key weighted piano action, 64 voices, 308 on-board sounds and full GM support. Fast transposing, up to eight zones for splits, layers and MIDI control make the KT-88 perfect for performance. Ensoniq's SoundFinder™ interface simplifies sound selection. An onboard 16-track sequencer and access to a large library of ROM sound cards and RAM memory cards round out the package.

Korg Trinity Plus: The 61-key Trinity Plus utilizes a newly designed PCM-based tone generation system operating at 48 kHz. It employs 375 Multisounds and 258 drum samples (24MB PCM ROM). The TouchView™ high-res LCD touchscreen display is standard, as are more than 100 effect types (up to ten simultaneously) with real-time control, four outputs and an 80,000-note, 16-track MIDI sequencer. A DSP-based Solo Synthesizer enhancement delivers physically modelled analog synthesizer and emulative sounds.

Kurzweil K2500XS: The K2500XS (88 weighted keys) is an integrated production synthesizer, sampler and master MIDI controller featuring Kurzweil's acclaimed Variable Architecture Synthesis Technology synthesis engine. Features include 48 voices, a 600mm ribbon controller, eight programmable real-time sliders, a 32-track sequencer, analog and digital I/O, 8-channel proprietary outputs (KDS-Kurzweil Digital Stream) and compatibility with CD-ROM sample libraries from Akai, Ensoniq and Roland.

Roland VG-8 V-Guitar System: The VG-8 allows accessing classic amp/guitar tones from the past or creating new sounds for the future, yet the VG-8 is unlike any other guitar processor or synth. Unlike a guitar synth, the VG-8 with GK-2A pickup doesn't transform picking into a complex series of MIDI data; it processes the entire waveform and "models" it into the desired sound. The player's picking style is translated exactly as it is performed, with all the subtleties.

1. SIGNAL PROCESSING TECHNOLOGY

dbx 1066: The dbx 1066 is a dual-channel compressor/limiter/gate driven by the all-new dbx V2™ VCA featuring True RMS Power Summing™ stereo operation. Each channel features PeakStopPlus™ limiting, power-dependent attack and release or user-definable attack and release. Hard-Knee or Overeasy® compression, and selectable +4dBu or -10dBV operating levels. New lightpipe LEDs and sidechain external and sidechain monitor functions make setup a snap.

DigiTech Studio Quad: The Studio Quad features four independent inputs and outputs that give the user the power of four separate mono processors or two true stereo processors. Imagine two true stereo sources simultaneously without sacrificing control. Imagine four independent reverbs for vocals, guitar, keyboards, and each reverb can be optimized to achieve the best audio for each application. Imagine the power to create any combination of effects, in any order. Then multiply by four.

Ensoniq DP/4+: The top end of Ensoniq's professional signal processors, the DP/4+ offers four discrete 24-bit processors in an integrated package. With four inputs and four outputs, the DP/4+ handles from one to four input signals, with true stereo processing and output submixing for easy integration into the studio environment. Fifty-four algorithms and 400 presets range from high-quality reverbs and delays to compression, speaker simulations, duckers and guitar amps.

Lexicon PCM90: The PCM90 offers Lexicon's highest-quality reverb in an affordable package. It provides the sought-after reverb programs of Lexicon's world-class digital effects systems, complete with a powerful new interface, with the convenience of easy access and a wealth of program capabilities for discerning professionals. The PCM90 features 250 all-new presets, exclusive keyword search, custom controllers, dynamic patching, tap tempo/tempo control, dynamic spatialization and a PC card slot for expansion and upgrades.

Sony DPS-V77: The DPS-V77 is a 2-channel digital signal processor offering a dual-effects block architecture, each containing more than 60 different effects, including reverbs, delays, modulation effects, intelligent pitch shifting and dynamic filtering. The flexible dual-effects structure allows for serial, parallel and dual-mono processing. Additionally, a morphing structure offers a seamless transition from preset to preset. The DPS-V77 has XLR and 1/4-inch analog I/Os, and AES/EBU and S/PDIF digital I/Os.

tc electronic M2000: The TC M2000 is a "Dual Engine" 24-bit stereo effects processor featuring 256 factory presets, including reverb, delay, pitch, bending, EQ, de-essing, compression, limiting and expansion. Dynamic Morphing™ switches between two effects at a user-definable threshold. Highlights include on-board owner's manuals, six routing modes, 20-bit AD/DA conversion, AES/EBU and S/PDIF digital I/O, Preset Glide, 16-bit dithering tools, four Snapshot memories and Tap/MIDI tempo modes.

RECORDING DEVICES/ STORAGE TECHNOLOGY

Alesis ADAT-XT 8-Track Digital Audio Recorder: The Alesis ADAT-XT is the next generation of the world's most popular professional recording format. The ADAT-XT features an intelligent software-controlled transport that operates up to four times faster than the original ADAT. Its improved digital converters result in better sonic quality, while its onboard digital editing and autolocation tools make it a powerful tool for music recording and other professional audio applications.

JRF UltraAnalog 2-Inch, 8-Track Head Assembly: On the cutting edge of retro, UltraAnalog combines the "fatness" and "warmth" of analog with near-digital dynamic range. Output is greater than 10 dB hotter than that of standard 24-track. A discrete ninth track (timecode) is positioned at the standard "track 24" location. Track layout is playback-compatible with standard 16- and 24-track, 2-inch formats. Also available for Studer A80 and A827 recorders.

Panasonic SV-3800: Building on the performance and reliability standards set by the SV-3700, the SV-3800 offers increased user control of all functions and improved performance features, with 20-bit playback resolution, front panel selection of digital I/Os and SCMS-defeat, adjustable analog output levels and independent L/R input levels. The single program play function plays program material up to the next start ID, then stops until the "play" key is pressed again.

Pioneer D-9601 DAT Recorder: The D-9601 is the world's first DAT recorder capable of recording at 44.1, 88.2 and 96 kHz. In high-sampling mode, recordings capture higher harmonics that are important for transient and spatial perception. An on-board sample rate converter provides 44.1/48kHz digital output of a 96kHz recording. Other features include AES/EBU and S/PDIF digital I/O, balanced analog I/O, RS-422 Sony 9-pin control and double-speed digital copying between two machines.

Rane PaqRat: Rane's RC 24 PaqRat is a cost-effective solution for the studio wishing to produce high-quality 18- to 24-bit masters. The RC 24 allows easy recording and playback of 18- to 24-bit stereo tracks using four 16-bit tracks from a digital 8-track machine. The RC 24T is used with the Tascam DA-88. The RC 24A is used with the Alesis ADAT and Fostex RD-8.

360 Systems Instant Replay: This digital audio recorder offers immediate access to 1,000 individual audio cuts of any length, stored on a 4-, 8- or 16-hour internal hard disk using Dolby AC-2 compression. Cuts are mapped to 50 panel-mounted buttons for ready access in ten user-groups. Features include built-in sample rate conversion, bright VF display, AES/EBU and S/PDIF digital I/O, analog +4dBu I/O and a printer port. It's self-contained, portable and weighs 9.5 pounds.

WORKSTATION TECHNOLOGY

Akai DR16 Disk Recorder: The DR16 combines 16 tracks of audio from a single disk, nondestructive and random-access editing tools, and an automatable 16-channel digital mixer. Its expandable hardware platform offers speed, stability and reliability that computer-based products can't match. Available enhancements include a VGA display card, ASCII keyboard input, up to 32 channels of 3-band parametric digital EQ and MIDI, SMPTE, RS-422, bi-phase and ADAT sync. Multiple DR16s can be controlled via the DL16 tactile remote control surface.

Digidesign Pro Tools® III v.3.2: With the release of Pro Tools III v.3.2, Pro Tools software has become the common centerpiece of all Digidesign Macintosh-based digital audio production systems. Regardless of which hardware platform the user chooses, Pro Tools' core recording, editing and mixing environment remains the same, providing Session compatibility and mobility. Pro Tools III v. 3.2 also includes PowerMix™—the Digidesign audio engine (DAE™) technology that allows Pro Tools software to run on qualified PowerPC-based Macintosh computers with no additional Digidesign hardware.

E-mu Darwin™: Darwin is a stand-alone, disk-based 8-track recorder that combines workstation features with tape-based system ease-of-use, all at a price competitive with ADAT and DA-88 modular digital multitracks. Darwin features an icon-based graphic user interface, a 240x64 graphic display and six soft keys to provide powerful DAW-style editing. Darwin options include ADAT digital I/O and sync for complete ADAT/BRC compatibility, SMPTE and DSP option cards.

Roland VS-880: The VS-880 is the first self-contained workstation to integrate a digital recorder, digital mixer, digital editor and multieffects processor—priced for the average musician. Data storage for the VS-880's 64 digital tracks (eight primary tracks, eight virtual tracks per primary track) is via an internal Iomega Jaz® drive with removable 1 GB cartridge or a fixed hard drive. An expansion slot can be fitted with the VS8F-1 Effect Expansion Board with two stereo multieffects processors.

SADiE Master System: The SADiE Master System enables mastering to Exabyte DDP, Red Book CDR and 1630. With Exabyte DDP, the user gets verification not only that the PQ list read back from the Exabyte tape is correct, but also verification of the integrity of the audio on the tape. In addition, SADiE allows audio to be replayed directly from DDP tape, so cues can be previewed to ensure correct positioning. Mastering to recordable Red Book CDs can occur at twice the normal speed.

Sonic Solutions Multitrack USP: Sonic Solutions' Multitrack USP cards are designed to offer the ultimate in digital audio workstation performance. With 24 channels of 24-bit digital audio playback and 16 channels of digital and analog I/O, SonicStudio is ideal for music production and editing, film scoring, and audio post applications. Up to six SonicStudio cards may be used in a single system, creating a 96-channel digital audio production system.

L. SOUND REINFORCEMENT CONSOLE TECHNOLOGY

Allen & Heath GL3000: The GL3000 is Allen & Heath's latest in the line of flexible front-of-house or monitor consoles. This 8x2x1 front-of-house console with eight auxiliary sends and four bands of EQ is switchable to a full-function dedicated stage monitor console with eight mixes plus an engineer's wedge mix.

Crest Century Vx: The Century Vx has eight VCA groups, eight audio groups, four mute groups, a 21-VU meter bridge, eight matrix outputs, true LCR panning and fully balanced buses on all eight aux send systems. Other features include eight aux sends per channel and 4-band sweep EQs with switchable Q on the mids and switchable peak/shelf on the high and low bands.

Mackie SR24•4: A true 4x2x1 bus, the SR24•4 has 20 mic/line and two stereo line inputs, and six independent balanced aux sends with masters. Channels 1-20 have high/low shelving and mid-sweep EQ (100Hz-8kHz); stereo channels 21-24 have high/low shelving and hi-mid and lo-mid peaking EQ. All channels have OL, -20dB signal present and mute/solo (PFL/AFL) LEDs. Patented mic pres offer 60dB of gain; four subs are balanced with special 16kHz "air" EQ. Four stereo aux returns with several routing options are available.

Midas XL200: The XL200 has 40 mono input modules with mic preamps, eight aux sends, eight VCA subgroups, six mono and two stereo subgroups, eight mute groups and space for an additional four input modules. The XL200 retains the traditional Midas motherboard design, with all input and insert connectors integral to each module. Optional MIDI automation allows users to set up to ten mute groups.

Ramsa SX-1: The Ramsa SX-1's versatile mixing and routing capabilities enable it to function comfortably as a front-of-house or monitor board. Available in 32-, 40- and 48-input configurations, the SX-1 offers a 20-aux, 10-matrix mixing environment with ten VCA subgroups and ten mute groups. MIDI Snapshot Scene automation stores all fader settings, channel and on/off buttons, mute group assignments and VCA subgroups to 128 internal memory locations.

Soundcraft K3 Console: The modular 8-bus Soundcraft K3 sound reinforcement console is available with a choice of 16-, 24-, 32-, 40- and 48-channel frame sizes and modules. The K3 Standard Input model delivers everything required for general-purpose live mixing, with a high-spec, wide range mic preamp, classic Soundcraft 4-band EQ, paired routing to groups and LED input metering. An integral MIDI control module provides the K3 with comprehensive "scene set" automation, enabling the user to recall mute groups and make program changes to external MIDI effects devices at the touch of a button.

M. SMALL FORMAT CONSOLE TECHNOLOGY

Mackie MS1402-VLZ: The MicroSeries 1402-VLZ is a 14x2 stereo mic/line mixer with 45mm faders, 3-band EQ, six mic/line channels with high-headroom/low-noise mic preamps, four stereo inputs, an extra stereo bus, AFL/PFL, solo on all channels, balanced inputs and outputs (including XLR outs), mega-monitoring flexibility, and VLZ—(very low-impedance circuitry) for low noise and high headroom.

NVision NV1055: The NVision NV1055 is a four-layer, 4x1 digital audio mixer. Each AES3 output channel is generated as a 4-to-1 linear mix of the inputs. Other features include channel swapping, independent phase inversion and gain adjustment for each input. Four unique 4x1 mix setups are easily defined, and each finished mix is assigned to either channel of either AES3 output. Gain adjustments for each output channel are also provided.

Oram Series 8: Developed by John Oram, acclaimed "father of British EQ," this analog 8-bus recording console with 16-, 24- and 32-input options uses surface-mount technology, unique to all Oram designs. Incredibly low noise and amazing Oram Sonics® EQ Magic™ originated with Oram's Vox and Trident designs. Individual channel modules and sturdy construction preserve vintage values, complemented by robotic assembly, confirming Oram's philosophy: perfect quality with futuristic engineering geared to tomorrow's economies.

Spirit ProTracker ProTracker is an 8-channel, in-line, multitrack recording mixer in a 3-rackspace enclosure. Each of the eight channels (16 in remix) has balanced line and mic inputs with phantom power, switchable limiters on each channel, PFL, overload LED indicator, highpass filtering and direct channel output. Other features include a stereo effects return, 2-track monitoring return, LED output meters and expansion sockets for daisy-chaining multiple units.

Tascam M-2600MKII: Designed to interface with modular digital multitracks or hard disk systems, the next-generation Tascam M-2600MKII 8-bus recording console is available in 16-, 24- or 32-channel configurations. This insert automation-ready console features two stereo and four mono aux sends, low-noise circuitry and premium-quality mic preamps. With features like balanced and unbalanced tape inputs and outputs, 48V phantom power and direct/group out switching, the M-2600MKII is the ideal console for multitrack recording.

Yamaha 02R: The Yamaha 02R all-digital recording console features real-time automation with snapshot memory and instant reset of all console parameters, including control of its internal compressors and effects via a powerful onboard computer. Architecture consists of 40 digital and analog inputs, 26 digital outputs and eight aux sends. Compressor/limiter gates are included on every input and bus, as are two internal effects processors. It digitally interfaces with ADAT, DA-88, AES/EBU, S/PDIF and Yamaha-format recorders.

N. LARGE FORMAT CONSOLE TECHNOLOGY

D&R Merlin: Merlin features snapshot recall of all console routings and templates, 4-band fully parametric EQ in both paths, highly automated dual-signal paths, 12 discrete aux sends (switchable to 36), and the power of Merlin's Advanced Routing Multiplex, D&R's new digitally controlled routing matrix. With Merlin's true dual-input path design, the limitations of traditional in-line and pseudo-dual input consoles disappear. A 32-input module Merlin is an uncompromised 64-input mix machine.

Euphonix CS2000: The CS2000 is designed for post applications in film/TV—wherever automated mixing to multiple stems (stereo or multichannel with full surround sound panning) is required. Systems are available for one to three operators with surround panning for up to 48 faders per operator. The Mix Controller surface places all controls within reach of the operator; the central assignable controller—with its integral real-time color display of EQ and dynamics functions—make for fast, simple operation.

Otari Corporation Status: The Status digitally controlled analog console features dual-input architecture, console-wide image recall, fader grouping, snapshot automation and fader and mute automation—all standard. Moving faders, dynamics and stereo input modules are optional. The 12 buses and eight auxes can be sourced from either the mix or channel path. The 4-band sweepable EQ can be assigned to either path or split between the two, and 24-, 32-, 40- and 48-dual input module frames are available.

QSC/Stage Tec Cantus: Cantus is an automated digital console that uses the latest 24-bit DSP technology, offering the flexibility and power of digital control combined with an ergonomic interface. A single channel strip can control up to ten separate audio channels simultaneously, allowing 480 channels in a single 7-foot console. DSP functions include parametric EQ, filter, delay, expansion and dynamic processing for each channel. Configurations are saved in the built-in computer, allowing quick reconfiguration for each session.

Soundcraft DC2020 Console: The Soundcraft DC2020 allows facilities to offer clients a highly specified automated console that delivers performance and flexibility far exceeding its modest price. A touchscreen-driven onboard computer controls all console automation, machine control and project management. Extremely easy to learn and operate, the DC2020 allows users to remotely control popular digital and analog tape machines. Functions include Auto Play/Return, Drop In/Out points, Record/Enable and Preview. Projects can be stored to hard or floppy disks.

Solid State Logic Axiom: Axiom can be personally configured to fit the special needs of broadcast on air, sound-to-picture post, music recording or film dubbing. Axiom's totally digital signal path removes the need for repeated conversion, providing preservation of the original signal. Creativity is maximized; Axiom incorporates an unprecedented level of dynamic automation. A single keystroke, instantaneous reset can be applied to selective controls or systemwide. It also features an integral router and multitrack hard disk recorder, facilitating true tapeless recording.

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World Radio History



POST-SCRIPT

SOUND FOR FILM

**A LETTER TO
PICTURE EDITORS**

PART 1

by Larry Blake

Dear Picture Department: I suppose that those of us in post-production sound shouldn't begrudge the world of picture editing the sense of freedom brought about by nonlinear, hard disk-based editing. Being freed from the shackles of splicing tape and inflexible tape-to-tape offline editing has to feel at least as liberating as it did to us. (Although I hear you have a harder time than we do in justifying to producers what, if any, extra costs are involved. I'll try to touch upon those aspects when possible.)

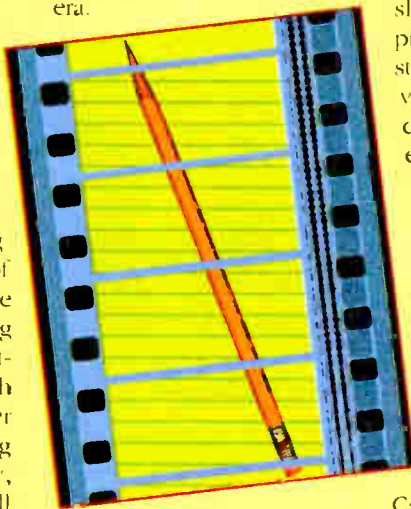
What follows are a series of suggestions to help your picture and my sound departments interface as smoothly as possible, keeping technogrief to a minimum:

- Establish a dialog with your production mixer and with post-sound in advance of shooting. I know that producer types sometimes don't want everyone talking; it's amazing that they have no idea of how much money we could save them if they would just let us talk among ourselves. What could they possibly view as the down side of such a dialog?

It is crucial that we all agree and understand the path that picture and sound will take on their way from shooting to picture editing to sound editing to mix to an-

swer print. And when it's agreed on a path to take...

- Do a sync test. This is real simple. Shoot a continuous 9-minute take with someone talking, holding a timecode slate and clapping the sticks about once every two minutes. Then do two other short takes with the remaining film left in the camera.



Have the picture and track printed twice each: One set will remain uncut as a bible roll for your telecine house; the second set will be conformed after you do a test edit, intercutting among all three takes. (This is a simplification of the process, but I think you get the point.)

The best time to shoot a sync test is in the few days right before shooting begins, when the camera and sound teams are checking out equipment and the editorial department has just been hired. This will allow you to limit your variables because the chain will involve the production camera, *the* production recorder, *the* telecine facility and *the* nonlinear editing system.

While such a sync test will solve a multitude of post-production problems by telling us that your numbers and pic-

tures do (or do not) match up, it will be of even greater help to you in providing a sense of security that the shooting/telecine editing conforming process really does work. Just like the old adage "a watched kettle never boils," a nontested nonlinear system is never up and running in the first week of shooting. While so many problems end up being real stupid and simple (software version problems, they didn't ship the right cables, etc.), just as often they are fundamental and serious (like the telecine facility doesn't have a clue as to what they're doing). And, as always, please observe Blake's Third Law of Disagreement: Don't let anyone tell you that no one has ever complained before or that this is what they do for James

Cameron. Repeat after me and tell them to read your lips: "I am complaining and my name is not James Cameron."

In the days of 35mm sprocketed picture and work-track, sync was taken for granted, with clunky old clapsticks providing an absolute sync reference that was preserved by inked edge-coding. In those not-so-olden times, when dialog editing would begin, we would receive the spliced work track, indicating exactly where edits were made in addition to the source scene and take of each piece of the track. Also, any 1:1 copies of the worktrack were in exact sync with the original; there was never any doubt. Today, there are many more paths in the road to cutting dialog—and many more places to screw up. Sometimes there's

—CONTINUED ON PAGE 104

"JAZZ CENTRAL" SKIPS THE REMIX

by Eric Rudolph

Robert Jackson has the full panoply of state-of-the-art multitrack recording gear at his disposal every time he tracks and posts jazz dates for Black Entertainment Television's *Jazz Central* program and their recently inaugurated 24-hour Cable Jazz Channel. However, Jackson, BET's senior audio engineer, prefers to "get it right the first time," and masters live mixes straight to DAT.

Artists such as Wynton Marsalis, Joshua Redman, Holly Cole, Dave Brubeck, Abbey Lincoln, Ramsey Lewis, Jean Luc Ponty and many others, along with scores of distinguished bandmembers, have appeared in hourlong in-concert segments on *Jazz Central* and the Cable Jazz Channel. Most have been quite pleased with Jackson's first-time, only-time mixing approach.

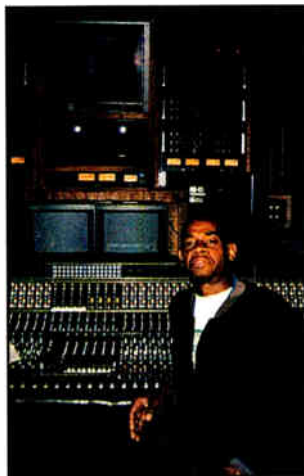
"It's an aesthetic decision, because I prefer to let the spontaneity of the live set come through," Jackson explains, adding that there is, technically, time to remix. "We also save time and money this way, though those are not the main reasons we normally do not remix."

The May and June slate of 29 tapings, which were staged two per-day in a nightclub setting during weeklong production stretches in BET's new Washington, D.C., soundstages, included sets by Dee Dee Bridgewater, Jacky Terrasson, The Blue Note Allstars, James Moody, Marlena Shaw and Kenny Barron.



MUSICIAN PHOTOS LAURENT MACAIRE

Clockwise from left:
Grover Washington, Jr.; Title page
for The Cable Jazz Channel;
Wynton Marsalis on trumpet;
Ramsey Lewis on the piano;
Robert Jackson on the Record Plant
Remote API console



The audio feeds from the stage are split to the house, a video truck and an audio truck—either the Record Plant Remote or D.C.-area mobiles Sheffield Audio and Big Mo. Tracks are recorded to two 24-tracks or one 48-track recorder. (Jackson prefers analog at 15 ips with Dolby SR over digital multitrack recording.) However, Jackson does not master from the multitracks; rather, he takes the mixed signal directly from the audio truck's board and masters to a time-coded Sony 7030 DAT, which is later dumped to an Avid system for picture editing.

"Unless there's been a major problem, we do not do a post-production remix," Jackson says. "We used to bring the artists into the truck to listen to playback of the soundcheck, but that got to be more trouble than it was worth, because it reinforced for the artists that there was the opportunity for remixing, which they will naturally want to. And I feel that a remix for this type of show takes away some of the live

aspect."

Jackson did not arrive at this approach capriciously. "I compared several of the shows on which we did remixes to the original live-mixed tapes, and there was not enough difference to justify the time and money," he says. "This is especially true when you're working with the high caliber of artists we get coming through here, who do not need a lot of post-production help to sound great. And I pick audio people I have confidence in to get it right the first time. We have the multitracks as backup in case there are problems, and as archives. Down the road, we could make deals and reissue the material from the multitracks

onto whatever medium is in use at that time."

Jackson's choice of DAT as the mastering medium was dictated by practicality. "When we started, the jury was still out on modular multitracks as far as being reliable as a mastering medium, and I felt more comfortable using a Sony 7030 timecoded DAT," he says. "Besides, I didn't need the eight tracks to marry to video; the interviews and performances are all self-contained." Post-production generally consists of nothing more than laying in sweetened applause tracks and some voice-overs, surround-sound mixing is planned for the near future. All BET programs are final-mastered to digital Betacam. (The Cable Jazz Channel is carried on Galaxy 7, transponder 21; BET is transponder 20.)

Doing television audio has its special demands, to which Jackson attempts to be as sensitive as possible. "Aesthetics is always a problem doing sound for video," he says. "I'm always fighting

—CONTINUED ON PAGE 106

—FROM PAGE 102, SOUND FOR FILM

still mag used solely for the purposes of interlock dailies, whereas at other times there's no mag or workprint at all, with the picture coming from a negative-to-tape transfer.

The constant variable (?) here is the telecine process, one which contains many minefields for the unsuspecting, even when it involves already-synched picture and worktrack. "How can this be?" you might ask. Each telecine bay involves varying amounts of video delay due to processing (such as noise reduction) between the scanning device and the videotape recorder. A good facility will have quantified said delay and will adjust sound accordingly, either by off-setting start marks or with a digital delay line (the latter of which is fine for dailies, but I would be wary of doing any sort of mastering this way). But many facilities don't take this into account, and you can conceivably leave telecine with all of your audio 1.5 frames ahead of your picture—this when what you delivered to telecine was dead-nuts in sync with start-marks on mag.

At least the above example would result in a constant, quantifiable error that could be corrected. A more sticky prob-

lem occurs when transferring sound to picture either during or after telecine, most frequently by reading timecode numbers on slates. There are many variables, not the least of which is the 30 fps video/24 fps film speed dilemma and the fact that there are often subjective decisions being made by people reading blurry timecode slates in the middle of the night. (Or, perhaps even worse, by an assistant editor synching dailies to a none-too-sharp digitized image.)

The net result is that a take which is digitized out of sync will stay out of sync forever, unless a sharp-eyed dialog editor puts it back in sync. Thus, here in 1996, you have some of the biggest pictures being cut by some of the most experienced picture editors and tracks are coming to sound editorial OUT OF SYNC. No longer can sound editorial teams assume the edited worktrack is a reliable sync reference, and this must stop!

- Use timecode in the field, including timecode slates. Yeah, I know some camera crews piss and moan about the extra trouble it takes to use electronic slates, but they will give you (and as a result, us) a definitive way of checking that your production (aka, source or Nagra) timecode for a given frame is the same in the system's database as it is on the picture image.

And, of course, always use nondrop timecode. Shoot on sight anyone who tells you to use drop-frame.

- Give us printed timelines. CMX-style EDLs are great for telling software how to auto-assemble material but are a pain in the ass to read, not to mention that they're in timecode form, and many of us only think in terms of feet and frames. If you can, please print out a timeline on your system that will show a graphic representation (in both footage and timecode counts) of what scene and take is used at any given point on either Video or Audio 1-4. It's a clear way of showing how a reel is assembled, much in the way an analog watch is better at showing you that you have 11 minutes to go before the hour.

With regard to other paperwork, ask assistant sound editors how they want to receive cut lists and change lists. It's very possible that they will want it on disk, all the better to make custom printouts if they're so inclined (which will save you time, of course).

- Use good speakers. Don't accept the crappy little white speakers that are rented or sold with many nonlinear edit systems. Courtesy of the world of home theater, there are many high-quality

shielded speakers available that will give you a much better clue as to what's on your track.

- Digitize your picture at the best resolution you can afford. While picture resolution would seem to be out of the domain of sound folks, it becomes a serious issue when you expect us to cut against it for temp dubs. I put a clause in my contracts that specifies quality regarding digital outputs: If it ain't good, there has to be a telecine of a conformed work picture. The primary downside of this is that it lengthens the time between the lock of a new version and the start of sound editing; for temps, a day can be a *long* time.

- Talk to the production mixer. Let him or her know that you will crucify them for using EQ before you will crucify them for having too much low end on the track during dailies. Be clear on the instructions for combining 2-track material during the printing of dailies.

- Document what sound effects you cut into your worktrack. Those of us on the sound end can start the procedure when we first send you effects to cut in. You should never receive from us a DAT that says "gunshot"; it should always be accompanied by a number tracing it either to our master library system (the preferred method), or at least to a film-specific number that is cross-referenced to the original library number.

And you in turn should digitize it under said number so we will know, when cutting sound for temp dubs, what effects we should take from your worktracks and which ones we need to cut ourselves.

- Lay out your tracks with care. Since it's so easy to cut tracks on nonlinear edit systems, there's a tendency to spread things out, making it hard to sort through everything during dialog editing. A big help would be to have tracks 1 and 2 containing sync production track only. While the dialog editor would want access to both tracks individually to see your edit points exactly, virtually all other uses of the worktrack (such as Foley editing) can use a combine with no compromise; this would not be the case if the crowd walla that you cut for your scratch temps was on track 2 and would muddy everything up.

Please keep music and effects on tracks 3 and 4, and keep them in mono to save track space.

- Picky technical stuff. Unless you're doing a rough scratch mix that is going to be transferred to mag for a screening, don't ever EQ anything

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"The classic 8's EQ is totally brilliant!"
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Electronic Musician
Magazine,
January 1996



When it comes to choosing the right 8 bus mixing console, certain things need to be carefully considered. It may start with features and price, but sound quality and performance will most certainly be the deciding factors. The award-winning Mixdown Classic has all the features you want plus superb audio specifications, proven reliability and the performance you need. All this at a groundbreaking price for consoles in this class.

To prove our point, the Mixdown Classic 8 recently ran away with Electronic Musician Magazine's Editor's Choice Award for Best Recording Console for 1996. It was also nominated for a TEC Award and has received nothing but critical acclaim worldwide. The Mixdown Classic 8 provides features not found on consoles in this price range, such as its comprehensive MIDI muting system, internal modular design and an optional meter bridge.

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---Michael P. Barton, Appleton, WI

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boards and electric bass Jackson uses Countryman DIs. The Sanken CSS5 stereo shotgun mic is used to cover the audience.

Effects treatment can vary significantly, depending on the artists. "I don't like to do a lot of radical processing with jazz, but generally I like to put some 'verb on vocals and some delay to fatten it up a little. I use a little reverse gate on the snare to give it some slap. With fusion, obviously we do more, but the pure jazz I like to leave as pure as possible," Jackson says.

Jackson uses a TC Electronic M-5000 or an Eventide H-3500 for all-purpose digital effects; a Sony D-7 or a Yamaha SPX1000 handles delay. His favorite compressor is the UREI LA-4; he also uses Summit tube gear, Drawmer and dbx 160s.

Cabling is mostly Canare. "I like the quad Canare, with its four conductors;

two for plus and two for minus, and a shield," Jackson says. "With this cable, however, the two conductors for the plus and minus have to be cut to the exact same length for optimal signal passage.

"Tapewise I like Ampex 456 for multitrack, usually on a 10-inch reel. I like Sony Pro DAT tape; however, if I have a higher budget, I'll go to Apogee," he says with a chuckle.

The next audio production phase for BET and The Cable Jazz Channel is the debut of their own combination audio-video truck, which is currently being built to accommodate a 48-track DASH machine, which BET will rent per-use initially. Built-in gear will include 48 tracks of DA-88 and an SSL 8000 GB console. The truck is expected to be ready late in 1996. "Our truck will be similar to Unitel's black or red trucks. This spring's run of tapings will probably

be the last time we'll hire an outside audio or video truck," Jackson explains.

"The increased production demands brought on by The Cable Jazz Channel was the main driving force behind BET getting its own truck," he adds. "Another motivating factor is that if we ever have any down time, which right now I don't see happening, we can rent it out and make some money! I will miss working with audio only trucks like Big Mo, Record Plant Remote and Sheffield because it's great to work in a space totally devoted to audio. We were able to get the real estate we needed in order to get good sound, pretty much dividing the truck down the middle between audio and video. I think it's going to be a great truck to work in and will produce some wonderful sounds." ■

—
Eric Rudolph is a freelance writer living in Manhattan.

NOTEWORTHY EFFECTS

by Loren Aldrin

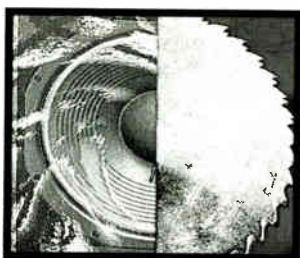
When you ask sound designers or editors to explain how they created some of their favorite effects, you immediately place them in a predicament. First, they're usually so consumed with their latest project that they have a hard time remembering anything else. Second, the effects they're most proud of probably have more than just a few trade secrets attached, and they're hesitant to share them with the world. A magician never explains a magic trick—does a sound designer/editor reveal the inner workings of a complicated effect?

It turns out that some sound designers are eager to share their experiences with those curious enough to ask. We spoke with three such sound craftsmen, exploring how they created some interesting and unusual effects. Dean Beville, sound supervisor at Creative Cafe (Los Angeles), has worked on such movies as *Alaska*, *Supercop*, *Showgirls* and *From Dusk 'Til Dawn*. Paul Berolzheimer is a freelance sound effects designer and editor whose credits include *The Lion King*, *Speed*, *The Net* and many others. Harry Cohen has done sound design for such movies as *The Mask*, *Dumb and Dumber*, *Disclosure* and *The Island of Dr. Moreau* and is now lead sound designer at EFX Systems (Burbank, Calif.).

CREATURE FEATURES

In the movie *From Dusk 'Til Dawn*, Beville and his team had to find a way to bring vampires to life. Their goal was to give each creature its own unique "voice," while keeping moments as scary as possible. "For the vampire vocals, we decided to attack them organically," Beville says. "We used a unique animal sound 'palette' for each vampire, to establish a real character for each. We started with base recordings of lion roars, Kodiak bears, puma snarls, wolves, hyenas, alligators, snakes and other reptiles. We then did tight-sync ADR performances

for each vampire, recording synched grunts, attack snarls and other sounds. After extracting the sync from the ADR, we took the sonic envelopes from the ADR vocals and mapped them onto the animal sound effects. If you had a character that was laughing, and mapped that performance onto a lion roar, you'd have a lion laughing. We were able to take the performance—the communication that drives the story—and apply that to the sound effects. The end result was much better than cutting the ADR live. It was scary, big and nasty—just what the director wanted."



During sound design for *The Island of Dr. Moreau*, Cohen learned that it was possible to succeed too well. In this movie, a scientist populates an island with speaking, intelligent half-human/half-animal creatures. "When we first started the project," says Cohen, "I thought my ultimate accomplishment would be to make speech sound like an animal was actually talking." After experimenting with vocoders and other pitch-shifting software solutions, Cohen found that the Symbolic

Audio Kyma digital signal processor came the closest to really making the animals talk—too close, it seems. "The Kyma has a 64-pole time-variant filter, which will create a template from the words you feed it and impose that template on the animal source. Sure enough, it sounds like an animal speaking words. The effect is interesting, startling, even understandable. And it's unacceptable.

"Turns out, most people have enough trouble paying attention to a character in a movie if he has even a thick accent," Cohen continues. "Imagine if there was a leopard in the room that was magically able to talk—the sound would be so different from the usual context you're used to putting speech in. You'd find the sounds so distracting that you'd miss most of what he's saying. We're really specific about how we perceive speech, and talking animals just sound too strange. And if you're talking about a dramatic performance, you don't want to alter the sound so much it becomes unrecognizable.

"Instead, we decided to push the vocal sounds just a little

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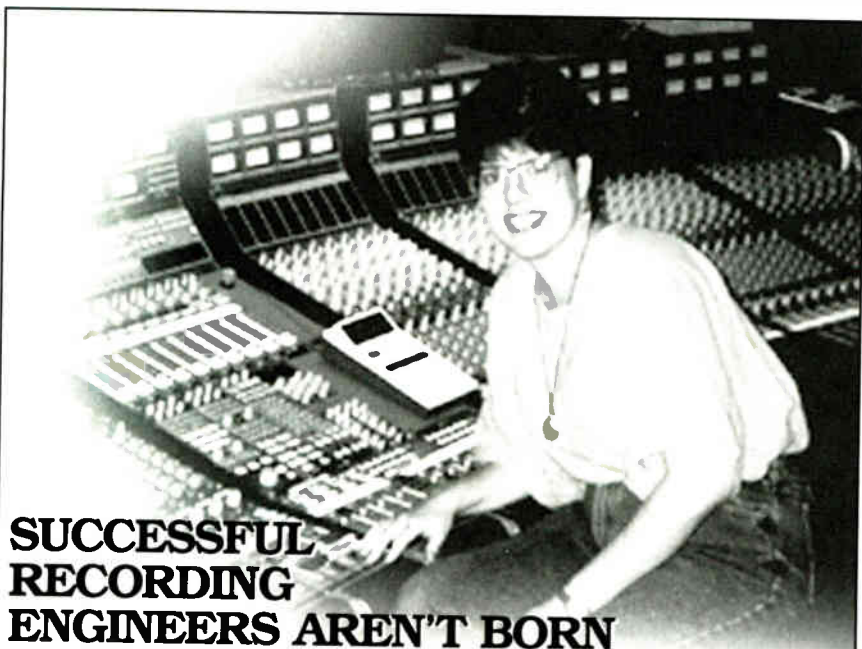
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off-center," says Cohen. "The solution came from a variety of directions—what happens between words, overlays with-in the dialog and very special voice talent. The end result wasn't as dramatic as I'd first imagined. It's a real tough thing to make the point without destroying what the director worked to get out of the actors."

"For flying bat elements in *From Dusk 'Til Dawn*," says Beville, "we had great success with squeaks from different types of door hinges. Various-sized hinges gave us squeaks and chirps at different pitches. The squeak you get from wiping dry glass also worked well; something you'd hear as a bat sound might actually be the rubber ball from a computer mouse being dragged across the face of a computer monitor. We took these sounds and multilayered them, thickening them up with an Eventide Harmonizer and some TDM effects. We then washed them through a Lexicon PCM-80 processor to give them some room. We got a nice thick bed of bats, thousands of them, chirping and flying about. Because we applied the effects, we were able to preserve the aural perspective when we went to the mix. Given the nature of the dub schedule, there really wasn't time to experiment with effects at the dub."

DIFFERENT DIMENSIONS, DIFFERENT EFFECTS

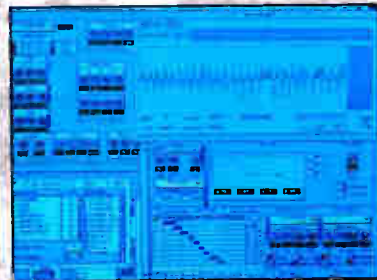
"In a low-budget science fiction film I recently finished," says Berolzheimer, "we needed a sound for scenes where characters traveled to different dimensions. At the heart of these sounds were noises made into a 6-foot-long PVC pipe with a microphone stuck in one end. Some of the noises were mouth noises, resonances from swinging the pipe through the air, scraping the pipe and scraping pieces of metal in front of it. We did multiple layers of different sounds and then processed them through various outboard gear. I have an old Moog 12-stage phase shifter that I used on the sounds, as well as some fairly radical EQ. I did a lot of multiple layers with long delays on almost infinite decay, so they would repeat the sound over and over. I built up all these layers, recorded them off to DAT, then selected which sections to use."

"We did an interesting thing on *Alaska*," continues Berolzheimer. "There are lots of scenes in the beginning of the movie with a small plane flying in and among huge mountains and glaciers. For these scenes, I used two different sets of airplane sounds—one was a

POWER TO SPARE . . .

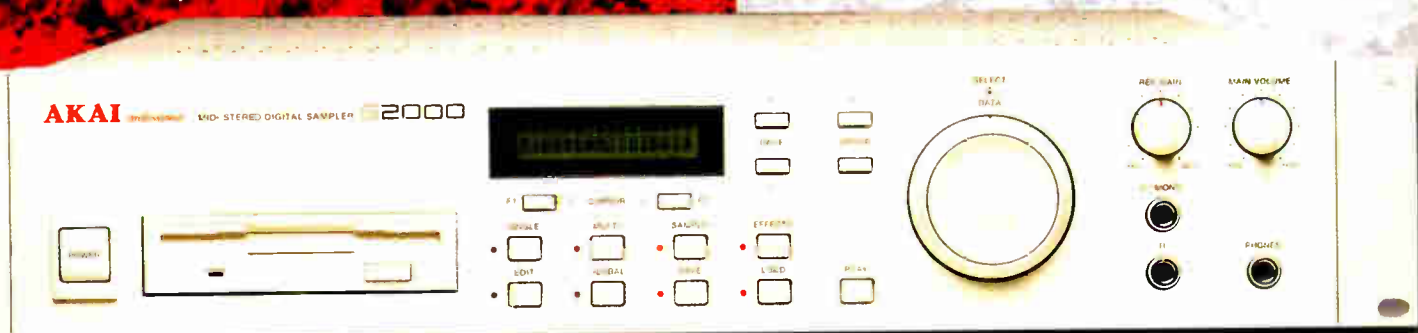
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more constant perspective, fairly close to the airplane, with good engine and prop noise and some variation in the engine revs. The other sound was more distant. For each shot of the airplane, we used an appropriate blend of the two sounds. We used the closer one for the primary sound of the airplane, and brought in the distant one as the plane came close to the mountains and the glaciers. This created the reflections of the airplane sound coming back off the surface, an effect that played really nicely. It gave a realistic sense of perspective on the airplane, because you could hear the natural echoes.

"For a lot of the computer sounds in *The Net*," adds Berolzheimer, "we ran a microphone through a chain of delays and harmonizers, pointed it at a speaker, and moved it around to get different types of feedback through the processors. That made up the basis of many of the data 'whoosh' sounds used in the movie."

"In *The Mask*," says Cohen, "we did a lot of tests to get the perfect sound for when the main character spins and moves from place to place. We tried wind and other sounds, and nothing satisfied the director. So we went to the Foley stage and started from scratch. We twirled garden hoses, power cables and a whole bunch of stuff to get good 'moving through the air' sounds. I took the spinning sounds, put them into the Synclavier, pitched them and layered them, and played a handful of them at one time. I routed these sounds through a speaker and took a mic and waved it in front of the speaker to get the characteristic Doppler phase-shift sound. Then we added jets, fire whooshes and pitched-up wind gusts to move him around. In the end, there was a layer of eight elements to make up the spinning sound—four made [Jim Carrey] spin, and four moved him from place to place.

"To build up massive backgrounds and eerie, tonal ambiances, we've used the Lexicon D-Verb's 'infinite' reverb program," says Beville. "Because this reverb is an additive process, the sound will slowly evolve and change as new elements are added. A rocking chair squeak, for example, will sustain out for a whole scene. We'd wash over the tail end of a gunshot to get a tunnel ambience, or a canyon-like trail-off. These effects played really well in the finished film."

Loren Alldrin is a Nashville-based freelance audio and video producer.

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Alex Marcou - Abbey Road Studios (House recording engineer) - "The Vi-1 makes hard sounding digital sound like cosy, rounded analogue - a joy to listen to. The control that the EQs, Pre Amps & Compressors give is excellent."



Andy Jackson - Pink Floyd (Sound engineer) - "All the lead vocals on the 'Division Bell' album mix were run through the EQ-1 - I certainly prefer the EQ-1 to other Valve Equalisers for vocals. The new EQ-2 is probably the best all-round EQ I've ever used."



Chris Porter (Producer - Take That) - "I bought one of the first EQ-1s and I've enjoyed using it immensely. It gives a unique quality to the vocals in particular - Take That's 'Back For Good' is a typical example of the EQ-1 adding oomph and presence to a vocal track."

Tom Lord-Alge (Dual Grammy Award Winning Engineer) - "The Indigo 2011 EQ has given me the ability to EQ with clarity, rather than just tone. I find it to be very musical. Any problem sound I have come across, I patch in the 2011 ancult allows me to add depth and clarity."

Stephen Croes (Producer, Arranger, Engineer) - Fleetwood Mac, Kenny Loggins, Jennifer Warnes - "The Indigo 2011 EQ and 2021 Compressor are exceptional - both responsive and flexible. I can stomp or be subtle, hear a sound or just detail it. These are real tools for any level of music production."



NEW PRODUCTS FOR FILM/VIDEO SOUND



AKG D230 ENG MIC

AKG (Canoga Park, CA) introduces the D230 dynamic microphone, a high-output omnidirectional mic engineered for maximum intelligibility and low noise. Designed primarily for ENG applications, the D230 features an integrated windscreen, cast metal housing and shock-mounted capsule, an extra-long 8.5-inch shaft and a frequency response of 40-20k Hz.

GEFEN TSE AND ADB

The TSE and ADB Series from Gefen Systems (Woodland Hills, CA) enable Macintosh users to switch between two or more different computers using one keyboard and monitor. The TSE sender and receiver boxes allow keyboards and monitors to be set up as much as 500 feet away from their CPUs, improving security and preserving studio space. As many as four CPUs may be linked to one keyboard and monitor, and two monitors may be linked to one CPU, as in DAW-based post-production applications. The TSE and ADB series are compatible with DAWs from Avid, Digidesign, Sonic Solutions, Studer, Dawn and others. TSE100 S/R and TSE150 S/R systems, which include send and receive units, are priced at \$495 and \$595 respectively. The ADB100 sender and receiver is \$295.

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STUDER POST:TRIO VIDEOMIX™

Studer Editech (Redwood City, CA) has added nonlinear video capability to its Post:Trio digital post-production studio. Post:Trio allows from eight to 24 tracks of digital audio recording and playback and features moving fader automation. It can now record video direct to hard disk, ensuring complete lock between audio and video in Scrub, Shuttle and Play modes. VideoMix™ records variable-quality video, from online to draft, and Studer's video engine is QuickTime-compatible.

Circle 191 on Reader Service Card

TASCAM TIMECODE DAT

Tascam (Montebello, CA) debuts the DA-60 MkII synchronizable four-head timecode DAT recorder for film and video post applications. Among the enhancements to the original DA-60 platform are an improved servo system, better noise and dynamic range figures, and increased audio quality thanks to next-generation A/D converters. The DA-60 MkII has a built-in chase lock synchronizer that supports



Sony P2 protocol, enabling the DA-60 to behave like a VTR. The improved servo system allows continuous timecode recording in the Assemble mode and also allows for jam sync recording of timecode.

The new A/D converter uses 64x oversampling 1-bit Delta-Sigma technology; the D/A converter is 8x oversampling 20-bit Sign-Magnitude type. Price is \$6,499.

Circle 192 on Reader Service Card

BRAINSTORM TIMECODE ANALYZER

The SA-1 timecode analyzer from Brainstorm Electronics (distributed by Audio Inter-visual Design) is a portable unit that identifies timecode format (24, 25, 30, 30DF)



and monitors its phase with video. Front panel displays show timecode or video phase and frames per second, and a beeper alarm sounds when errors are detected. The unit can be powered with a 6VDC bat-

tery pack for location applications, and a rear panel serial port allows for comprehensive report printing. Price is \$895.

Circle 193 on Reader Service Card



CALREC RETURNS TO U.S. WITH BROADCAST MIXERS

Absent from the U.S. market for some years, Calrec Audio Ltd. (Yorkshire, England) has returned with a broad range of audio mixing consoles for broadcasters. The Calrec T Series is a digitally controlled analog console that provides four inputs

per channel and has dynamics available on all channels, groups and main outputs. Automation and memory functions are under PC

control, allowing offline editing, and recall and reset parameters can be stored in 100 locations. The Calrec S Series console is available with up to 72 channels and features two mix-minus outputs per channel, eight stereo groups, 32-track multitrack routing, ten aux buses and comprehensive monitoring and communications facilities. The Calrec Minimixer II is a rack-mountable unit available with up to 24 channels and four stereo or mono groups.

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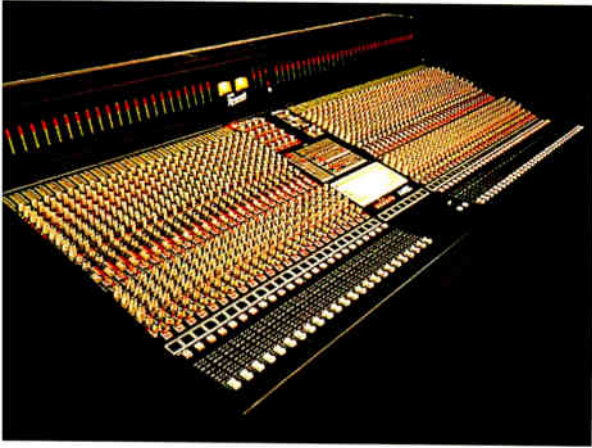
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PREVIEW



AMEK REMBRANDT

Amek (North Hollywood, CA) announces the Rembrandt, its newest automated music and post-production console. Available in 40- or 56-input frame sizes with onboard or external patchbay, the dual-path architecture provides 80 or 112 inputs for mix-down, each with identical four-band parametric EQ. In addition to 24 output buses, the Rembrandt offers 16 aux sends and direct outputs from each module. Mic pre circuitry is similar to that on Amek's Angela console and features discrete arrays of transistors. Amek Supertrue VCA fader automation is standard and incorporates Recall, Virtual Dynamics, and Visual Effects functions. Prices range from \$114,352 for a 40-channel model to \$146,895 for a 56-input board.

Circle 226 on Reader Service Card

HARRISON SOFTWARE UPGRADE

Harrison by GLW (Nashville, TN) announces Version 3.2.0 software for

the SeriesTwelve/MPS automated consoles. The 43 new features in V3.2.0 include the SmartStart™ architecture, which provides seamless transitions after interruption or during recovery of the automation mainframe; and the SmartStick™ motorized panning joystick with graphic control, offering fully automated control of multichannel panning within any speaker format. Version 3.2.0 is available to existing Series Twelve/MPC customers at no charge.

Circle 227 on Reader Service Card

DIGITAL LABS ADAT UPGRADE BOARDS

Digital Labs (Cape Girardeau, MO) announces new pricing on its Solution Series of Alesis ADAT upgrade cards. The replacement input and output boards can be installed in minutes and are now priced at \$349.95. The input board adds 1/2-inch balanced input capabilities, automatic input impedance adjustment and full volume control for EDAC and 1/4-inch input sec-

tions. The output board can drive 50ma outputs (a 100ma option is available), and the 1/4-inch outputs can drive professional levels, eliminating the need for EDAC connectors.

Circle 228 on Reader Service Card

REMOTELY CONTROLLED MIC BOOM

The Sonic Boom from Studio Techniques (Danbury, CT) is a remotely controlled studio mic boom that allows an engineer to reposition microphone(s) without leaving the mixing console. Suitable for recording, broadcast and live sound applications, the Sonic Boom is similar in concept to Studio Techniques' Positioner product. Price is \$349.

Circle 229 on Reader Service Card

MARANTZ CD RECORDER

The Marantz Professional CDR620 CD recorder (distributed by Superscope Technologies, Aurora, IL) is a rackmount write-once compact disc recorder completely compatible with Red Book and Orange Book specifications. The unit offers comprehensive analog and digital I/O (including AES/EBU and IEC-958-II interfaces); a SCSI-II interface enables transfer of data in CD-ROM (XA), CD-Photo, CD-I, Video-CD and CD-DA formats, and also allows the CDR620 to be integrated with a DAW system. Features include adjustable digital fade, auto track incrementing and indexing, and audio delay. A cascade function allows parallel op-

eration of multiple units. A 34-key wired remote is provided and a 9-pin GPI interface facilitates external automation. Price is \$3,600.

Circle 230 on Reader Service Card

EQUI=TECH AC POWER SYSTEMS

Equi=Tech Corporation (Selma, OR) announces a new line of turnkey, balanced AC power systems to ease installation of clean power. Available in 5KVA, 7.5KVA and 10KVA (50, 75, 100 amp) configurations, the systems meet 1996 National Electrical Code standards and feature a precision balanced toroidal isolation transformer, industrial breaker distribution, electrostatic shielding, double-isolated internal chassis, and transient voltage and ground fault protection. The company claims that a typical system can lower the noise floor by as much as 20 dB and can eliminate buzz and hum completely.

Circle 231 on Reader Service Card



PREVIEW

BENCHMARK A/D CONVERTER

The AD2004 from Benchmark Media Systems (Syracuse, NY) is a 4-channel, 20-bit A/D converter with outstanding low noise and jitter specs. Intended for 20-bit-plus recording environments, the unit does not include a DSP for re-dithering to 16 bits. Supplied standard in either a 44.1kHz or 48kHz version for \$1,795, a unit is available with both sample rates for \$1,995. All units include a Varispeed mode for sampling at any rate between 28 kHz and 54 kHz. Front panel LED meters feature coarse and fine scales and selectable peak hold; individual channel sensitivity is screwdriver-adjustable.

Circle 232 on Reader Service Card



CAIG DEOXIT MINI-SPRAY

CAIG Laboratories (San Diego, CA) now offers its DeoxIT D5 deoxidizer fluid in a pocket-size 15g mini-spray. DeoxIT dissolves oxides and sulfides that inhibit conductivity, and prevents dissolved oxides and contaminants from reattaching to metal surfaces. Designed to clean, preserve, lubricate and improve conductivity on all metal connector and contact surfaces, DeoxIT is also available in non-aerosol pump spray.

precision dispenser, pen applicator and as wipes and bulk liquid.

Circle 233 on Reader Service Card

BASF HI-8 MASTER CASSETTES

Digital Master 936 Hi-8 cassettes from BASF (Bedford, MA) are available in 60- and 113-minute formats and are designed specifically for 16-bit digital recording applications. DM 936 metal particle tape is manufactured to stand up to the stress of takes, retakes, pauses and repeated track jumping.

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RE'AN PATCHLABEL SOFTWARE

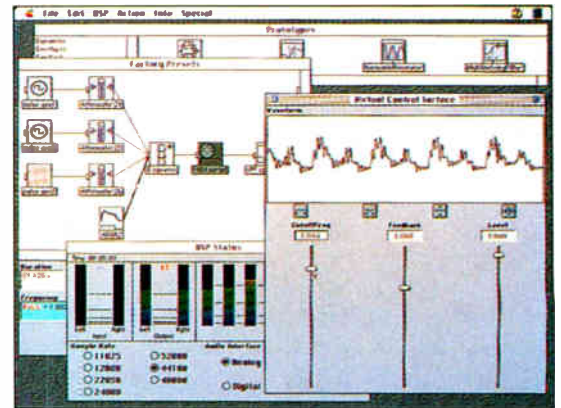
Re'an Products (Fairfield, NJ) has upgraded its PatchLabel software for Windows (a Macintosh version is in the works) and dropped the price to \$79. PatchLabel simplifies the creation of accurate and legible labels for a wide range of standard patchbays. Version 2.1 is easier to use and includes a library of templates of patch panels from major manufacturers.

Circle 235 on Reader Service Card



Z-SYSTEMS DIGITAL PARAMETRIC

The z-q1 stereo digital four-band parametric EQ from Z-Systems (Gainesville, FL) incorporates a 32-bit floating-point DSP and is capable of handling 24-bit inputs. Filter bandwidth is



KYMA SOUND DESIGN 4.1

Symbolic Sound Corporation (Champaign, IL) has upgraded its Kyma sound design workstation software to Version 4.1. New features are tools for performing spectral analysis and creating user-defined tuning tables, and a MIDI scripting language. New synthesis modules include time-varying filter banks derived by analyzing voice or instrument samples, and an additive synthesis module that relies on 3-5 oscillators with complex waveforms rather than hundreds of sine wave oscillators. A multfile disk player enables MIDI triggering of stored audio tracks for almost unlimited sample lengths.

Circle 237 on Reader Service Card

TC ELECTRONIC FINALIZER

The Wizard Series Finalizer from TC Electronic (Westlake Village, CA) is a digital dynamics processor for mastering applications.

adjustable from 0.4 to 8.0 and there are additional high and low filters. The z-q-1 has an analog-style interface with detented knobs, but works entirely in the digital domain (AES/EBU in and out). A variety of dither options to control output word width (16-, 20-, 24-bit) include Apogee's UV22" Super CD Encoding Process, which captures 20-bit resolution on the 16-bit CD format. The z-q1 offers 80 EQ recallable presets; an optional snapshot automation package for Mac or Windows allows users to reference EQ settings to timecode and download them automatically.

A mastering version, the z-q-1m features a complete

set of displays for each of the EQ bands. Pricing begins at \$3,800; UV22" and timecode options are extra.

Circle 236 on Reader Service Card



PREVIEW

Based on the successful Wizard M2000 and its intuitive user interface, the Finalizer features a large LCD readout that shows signal flow and all effects in use. Factory presets include a five-band stereo parametric equalizer and three-band stereo compressor/limiter/expander, all with extensive control parameters. Featuring 20-bit A/D converters, 16-bit dithering and HP-TDF noise shaping tools, the Finalizer also includes a

normalizer to ensure optimum signal levels at the AES/EBU and S/PDIF outputs. Analog I/Os are XLR balanced, and remote-switch 1/2-inch and MIDI connections are standard.

Circle 238 on Reader Service Card

CUBASE 3.0 FOR POWER MAC

Steinberg North America (Chatsworth, CA) announces Cubase 3.0 for the Power Macintosh, featuring Virtual Studio Technology



(VST). VST incorporates up to 32 tracks of CD-quality digital audio, up to 128 EQs

in real time, total automation, a virtual effects rack featuring four multi-effects processors and an interface that provides access to external audio processing devices from other vendors. No extra hardware

is required. Price of Cubase 3.0 is \$349.

Circle 239 on Reader Service Card

HOT OFF THE SHELF

SoundTech's new 32-page catalog includes specs and product info on its line of speakers, amps, mixers, signal processing and accessories. For a free copy, call 800/877-6803 ext. 292...Selco offers its extensive range of knobs in thousands of custom colors. Colors may be specified by referencing the Pantone Matching System or by providing a color sample. There is a 5,000-piece minimum order. Call 800/229-2332...Microboards has reduced prices on its PlayWrite CD-recordable systems: PlayWrite 2000 (2x) is now \$1,195; PlayWrite 4000 (4x) is now \$1,995. Both systems include premastering package software on CD-ROM for Windows, Macintosh and UNIX environments. Call 800/646-8881...Yamaha announces new prices for its CD Expert family of CD recorder/players. At \$769, the internal CDR102 (2x record/4x playback) is now among the lowest-priced CD recorders available. The externally mounted 2x/4x CDE102 now costs \$859. The quad speed (4x/4x) CDR100 (internal) is \$1,149, and the quad speed CDE100 II (external) is \$1,249. Call 408/467-2300...Sound Identity's 30-CD Centennial Olympic Games Music Library includes a computerized search engine that allows producers to select music according to mood (bittersweet, celebration, disappointment, etc.) and preview ten-second clips. The library also includes recommendations for matching music to events and associates types of music with Olympic events (water, new age, gymnastics, classical, etc.). Call 212/807-6500...TRF Production Music Libraries' 1996 Tele Music catalog is a collection of separate jingle-length tracks, underscore versions, al-

ternate mixes and short stings. Instrumental combinations range from symphony orchestras to small groups and individual instruments. A small part of TRF's 50,000 selections, Tele Music new releases may be ordered on approval. Inexpensive unlimited-use licenses are available. Call 800/899-MUSIC or fax 914/356-0895 or e-mail to trfemail@aol.com...Manhattan Production Music has added three new CDs to its Apple Trax library. Each of the three CDs—Action, Romance & Comedy, Suspense & News, and Blues & Soul Revival—was recorded by the 18-piece Apple Orchestra of New York studio musicians. Manhattan has also added Sports Effects, a 97-effect collection of sports stings such as golf swings and football hits. Call 800/227-1954 or 212/333-5766...Opcode Systems Inc announced that Open Music System Version 2.1 provides a serial port fix for Power Macintosh and A/V Macintosh users who have experienced problems when inputting high bandwidth MIDI data on both serial and printer ports simultaneously. OMS 2.1 incorporates Apple's serial DMA extension, which facilitates robust MIDI performance. Call 415/856-3333...DigiTech has a new demo CD that shows off the capabilities of the company's Studio Vocalist vocal harmony processor. To order the free CD (there is a \$5 shipping and handling charge), call 800/999-9363...HF Media Solutions AB of Stockholm, Sweden, has developed interfaces for visually impaired audio professionals that allow them to read equipment displays in Braille. HF Media has fitted M5000 and 2290 effects units from TC Electronic with a display reader card that converts the information to ASCII characters that can then be read with a Braille display. Call 805/373-1828. ■

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World Radio History

SIX MIC PREAMPS

LOW-COST OPTIONS FOR THE PROJECT STUDIO

I have a number of friends with project studios. Lately, many of them have been interested in checking out outboard mic preamps that provide better performance than the units found in the typical 8-bus console. To this end, I've put together a demonstration of affordable mic preamps, including several tube models.

Anyone with a \$5,000 mixer probably isn't going to go out and buy racks of Focusrite, Manley, API or GML gear, so the sights were set a little lower. What follows is a representative display of preamps priced from \$349 to \$950.

The contenders are Aphex, dbx, Bellari/Rolls, Groove Tubes and Peavey. Also included is a small preamp circuit, manufactured by Audio Upgrades, which is meant to replace the original equipment in some mixers. The device retails for \$100/channel, and labor is \$75 to install it. For this demonstration, they put the preamp in a box with a small power supply and XLR connectors. Finally, as a control element in the demonstration, I added two ringers to the proceedings. First was the Langevin, which retails for \$1,475, and second was a prototype mono unit from Martech that has been demonstrated at various trade shows and will retail for around \$2,200.

Listening tests were made at Frank Day's Ocean Studio in Burbank. Located in a former Chrysler dealership, it's been transformed into a beautiful, warm, open facility. But, as this demo was focused at project studio owners, a Soundcraft Delta mixer was used in lieu of Ocean's Neve. And in place of the studio's large TAD monitors, we used JBL 4410As. The microphone was an AKG 414, a favorite among many project studio owners. A stand-alone AKG phantom power unit allowed the proceedings to move quickly. To ensure fair comparisons, we fed a 1kHz tone into the room and adjusted

each preamp's gain so that they matched exactly.

For the sound sources, we used Dick Monda (male vocals), Nancy Rando (female vocals), Bob Shepard (tenor sax), Alan Steinberger (piano) and Jim Fox (acoustic guitar). These in-demand studio players in the Los Angeles area not only played for the demonstration but offered their comments on the sounds of the devices.

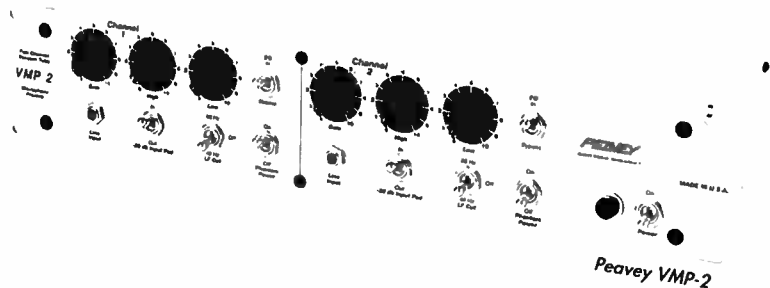
Besides the musicians, listeners included Dave Crigger (author/percussion specialist), D.J. Olsen (composer/orchestrator, who has worked on such movies as *Bat-*

man Forever), Stephen Paul (renowned microphone authority), Craig Garfinkle (composer/orchestrator project studio owner), and finally, my good friend, composer/songwriter Jay Rando.

All the sound sources were recorded to a Sony DAT with Ampex tape, and the evaluations were conducted from this tape. I was told that a DAT would not be able to pick up the fine gradations in some of the preamps, but as most project studio owners don't have 30 ips, ½-inch recorders, I figured DAT would make the most sense. This was a blind test, in that the listeners did not know which

BY GARY WOODS

—CONTINUED ON PAGE 226



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ADB INTERNATIONAL MULTI!WAV DIGITAL PRO

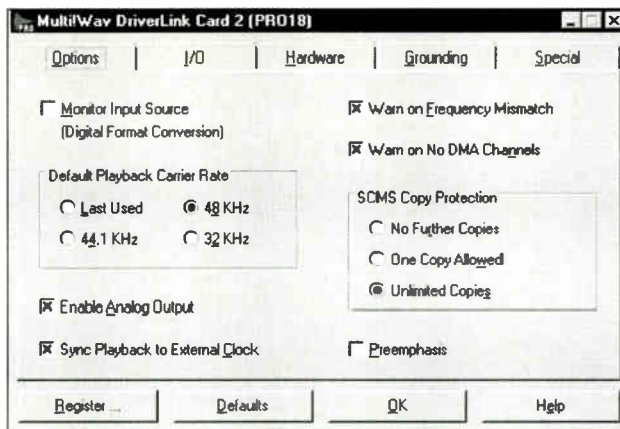
PC SOUND CARD

While the lion's share of audio cards for the PC platform are low-budget "sound cards," there are a growing number of lower-cost professional PC audio products on the market. One such example is the Adb Multi!Wav Digital Pro, distributed by Tracer Technologies, whose principals include ex-Turtle Beach alumni.

Priced at \$549, Multi!Wav is a digital I/O-only product, a half-length 16-bit ISA bus card equipped with AES/EBU, S/PDIF or optical digital I/O. The board does not have any analog inputs or outputs, so you'll need another sound card or external digital-to-analog converters. Those burned in previous PC board installation trials can relax—this card doesn't require any interrupt request lines (IRQs), just a configurable memory address and a DMA channel (two DMA channels are used if simultaneous play and record is desired). The latest driver (available on the company's Website) syncs to external clock and also supports multiple cards in one PC.

A common problem with PC audio boards is their limited rear-panel connector space, which often results in nonstandard or ill-fitting connectors. Further, space limitations usually limit the number of interfacing options provided. Fortunately, that's not the case with the Multi!Wav, which includes not one, but three digital audio I/O formats.

Adb made a practical choice by using 1/4-inch TRS balanced connectors for its AES and S/PDIF digital audio. While those two specs call for XLR and RCA jacks, respectively, an adapter or custom cable makes it possible to interface the Multi!Wav with either format, without resorting to an external breakout box or a custom-wired 9-



The logical configuration of the card is handled via software, so you won't be opening the case to change jumper positions.

pin D-sub connector.

The inclusion of optical digital connections is a feature unique to products in this class. While less common than AES/EBU or S/PDIF, optical digital audio can be found on higher-end consumer, some pro audio equipment and popular tiny DAT recorders, such as the Sony DA-7 DATMan.

In addition to providing for these three digital audio formats, Adb has made extra provisions for the electrical interfacing of the card into your system. Ground loops can cause problems for digital audio interfacing, including increased jitter, according to the manufacturer.

Adb addresses this potential problem by providing flexible interfacing to the Multi!Wav. Electrical inputs and outputs use shielded transformers, and DIP settings on the card allow any combination of signal and transformer shield grounding or ground-lifting, allowing you to adapt the card to the rest of your system.

All the documentation for the product is provided on disk with just a few pages of printed material in the box. While online documentation is convenient, you can't flip through it like a book. Based on my experience with the initial

release, Adb added a sheet showing software highlights to help orient you to the materials. The online help is clear and complete, and the configuration software shows you a picture of the card's DIP settings, a very convenient and thoughtful touch.

The main competition for this product comes from Digital Audio Labs, whose well-regarded CardD series includes products with both analog *and* digital I/O. However, DAL offers RCA-S/PDIF-only, making the Multi!Wav unique in its interfacing flexibility (both from a format as well as grounding standpoint).

Overall, this is a promising first product from a company that previously has been involved in manufacturing medical products. Future plans include a software release to support 24-bit digital audio and additional products, including the (soon to ship) Multi!Wav PRO 18, which adds an 18-bit D/A converter, and a future PCI card with multichannel digital audio support.

Adb International, distributed by Tracer Technologies, 717/843-5833; fax 717/843-2264. ■

Rudy Trubitt is an independent engineer and author whose most recent work is Mackie Compact Mixers, available through Mix Bookshelf.

BY RUDY TRUBITT

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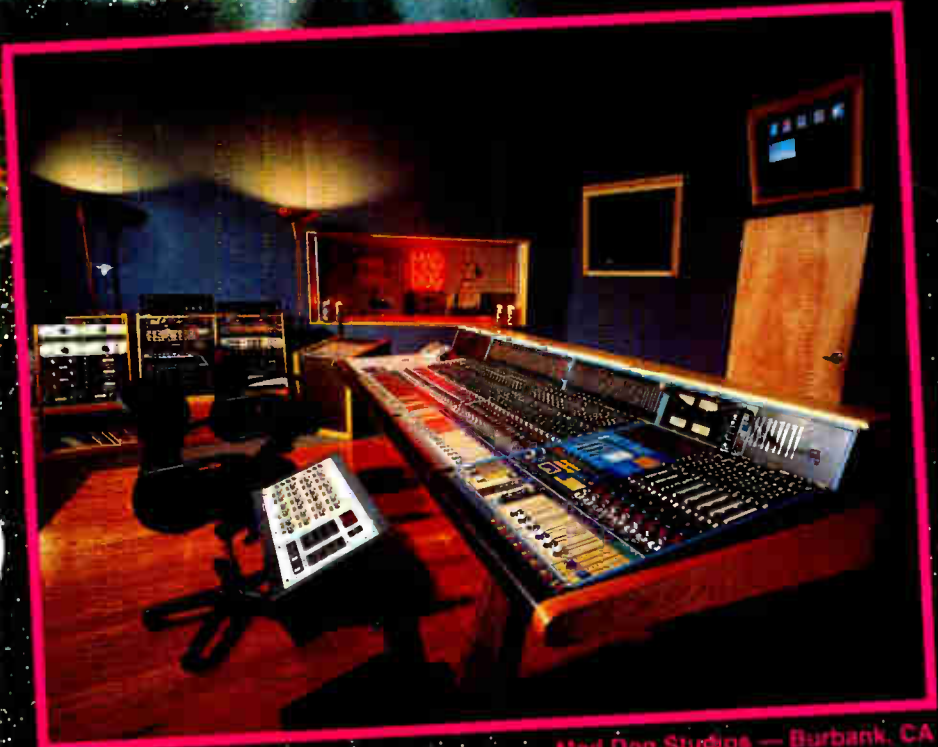


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MEYER SOUND LABS MSL-4/650-P

POWERED LOUDSPEAKER SYSTEM

Last year, Meyer Sound previewed its first self-powered sound reinforcement speakers. The Meyer MSL-4 has the same footprint as an MSL-3, but at three feet tall, it is 20 inches shorter, having only a single 12-inch driver. At 180 pounds, it is 60 pounds lighter and more than equals the punch of the MSL-3 due to improved tuning of the cabinet and the addition of matched amps to the drivers. The MSL-4 is not just a chopped-down MSL-3 with an amp thrown in, but rather a complete redesign. The midrange driver now has its ports on each side of the HF horn. The 12's retuned resonance means it has better excursion control and more efficiency than the double-12s in an MSL-3. The speaker has a tight, controlled coverage of 40° horizontal by 35° vertical, about ¾ the dispersion of an MSL-3, and it drops like a rock beyond that.

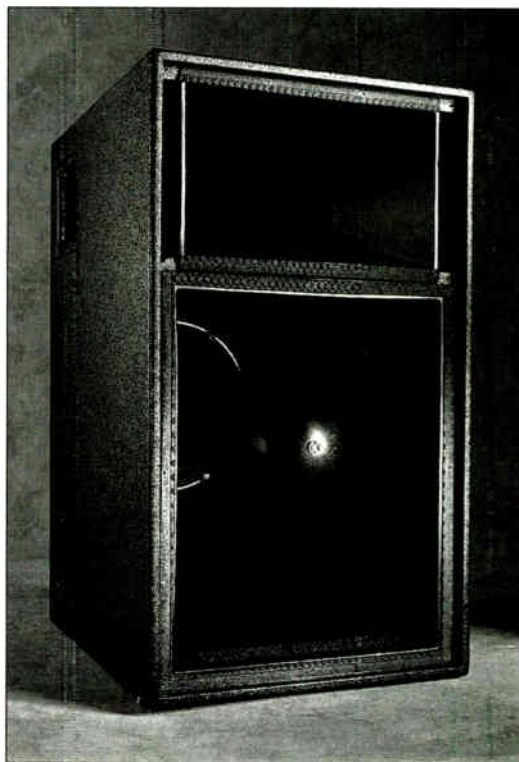
Though the Meyer 650-P subwoofer retains the same dimensions as its predecessor, it weighs 25 pounds more due to the MP-2 amplification and processing module mounted in the back. Before hearing these, my favorite Meyer sub was the USW dual-15. The internal volume of the 650-P moves the tuning up almost a third of an octave from the 650-R2 while maintaining its frequency response profile, resulting in a more musical sound. The 650-P requires less cone movement to achieve the same output as the older subs, keeping the transducer in its linear operating range. This means less chance of hitting the pole piece, more efficiency, lower distortion and a more damped impulse response. The damping factor has, of course, improved because of the proximity of the amp, plus the fact that it's being run as an 8-ohm load, which makes a huge difference in the amp controlling the speaker, instead of the other way around. The economics of external amplifiers force designers to run

subs at 4- or even 2-ohm loading, resulting in the loose low-end response heard in many systems.

The MP-2 amplifier is a derivative of the HD-1's module that Meyer has been manufacturing for six years. It's a 2-channel Class AB/H amp, operating just like the HD-1 module until the last 12 dB, where higher rails kick in, providing up to 620 watts of burst power into 8-ohm loads. Processing cards for each different model determine crossover, EQ, phase alignment and protection for drivers, but because they are matched to the components, there is no need for peak limiters. Indicators are a green power LED and red limit LEDs, one for each driver, lighting up when the amp exceeds the driver's power handling for more than 100 milliseconds.

The amp modules are simple to operate, offering phase polarity, either Pin 2 or 3 hot, as the only user-adjustable parameter on a recessed switch below the LEDs. The input connector is a female XLR, with a parallel male for looping through to another speaker. Intelligent AC™ provides automatic voltage selection and surge suppression, and any normal international AC will power it up automatically. The modules are easier to replace than a traditional amp—removal of eight Phillips #2 screws and disconnecting the Phoenix connector going to the speakers takes about three minutes. The down side might occur if you have to change one once they're flown, but it's much easier than swapping a driver, and both are less likely to need service due to matched amps-drivers.

The benefits of a self-powered speaker system are many. Concerns over matching power amps



to the transducers are eliminated, as is the need for the correct processor, and there's no amp rack to miswire. Design of complex, multizone systems is no longer limited by the number of processors, amplifier channels or even length of speaker cables on hand, as these are all contained within the powered speaker. Designs can be configured into as many different zones as there are speakers, allowing tailoring of individual levels, frequency response and delay times to optimize overall coverage and performance. Elimination of amplifier racks and speaker cabling relieves the shop from constantly having to match up racks and cable trunks for various chores, and new requirements for power distribution and line-level XLR signal distribution are easier to administer and require a fraction of the space. Additional benefits include availability of cross-rental inventory that is inherently compatible. Simplified oper-

BY MARK FRINK

ation for less sophisticated users who need to be able to "plug and play" means systems can be rented without the fear that the customer will rewire the rack or overdrive the system.

The MSL-4 lists for \$8,030, but it is a bargain if you add the full pricing of power amps, controllers, speaker and interconnect cables, amp rack fabrication and labor. The M-3 controller is \$2,300, or \$100 for a speaker cable, \$2,000 for a decent amp, and hundreds each for a rack, the internal fabrication of its wiring, as well as the labor to put it together; call it about \$5,000 additional expense to make the MSL-3 a working sub-system. Of course, by sharing amp channels and processors, the cost of unpowered speakers compares favorably, but all the other advantages of self-powered speakers are lost.

ON THE ROAD

The first test for the system was as sidefills for a James Cotton show at the University of Oregon's EMU Ballroom, and then as a drum fill for a show with Confederate Railroad at the Ross Ragland Theater in Klamath Falls. Both Cotton and CR's drummer are veterans of decades of live sound and require extraordinary monitor levels. Both musicians were thrilled with the sound quality and the levels these speakers produced, and at no time did any of the protect indicators flash. Sound services for these events were provided by George Rellis, who said that because of the directionality of the MSL-4, the speakers performed extremely well in reverberant spaces, keeping more sound in the listening area than with the MSL-3 inventory he normally runs. They require less EQ than a 650/MSL-3 combination and get several dB louder, but the main benefit seems to be the better control of mids and highs, with the drawback being a requirement for half again as many speakers to cover a given listening area.

The system was also used as FOH speakers for the Portland Art Museum's After Hours series. Equal parts entertainment, society happy hour and social event, these events take place in an extremely reverberant ballroom at the Masonic Temple next to the museum. Live music varies from rock 'n' roll or blues to salsa. The MSL-4's 40° coverage pattern allowed us to focus the sound directly in front of the stage onto the dance floor and adjacent listening areas, while conversation-level listening was possible at the rear of the room,

where Northwest wines and hors d'oeuvres were served along with after-work discussions by not-so-young professionals.

The sound quality of these speakers is extremely flat, requiring very little EQ, other than at about 125 Hz, where the subs meet the MSL-4s; a 6dB/octave filter was helpful there. This was verified using the SIM II measurement system, which also confirmed the system's extremely flat phase response above 500 Hz, where pattern control is best. Meyer has released a new product called the LD-1, a multichannel line driver for the new series of self-powered speakers. The LD-1 not only has -12dB to +6dB pots for level control of individual cabinets, but also provides 100Hz or 160Hz low-cut filters for summing more evenly to subs, optimizing the power bandwidth of the MSL-4 and reducing the amount of equalization needed.

Finally, our review system was used as the FOH speakers at the Aladdin Theater, a renovated 800-seat, 1920s-era cinema with a tiny balcony. The Aladdin is narrow and live, with a flutter echo provoked by parallel side-walls. The MSL-4s were helpful in controlling the amount of sound hitting the walls, while covering the last seat in each row. The speakers were used for shows ranging from folk solo acts, adult-contemporary and jazz to full-blown pop music, including Alejandro Escovedo and reggae act Pablo Moses, providing a smooth, natural sound that required minimal EQ. Several visiting engineers remarked on the recording studio quality of the system, comparing the sound to that of their favorite large studio monitors. Meyer could have easily named them HD-4s.

Self-powered speakers mark a new beginning for both Meyer and the live sound industry. The simplicity of setup made them a breeze to install in each case, but the savings of truck space and weight didn't really hit home until a logistical conflict had the bobtail at the wrong end of town at the end of the last show. I was able to fit the entire front end into the back of my Chevy S-10 pickup, the cables in a milk crate in the front seat, and drive off to find the tour truck. Never has so much, for so many, fit into so little space. Just add a good console, some mics, a pile of XLR cables and, *voila*, instant sound system.

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PHILIPS MODEL IS 5022

PROFESSIONAL SOUND ENHANCER

An outboard analog/digital or digital analog converter can make a noticeable improvement in the recording or playback quality of your digital recorder or workstation, particularly for systems that are several years old. Unfortunately, many outboard converters are priced higher than a studio DAT deck, and when you add in the cost of a pair of converters, you may need to get a second mortgage on your SSL before you consider upgrading. With this in mind, Philips offers the IS 5022, a digital outboard processor with 20-bit A/D and D/A converters, priced at an affordable \$2,400.

In addition to its A/D and D/A functions, the 5022 provides a variety of digital domain processing: EQ, sample rate conversion, scratch/noise removal, spatial enhancement, compression/expansion, digital fade in/out and more.

Installation and setup are straightforward. A front panel but-

tonally indicated by the meters. The approach is unconventional, but it's actually easy to use.

When not displaying effect levels, the LED meters indicate input level in 26 steps between -60 and 0 dB. Interestingly, the 5022 has an "overload" LED and a +1dB mark on the meters. Why both? The overload LED operates instantaneously, while the ballistics of the LED meters have more of an analog VU feel.

On the A/D side, input level is adjusted with two front panel gain pots. These continuous controls and small-diameter knobs make it hard to match previous settings, and the pots' taper is fairly sensitive, so a small touch sometimes makes a big difference in input settings. However, the manual includes a procedure for bypassing the pots entirely (via internal jumpers) and using internal trim pots to calibrate the input stage for optimal performance.

example, bass/treble/spatial/fader can be used with either compress-expand or scratch/noise/stereo enhancement.

The treble or bass EQ sections are adjustable in 1dB steps to a maximum of about 9.5 dB. Both are extremely wide Q shelving filters. I wasn't impressed with the bass—it seemed too broadband to add punch to a track, and while it does increase LF energy overall, it also increases the upper bass "boom." A tighter filter, centered in the 80 to 100Hz range, would be much more valuable in a production setting. The treble control, on the other hand, was quite nice, adding a gentle sheen and presence without becoming shrill.

The 5022 includes sample rate conversion of any input from 15 to 50 kHz and will output this to either 44.1 or 48 kHz. No means for outputting to other clock rates (i.e., 22.05 or 32 kHz) is provided, but the SRC function it offers is high-



ton switches the 5022 for analog or digital inputs. Analog I/O can be -10dB (via RCA jacks) or +1dB, with electronically balanced XLRs. S/PDIF (IEC 958) coaxial and AES/EBU XLR digital ports are standard, as is a BNC word clock input for slaving the 5022 to other devices. Both sets of analog and digital outputs are always active, while recessed rear-panel switches select whether the digital input is S/PDIF or AES, and the analog input is XLR or RCA. Ten lighted pushbuttons select the desired effect or function, and 12 LEDs indicate status at a glance. Effects can be tweaked using the +/- adjust buttons; the effect parameter is vi-

Obviously, the primary use of the 5022 is for its converters, and the A/D section is exemplary, providing excellent performance with all types of program material and sources. The D/As are based on the Philips DAC7 and are very good, with excellent soundstage characteristics and a smooth, natural sound. For those interested in high performance, an optional daughterboard improves D/A performance by a couple of dB, but the 5022 is more than acceptable right out of the box.

The 5022's digital effects can be used singly or in combinations. For

quality and useful for most studio chores, such as changing 44.1 to 48 kHz, and vice versa.

The onboard compressor/expander offers only an output ratio control and would be of little use in most pro applications, where more parameter control (attack, release, threshold, decay) is required.

Pros will definitely be more interested in the 5022's click and noise filter features, which are ideal for removing surface noise from 78, 45 and 33 rpm records. Some experimentation to find the optimal click removal is necessary, as this varies with each record. Once this is achieved, the noise fil-

BY GEORGE PETERSEN

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FIELD TEST

ter—actually a second-order (12dB/octave) lowpass filter with cut-off adjustable from 5.5 to 16 kHz—can be used to get rid of any nonmusic HF noise. These features don't exactly equal the power and versatility of a Sonic Solutions NoNoise[™] or CEDAR system, but are surprisingly effective when dealing with scratchy discs.

"Fader" provides automatic digital fade ins/outs, adjustable from 0.5 to 11 seconds. I would have preferred longer fade times—even the 11-second setting seems too short.

The 5022's "stereo enhancement" (stereo from mono) and "spatial" (stereo image widening) functions are useful, but a little of both goes a long way. I found both of these effects more useful on individual tracks than on mixed program material. Interestingly, the "spatial" effect adds a reverberant field to the sound, so if you ever need access to a quick digital reverb, you have it.

One very useful feature is Quantization Noise Imaging, a form of inband noise shaping that works with 16- or 18-bit signals and moves any quantization noise present to outside the audible frequency range. The output result is a 16-bit noise-shaped signal, with improved clarity, particularly in lower-level signals—such as soft passages, reverb tails and fades—where quantization noise is most evident.

Several functions are not listed on the front panel. When passing digital signals, the 5022 also includes SCMS removal, jitter reduction and AES-to-S/PDIF format (and vice versa) conversion. Additionally, when using the 5022 as an A/D converter, both of the digital outputs are active, so it's possible to simultaneously route S/PDIF to one and AES/EBU to another.

Combining a high-quality converter set and many valuable functions, the Philips IS 5022 is worthy of consideration by engineers looking to upgrade the quality of digital audio in the studio. The unit retails for \$2,400, but anyone on a budget could also look into the IS 5021, which offers a similar feature set (minus the AES/EBU ports, analog XLR I/Os and SCMS removal) in a brick-sized package for \$1,500.

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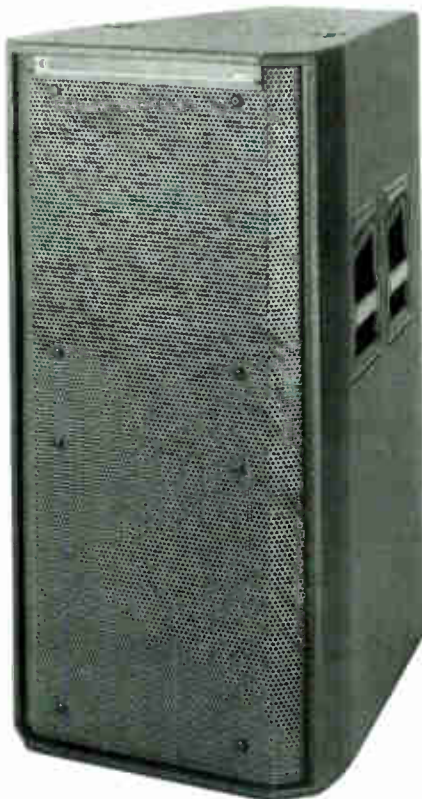
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KEITH STEGALL

NASHVILLE'S MAN OF MANY HATS

Many people thought Keith Stegall bailed as Randy Travis' original co-producer because "On the Other Hand" bombed—well, the first time it was released, anyway. The second time, it took country radio by storm, but by that time Stegall was out on the road with his own thing, relinquishing all Travis' production to Kyle Lehning.

"Warner Bros. had suggested Kyle co-produce with me since he was my producer and I was on the road quite a bit," says Stegall, who had basically made his living as a songwriter. (He has written such songs as "Sexy Eyes" for Dr. Hook, Al Jarreau's "We're in This Love Together," "Lonely Nights" for Mickey Gilley, "Simple" for Johnny Mathis and later many of Alan Jackson's hits as well as "Between

Life, I went, 'Holy smoke! If I ever have the chance to produce talent like that again, I'll be sure to stick with it.'"

He *was* lucky enough two years later when he "found" Alan Jackson hanging out at Glen Campbell's publishing company. "I would come in there and play some demos that I was working on and Alan would always go, 'How did you get that sound?' or 'I like the way the vocal sounds on that.' One thing led to another, we started to write together, and Alan finally said, 'Hey man, would you do some demos on me?' There was no question about what to do with him in the studio. I'm a huge fan of traditional country music. I grew up being around it and I saw the same thing in Alan. I saw the chance to make the kind of country records I used to like to hear on the radio."

In fact, Stegall says he was so influenced by what he calls the Billy Sherrill era of the '60s, and Johnny Horton records, that he tried to recapture those sonics by using the upright bass—a usual Nashville no-no—on Jackson's records. To date, Roy Huskey Jr. has played upright on such Jackson songs as "Chasin' That Neon Rainbow," (from the first album, *Here in the Real World*) "Love's Got a Hold on You" and "Just Playin' Possum" from *Don't Rock the Jukebox*, "Walkin' the Floor Over Me," "I Don't Need the Booze (to Get a Buzz on)," "Up to My Ears in Tears," "She Likes It Too" from *A Lot About Livin' (and a Little 'Bout*



PHOTO: MARK TUCKER



PHOTO: ALAN MAYOR

Left to right: Steve Lindsey, Aaron Neville and Keith Stegall

an Old Memory and Me" for Travis Tritt.) Back before Randy Travis ever had his record deal, Stegall had produced a live tape that Travis had sold at his concerts, but Stegall went on to have his own Top 20 country success in 1985 with "California" and "Pretty Lady," which became the priority.

"Finally, I told Randy he needed a full-time producer because I was gone so much. When my career went sideways and I got my first royalty check [for *Storms of*

Love] and Jackson's recent smash, "Tall, Tall Trees" from the current album *The Greatest Hits Collection*. "I can't stress enough what a genius [engineer] John Kelton is, sonically," says Stegall. "He has, in a lot of ways, become my right hand. Together, he and I came up with a recording technique that we used on Alan. I don't think it's anything spectacular, but it works for us. It's a combination of digital and analog formats together. I take my time and want to use as much color as I can, so I rely on the digital format, but I really prefer what happens to an analog signal. We usually track using a 24-track and 32-track locked up together. What I leave analog is the bass, the drums, an instrument like the fiddle, which, when it's digital, can cut your ears off, and electric guitars. The things we leave digital are

BY ROBYN FLANS

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acoustic guitar and grand piano—especially on a ballad. At the end of the day, we bounce the things that are analog over to 32 tracks because all a digital signal does is give you back exactly what you give it. Even though the analog is transferred to digital, [the feel] is still analog, so when we mix, it's a hybrid of the two formats together." Stegall likes to use an Otari analog recorder and Mitsubishi digital 32-track to make his records.

"I make my records in three places," he continues. "I track at one place, then I have my own studio where I have a

Trident 80C console and Otari analog machine where I do the bulk of the overdubs, then I go to another studio to mix. My two favorite rooms in town are Sound Stage and the Castle. Both places have SSL G Series in the rooms for mixing. Two of Alan's albums [*A Lot About Livin'* and *Who I Am*]



IT DOES NOT SAY ON THE SLIDE

Left to right: Keith Stegall, Alan Jackson, Jim McBride, Dan Wilson and Danna Hinley

were actually tracked at the Castle, which is a little harder, although they have since configured the room a little more toward tracking. I like those two rooms just because things sound good to me in them and it's a good vibe; the environment to work in is good. I think feeling is as much a part of this as technology."

"Here in the Real World," cut at Omni Recording Studios, is a track Stegall describes as magic in the making. "It was the last song on the tracking date," he recalls, "and we had done it three or four different ways and it didn't come together. But Rob Hajacos had been telling Mel Tillis stories all day and he had been playing some of these fiddle intro things off of Mel Tillis songs. Finally, everybody was back in the room, putting their instruments away and Alan Jackson looked at me and said, 'What's the matter, man? You're not smiling, something's not right.' The guys were signing the time cards, and I turned around and said, 'Could you guys do one thing for me?' I looked at Hajacos and said, 'Rob, play one of those Mel Tillis kind of intros and let's try to cut this thing one more time.' They went out and that was the track. We knew it was the record, and it ended up being the breakthrough for Alan."

"Chattahoochee," which won CMA and ACM Single of the Year awards, also felt magical as it was going down, as did a ballad on the same album (*A Lot About Living*) called "(Who Says) You Can't Have It All."

"The solo that [piano player] Pig Robbins played on that song made the hair on my neck stand up," Stegall comments, although he admits that that

—CONTINUED ON PAGE 247

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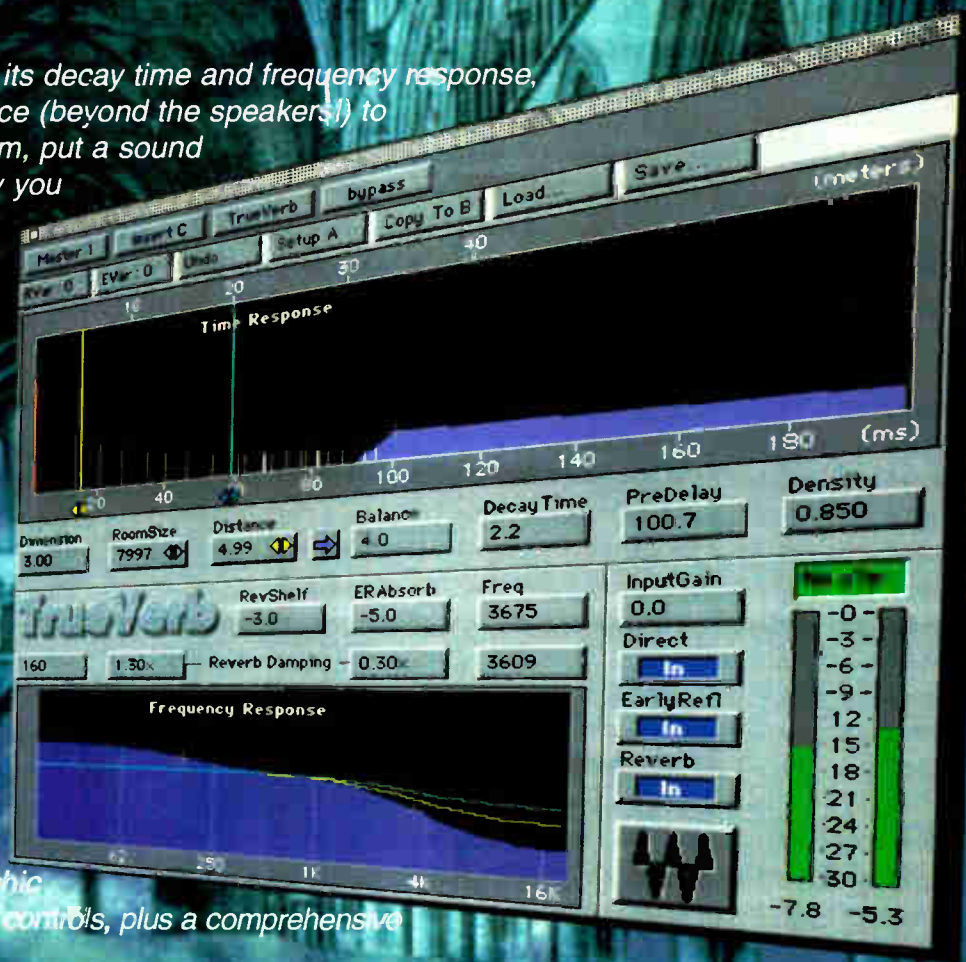
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KIRBY SHELSTAD

THE IMPORTANCE OF BEING ERNEST

Kirby Shelstad's dilemma is Nashville's dilemma. Shelstad and partner Bruce Arntson built a project studio in Shelstad's Nashville home. It's a collaboration based on their scoring work for four feature films and one TV show starring the "Hey, Vern!" guy, Jim "Ernest" Varney. The pair has put together a sophisticated MIDI-based sequencing studio, running Opcode's Studio Vision and Digidesign's Pro Tools on a Mac Quadra 950. (The board is a 40-channel CAD Maxcon console; storage is 32 tracks of Tascam DA-88.) But, despite the Varney features and CBS show, additional film and video work has not been forthcoming. Their business is now based around song demos and pre-production tracking for artists like Beth Nielsen Chapman. "We were really reluctant to do any press relating around those movies," says Shelstad. "We were afraid of getting typecast; we didn't want to become known as the 'Ernest' guys."

Nashville itself has been typecast by everyone in the entertainment industry as a place to go to get a fiddle or a banjo on a track, then get the hell out before dark. While CBS seemed to have no problem with the fact that the music for *Hey Vern, It's Ernest!* originated in Nashville (the Saturday morning program ran in 1988), Disney's Touchstone division was a bit more hesitant. "When we went out to Hollywood to do some spotting work on the first movie, *Ernest Goes to Jail*, we sat down with the guy at Disney and showed him our stuff, and he seemed fine about it," recalls Shelstad. "Then when we got back to Nashville, we got a call from a music supervisor in Hollywood who said that Disney asked him to get involved because they were all freaked out that a bunch of guys from Nashville couldn't



handle the music for a major Hollywood movie."

Nashville advertising executive John Cherry, who invented the Ernest character for a series of regional milk commercials and hired Varney, went to bat for Shelstad and Arntson (a comic who was originally hired to write sketches for the TV show). They went on to do all four *Ernest* films.

The pair composed and tracked in their personal studio, using sequencers and synthesizers. Shelstad, who trained as a percussionist at the University of Minnesota 20 years ago, would then add effects using his Malletkat MIDI xylophone. As new cuts were made during filming, the rushes were flown to Nashville, and Shelstad and Arntson would edit the music tracks. After the MIDI tracks were notated in Finale and prepped by orchestrator Conni Ellis, the SMPTE-striped tracks were taken to Nashville's Javelina Studios for a session with local string players; those tracks were then combined with the synthesized tracks.

BY DAN DALEY

"It was a very over-the-top musical effect," explains Shelstad. "It was meant to be big and cartoonish-sounding, like the old Carl Stalling soundtracks for 'Looney Toons.' When we needed to, we'd add things like a big church organ on *Scared Stupid*, but it was always based around the work we did in our project studio. We always printed our click tracks, and the live sessions were done to those and our synthesizer tracks, never to

picture. All the tempo changes would get worked out beforehand. And doing it that way always worked.

"It was pretty interesting to go from being able to do tracks and sessions and overdubs whenever you felt like it to the ultra-intense scheduling of a film date with live musicians," continues Shelstad. "At home, you get the luxury of

doing things as you feel like; in the studio, you have two days and 40 people on the session, and you have to decide right then and there if it's the take you want."

Ernest has become a double-edged sword for Shelstad. He and his partner found that they had to be cautious about using the biggest credit of their careers in promoting themselves. "That's why so many artists tend to sound the same from record to record," Shelstad mourns. "Because that's what the business wants from them. And even Nashville itself is a little guilty of that mindset. When I first moved here, I was playing some pretty strange stuff. And I found that if you're not playing something they understand, they think you're a jazz player. And if you're a jazz player in Nashville, forget it." ■



BY BOB MCCARTHY

COMB

Where They Come From

FILTERS

And How To Deal With Them

Comb filtering is the principal cause of coloration of sound system response. The addition of two similar signals that are offset by time produces a combined signal that exhibits marked nodes of cancellation and reinforcement at regular and predictable points in the audio spectrum. The resulting arrangement of peaks and dips, when displayed on a high-resolution analyzer in a linear frequency axis display, looks like a comb, hence the name. However, the image of a comb—with its regularly spaced teeth—is somewhat misleading. To our ears, the spacing between the peaks and nulls is not even. When viewed on a logarithmic scale, as in the accompanying illustrations, we see it as we hear it, a series of wide peaks getting closer together at higher frequencies.

The exact causes of comb filtering are poorly explained in most audio texts and, not surprisingly, are widely misunderstood. Most engineers are familiar with the audible effects of comb filters, which can be used to produce such delay-based effects as phasing and flang-

ing. While useful in controlled situations, unwanted comb filtering can have a devastating effect when applied to an entire sound system. The purpose of this article is to help predict and recognize when and where combing will occur in practical sound design applications. Fluency with the concept of comb filtering can improve your ability to design efficient, coherent sound systems. Successful control of the effects of comb filtering enhances the efficiency of a playback system by ensuring that speakers work together rather than cancel each other, and it can minimize the effects of unfavorable room acoustics.

HOW COMB FILTERS ARE CREATED

There are a variety of ways in which comb filtering can be introduced into a sound system. Four of the more typical causes are reflection, multiple speaker interaction, multiple microphone interaction and the addition of direct and miked signals from the same source (such as bass guitar or keyboards). The result is the same in all cases: measurable ripple in

Figure 1: A comb filter created by combining two identical signals at the same level but with a 1 ms time offset. The upper window shows the combined frequency response—a series of deep notches due to cancellation starting at 500 Hz (half the comb frequency of 1,000 Hz). The lower window shows the combined phase response, which cycles 360 degrees every 1,000 Hz.

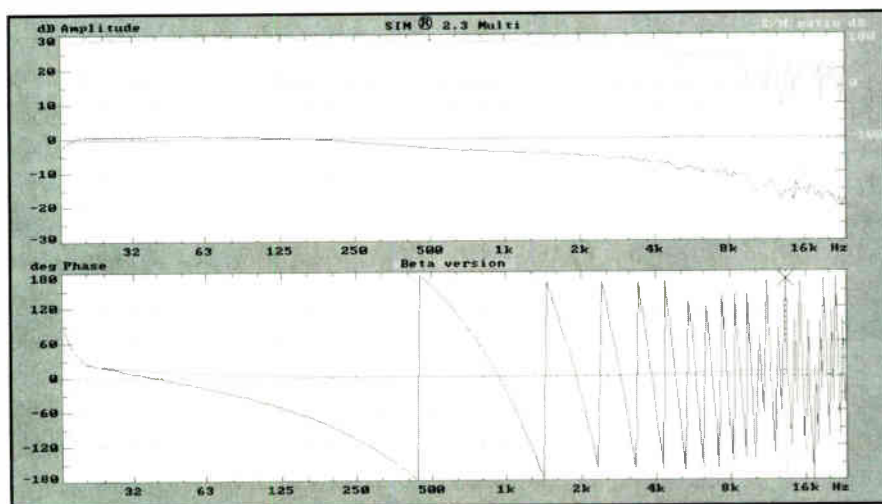
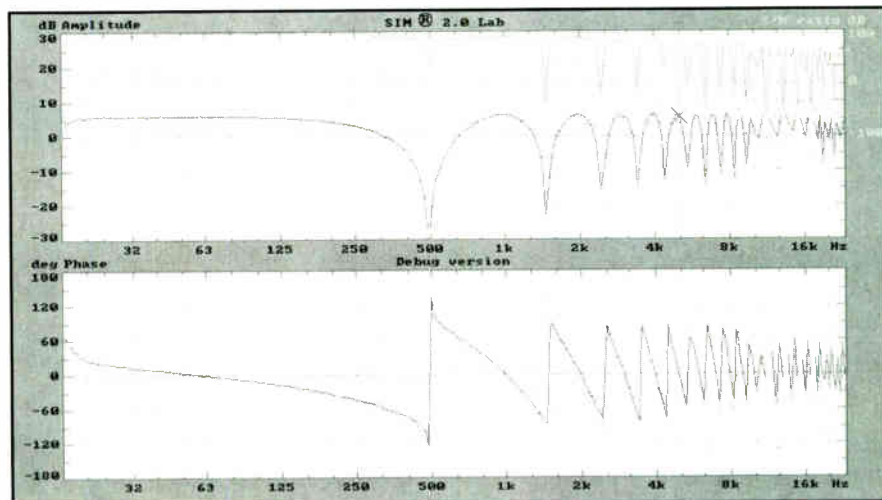


Figure 2: The upper window shows the separate frequency response of the original signal (flat) and an identical signal (delayed 1 ms) with HF roll-off. The lower window shows the phase response of the two signals. The original signal shows close to zero phase deviation. The delayed signal cycles through 360 degrees of phase deviation (relative to the original signal) every 1,000 Hz.

the phase and frequency response, and a loss of signal-to-noise ratio.

Two factors independently determine the magnitude of the effect of comb filtering and the frequency response of the comb filter curve. The first is the relative levels of two similar (if not identical) signals arriving at different times. The magnitude of the peaks and dips increases as the two signals approach equal levels. The second factor is the time offset between the two signals. Only the highest frequencies are affected at short time offsets. As the time offset increases, lower frequencies are affected.

The formula for calculating comb filters is simple. The comb frequency (CF) equals 1 divided by the time offset in seconds (TO), or $CF = 1/TO$. The first cancellation, or “null,” occurs at one-half the comb frequency. Additional nulls are found by adding the

comb frequency to the frequency of the first null any number of times. For our “easy math” example, consider two signals with a time offset of 1 millisecond. (At room temperature, 0.001 second equals just over a foot, or about a third of a meter.) See Fig. 1: The reinforced frequencies are multiples of the comb frequency, in this case 1,000 Hz. The addition occurs because the phase relationship between the two signals is a multiple of 360 degrees, bringing it “full-circle” and resulting in phase addition. The maximum cancellation occurs at the halfway point between peaks, in this case 500 Hz, 1,500 Hz, 2,500 Hz, etc. This is due to the phase cancellation that occurs when the signals are 180 degrees apart. During comb filtering, when the phase responses are 120 degrees apart there is no addition or cancellation. Notice that below the first null, in the area of 400 Hz and down,

there is only coupling, which is audible as low-frequency boost.

COMB FILTER FREQUENCY

The frequency where comb filtering starts depends on the time offset. However, above the first null, the shape of the response is the same, illustrating how the same sonic effect moves through the audio range as the time offset changes. In all cases the peak between the first and second nulls is an octave wide, and the first two nulls are an octave apart. Succeeding peaks are always $\frac{1}{2}$ -, $\frac{1}{4}$ -, $\frac{1}{8}$ -octave, etc.

At longer time offsets, the frequency at which the first null occurs slides lower, and each successive null also moves down, with the spaces between them seeming to get smaller due to the log scale. At a shorter time offset of 0.1 milliseconds, the peaks and dips are pushed higher in the frequency domain, and the 6 dB of coupling below the first null (half the comb frequency) covers a larger part of the audible frequency spectrum. Any strategy that minimizes the time offset reduces the effect of comb filtering in the audible spectrum.

COMB FILTER LEVEL

Maximum addition of 6 dB occurs when two signals of equal level and phase are combined. This is perhaps the only potentially positive aspect of comb filtering. On the other hand, the out-of-phase cancellation is extremely deep and narrow. The widths of the peaks and dips are not symmetrical, and the peaks are broader than the dips. While the size of the peaks may be reduced by equalization, the dips are too deep and narrow to be practically equalized, hence the audio adage, "You can't fill a hole."

As we move away from the case of two signals equal in level, the peaks and dips are reduced in size, and the steepness of possible corrective EQ filter shapes becomes less severe. For ex-

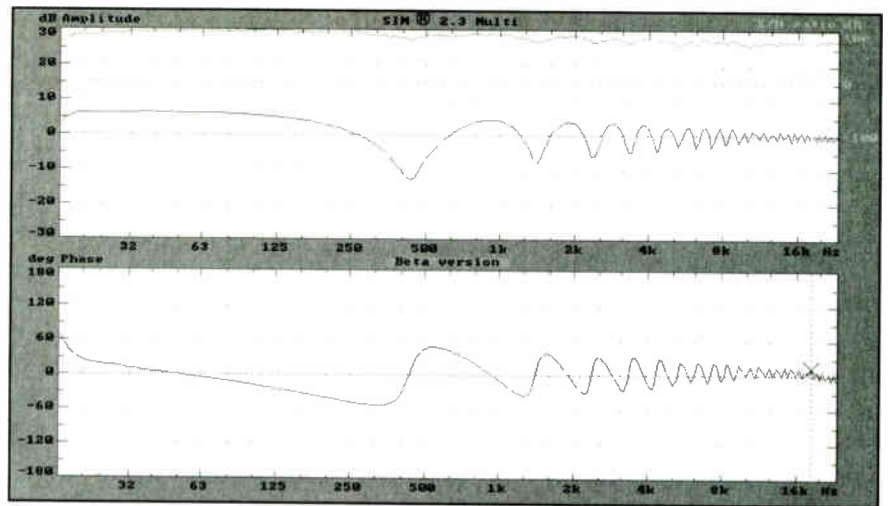


Figure 3: The frequency and phase response that results when the original signal is combined with a 1 ms-delayed signal showing HF roll-off. The depth of the frequency response notches caused by comb filtering is reduced as frequency rises (upper window). The combined phase response deviation is also reduced at higher frequencies (lower window).

ample, with one signal 6 dB louder than the other, the ripple is reduced to +3 dB and -6 dB. This allows the system to be more adaptable to equalization. Once all the other means of system alignment have been exhausted (such as repositioning loudspeakers, adding absorption, accurately setting delays and levels), you will have minimized the time offsets and maximized the level offsets. The response ripple that is left can be dealt with by equalization.

EQUALIZATION

Recall from the earlier discussion the gradual narrowing of the bandwidth of each successive peak, starting with an octave, then a $\frac{1}{2}$ -octave, a $\frac{1}{4}$ -octave, a $\frac{1}{8}$ -octave and so on. For equalization to be effective, the equalizer must have adjustable bandwidth and center frequency— $\frac{1}{8}$ -octave graphic equalizers are wholly inappropriate for correcting comb filtering. EQ devices with fixed center frequencies and bandwidth only provide, at best, one filter whose bandwidth matches the system response; all the other filters are either too wide or

too narrow. Further, that one filter will only be useful if the peak frequency requiring EQ happens to fall on one of the ISO standard center frequencies—not very likely. The phase response of graphic EQs is often blamed for poor results. While this may be true in some cases, more often it is the graphic EQ's inability to create the complementary amplitude and phase response that is to blame. For this reason, users of high-resolution FFT-based alignment systems such as SIM System II exclusively specify and use parametric equalizers.

It is much easier to assess and minimize the effects of comb filters if they can be seen on an analyzer. Unfortunately, the most common audio analyzer, the $\frac{1}{3}$ -octave RTA, is not very useful in this application. In order to display the effects of combing, the analyzer must have high resolution, such as $\frac{1}{24}$ -octave, and should also display the phase response and signal-to-noise ratio. With these parameters displayed, you can more easily assess the full extent of the combing, what the best so-

—CONTINUED ON PAGE 218

Comb Filtering Effects at Various Time Offsets

Offset (ms)	Offset (inches*)	Freq. Spacing (Hz)	1st null (Hz)	1st peak (Hz)	2nd null (Hz)	2nd peak (Hz)
0.1	1.35	10,000	5,000	10,000	15,000	20,000
0.2	2.7	5,000	2,500	5,000	7,500	10,000
0.4	5.4	2,500	1,250	2,500	3,750	5,000
0.5	6.75	2,000	1,000	2,000	3,000	4,000
0.8	10.08	1,250	625	1,250	1,875	2,500
1.0	13.5	1,000	500	1,000	1,500	2,000

* at room temperature, assuming your room is 68°F



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NSCA EXPO '96: "SHOW ME" STATE HOSTS "HEAR ME" SHOW

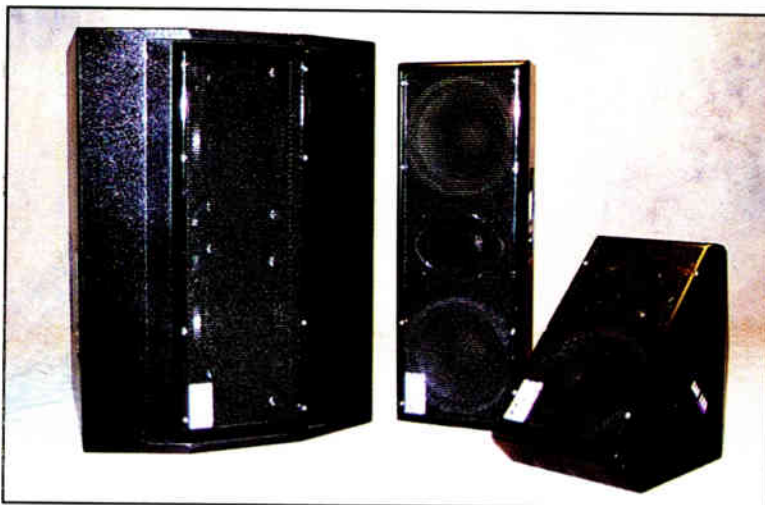


Left: Renkus Heinz TRAP Jr.
Below: Sound Image G-2 MULE



The Expo '96 conference and exhibition staged by the NSCA (National Systems Contractors Association) in St. Louis, Mo., May 10-14 was a relatively low-key affair—a pleasant contrast to the noise and hype of many other industry conventions. Unfortunate scheduling—which put the Expo in head-to-head competition with AES Europe and Mother's Day—kept some exhibitors away, but close to 500 occupied a large exhibit hall and three dozen demo rooms in the downtown America's Convention Center. NSCA also presented a four-day program of seminars, classes and certification programs. Total attendance peaked slightly above last year's total at 8,002, including exhibitors. The 1997 conference is scheduled for April 18-20 in Charlotte, N.C.

NSCA is a "table-top" show, and exhibition rules prevent extravagant promotional displays and audio playback on the show floor. Nevertheless, NSCA is a popular forum for new speaker introductions, and the abundance of demo rooms makes this casual and en-



Bag End Gem Series

joyable event a favorite for inspecting and auditioning new products. Here are some highlights from the many new SR products on display.

SPEAKER CORNER

Bag End (Barrington, Ill.) added to its Gem collection the \$2,750 Crystal full-range enclosure and the \$3,500 Quartz subwoofer. The

BY MARK FRINK AND CHRIS MICHIE

Crystal has two 12-inch drivers, the same 40°x50° oval wave guide and compression driver found in the single-12 Sapphire, and a passive Time-Align[®] crossover. The 100-lb., 43-inch tall enclosure's polygonal footprint has side angles that allow it to be used in arrays, and an additional angle for use as a floor monitor. The Quartz quad 18 is an extremely high-output subwoofer

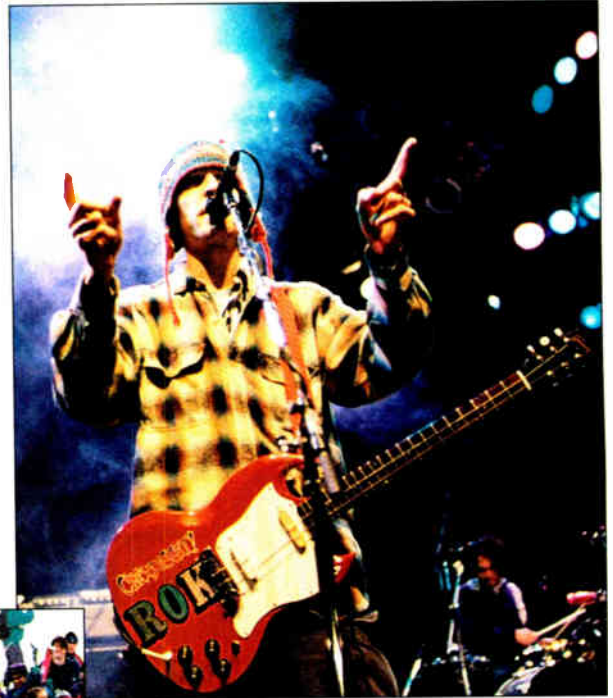
—CONTINUED ON PAGE 146

SNOWJOB 96

Rockin' in the Rockies With Melissa Etheridge, The Goo Goo Dolls and the Presidents Of the United States of America

My company, LiveWire Remote Recorders, specializes in location recording for concerts. We operate two systems: a dual 24-track analog setup in a five-ton truck and a 24-track digital airpack stored in 16 flight cases for gigs where the truck would not be practical.

We were contacted last November by MuchMusic, Canada's equivalent to MTV, about the possibility of recording a week of televised concerts at various locations in Alberta's Banff National Park as part of their "Snowjob 96" special, to be recorded in March. In the States, students go to Fort Lauderdale during Spring Break. In Canada, Spring Break is also known as Ski Week, and students flock to resorts in Banff, Lake Louise and Whistler, B.C. Some of the concerts were to take place outdoors, at the foot of ski hills, where parking a truck beside the "venue" would be out of the question. A couple of the sites were only accessible by ski lift or Snowcat. But, hey, we're Canadians! Snow is not an obstacle!



Presidents of the United States of America



Barenaked Ladies

Snowjob 96 turned out to be an ideal situation for the airpack. After receiving input lists and stage plots from each of the six bands being recorded, we assembled a system. The airpack was based around three Mackie 16-8 8-bus mixers that were modified by Thortronics (Toronto) to function as a single 48-in, 24-bus console. The solo buses were linked so that any input soloed on any of the three boards appeared at the control room output of the mas-

ter console. The aux sends were also combined using a Mackie mixer. Mix B was used as the two-mix to the video control room, and Mix B source buttons were changed into monitor mute buttons.

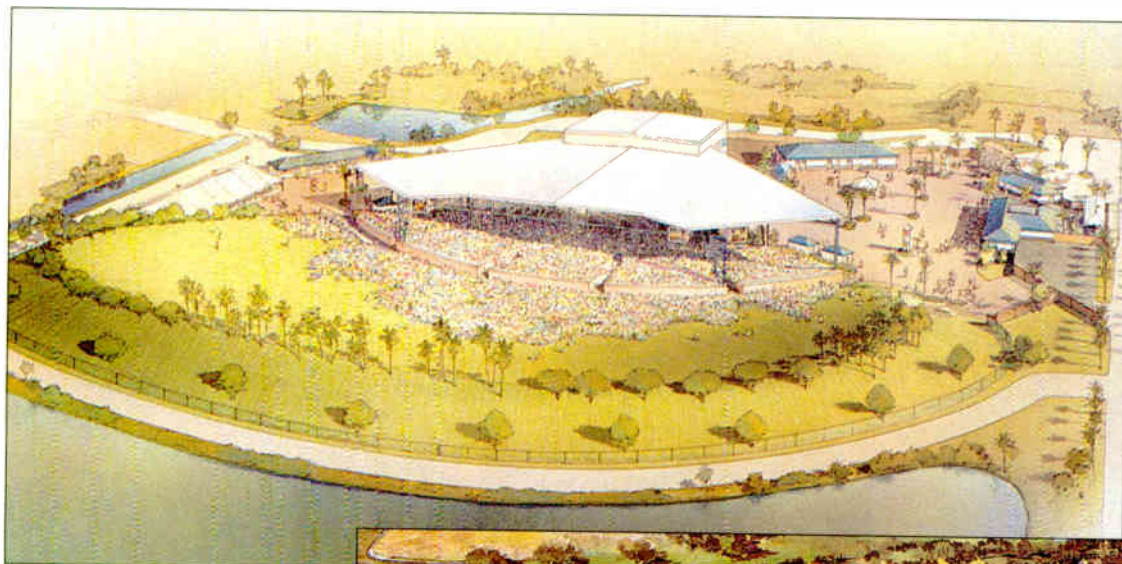
We used three 16-input boards, rather than two 24s, because of size constraints. Often, on remotes in strange locations, you don't have access to a van, and cases have to be put into trunks of cars. I've also learned to avoid having gear in a case so large or heavy that it can't be lifted by two people. You can't always count on forklifts, or even human loaders, at some venues. Having three discrete consoles is also handy in case of an accident. I can always count on at least 32 inputs and two working power supplies if one console fails.

Although the two-mix to video was of primary importance, the plans included recording the concerts on 24-track digital using three Tascam DA-88 recorders. We've had no problems with the DA-88s in the two

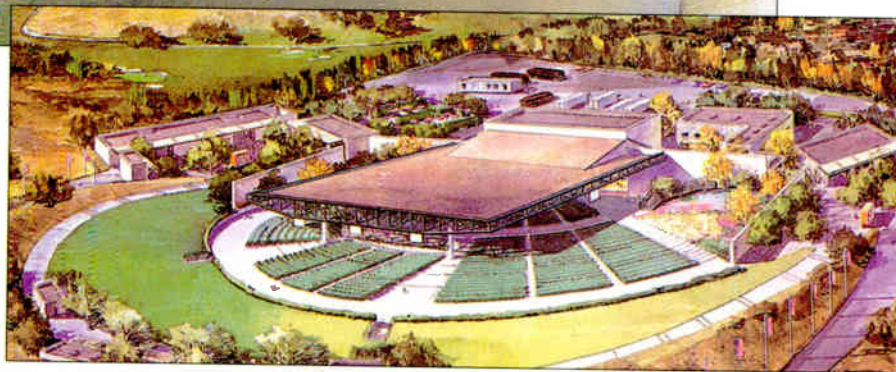
years we've had them, during which

BY DOUG McCLEMENT

—CONTINUED ON PAGE 144



Above: Coral Sky Amphitheatre,
Right: Concord Pavilion



NEW SUMMER VENUES

As concert-goers are well aware, there are few venues ideally suited to large-scale amplified music productions. Yet despite the discomfort and often appalling acoustics, rock music fans have for decades spent good money to see their favorite artists at ice rinks, armories, field halls, county fairgrounds, sports arenas and football stadiums. As the concert business continues to grow, many promoters are securing access to more suitable venues by building their own, and the outdoor summer amphitheater, or "shed," is the most popular design. Three new amphitheatres opened this season, and one older classical-music shed, the Concord Pavilion, has been remodeled. Here's what to expect when your tour bus rolls in.

SONY MUSIC/BLOCKBUSTER CORAL SKY AMPHITHEATRE

The Sony Music/Blockbuster Coral Sky Amphitheatre in West Palm Beach, Fla., is a 19,800-capacity amphitheater designed to accommodate the largest touring shows. The concrete stage is 108 feet wide and 64 feet deep, with a central 64x30-foot sprung wood deck section. Trim height is 54.5 feet from stage. A covered loading dock can handle

seven trucks simultaneously, and there is additional parking for five buses. The FOH mix position is 100 feet from stage center, behind the 6,800 reserved seats, which are under a metal canopy. Sound for the 13,000-capacity lawn area is supplemented by a delayed system of Clair Bros. R-4 cabinets. At press time, no upper SPL limit had been fixed. Production manager is Ray Steinman. Tel. 407/795-8883, fax 407/795-6608.



Virginia Beach Amphitheater

VIRGINIA BEACH AMPHITHEATER

The Virginia Beach Amphitheater in Virginia Beach, Va., is a 20,000-capacity open-air amphitheater (7,500 reserved, 12,500 lawn). The stage is 120 feet wide and 66 feet deep, with a trim height of 66 feet and total rigging capacity of

BY CHRIS MICHIE

120,000 pounds. The 100x30-foot loading dock can handle ten trucks; three 16-foot-wide roll-up loading doors lead directly to the stage. The FOH mix position is 96 feet from the down-stage center edge and is 18 feet wide and 15 feet deep (the lighting director's area is directly behind). Both mix areas are in front of the main transverse aisle that divides the reserved seating area—VIP boxes are directly behind the aisle. The lawn delay system is supplied by Maryland Sound and consists of 12 NW2 cabinets. SPL limitations are 102 dB SPL (A-weighted) at the board, 95 dB at the top of the hill and 60 dB at the property line. A curfew goes into effect at 11 p.m. There is parking for five buses (with power), and the seven dressing rooms may be reconfigured as suites. There are also separate guest production offices and laundry facilities. Production manager is Rob Manley. Tel. 804/368-3000, fax 804/368-3025.



Star Pavilion

HERSHEYPARK STADIUM STAR PAVILION

The 7,000-capacity Star Pavilion is a new addition to the Hersheypark Stadium complex in Hershey, near Harrisburg, Pa. The open air amphitheater is designed to complement and share facilities with the 25,000-capacity Hersheypark Stadium, where Electric Factory Concerts have been promoting outdoor shows for more than two decades. The Star Pavilion is a contoured bowl situated behind the Stadium's 70-foot wide by 49-foot deep stage; Star Pavilion acts play on the same stage but with their backs to the Stadium. Additional 27x49-foot sound wings have been added for Star Pavilion productions, and the loading dock will accommodate six trucks. FOH mix position for the 4,000 reserved seats and 3,000-capacity lawn is a long 120 feet from center



Concord Pavilion FOH position during construction

stage. There is no delay system installed, but there is no SPL limit either. Additional facilities include four dressing rooms and generous backstage parking. Rich Weimar is the Star Pavilion booking/events manager, and John Stephenson of Electric Factory Concerts of Philadelphia is the technical contact at 215/569-9400.

CONCORD PAVILION

The Concord Pavilion, Concord, Calif., has finally undergone its long-anticipated and extensive (\$21-million) renovation, resulting in a new seating capacity of 12,730 (230 premium box seats, 7,500 reserved, 5,000 lawn), an increase of 4,000 over former capacity. The striking Frank Gehry-designed square roof structure remains, but the seating and lawn areas have been completely recontoured and new concession areas and bathrooms added. The new stage house features a 120-foot wide by 50-foot deep stage with 48 feet of vertical clearance. A five-truck loading dock, plus parking for eight buses, eases access for large productions. The new 28-foot wide by 30-foot deep FOH mix position is 90 feet from center stage and can be reached via the underground dressing room and lounge area, all that remains of the original circular thrust stage design. (Because of its previous history as an orchestral concert hall, the Pavilion boasts unusually large dressing room facilities, including a chorus room and lounge area.) AC power specs include a 400-amp isolated service for sound.

Though the addition of 4,000 seats is significant, the stage redesign is the key to the Pavilion's future viability as a reinforced music venue. Until now, the Pavilion has been compromised by an unfortunate combination of limited capacity and a 360-degree thrust stage unsuited to modern show production. Designed as an outdoor con-

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LIVE SOUND

cert hall for classical music, the Pavilion originally incorporated several innovative techniques designed to reproduce the acoustical signature of an enclosed concert hall, including an assisted resonance (AR) system, reflective panels and an architect-specified sound system. The "theater in the round" concept was a popular concert hall design feature in the '70s and was a particular hallmark of the Pavilion's acoustic designer, Dr. Christopher Jaffe. However, commercial realities soon forced management to pursue a wider audience, and the demands of amplified rock shows exacerbated the practical and acoustic limitations of the original design. There was nowhere to put the P.A., onstage equipment obscured sight lines for many prime seating areas, and the circular catwalks designed to support AR systems and reflectors imposed a frustratingly low trim height. Plus, the acoustic treatment originally specified for the underside of the metal roof was only partially installed, due to construction cost overruns. This year's near-total redesign undoubtedly brings the Pavilion up to current professional show production standards; the first show on August 3 will give some indication as to whether the acoustic characteristics have been similarly upgraded. Production manager is Bill Keithland. Tel. 510/798-3319, fax 510/676-7262. ■

—FROM PAGE 141, SNOWJOB '96

time we've done remotes for Annie Lennox, Van Halen, the Rolling Stones and Lenny Kravitz. We've often been in situations where the tapes have to be mixed and laid back to video immediately after the show, and the fact that the decks have internal SMPTE generators and synchronizers is a very handy feature, not to mention the almost two hours of continuous recording time.

The LiveWire airpack also features a rack of outboard effects consisting of two Lexicon reverbs, a Yamaha ddI, four Drawmer noise gates, two dbx 160vu compressors, eight CDT compressors, a Drawmer stereo compressor, two JVC video monitors, a Clearcom intercom system, Furman AR-PRO AC power regulator, Sony DAT and Tascam cassette recorders, and an Amcron power amp, with a pair of Yamaha NS-10M monitors. It takes about two hours to set up the system, including running

a 250 54-pair transformer-isolated split mic snake, intercom and a talkback speaker to the stage.

We shipped the gear by air from Toronto to Calgary and had it trucked the final 90 miles to Banff. It was then taken to the foot of Mount Whitehorn near Lake Louise, for an outdoor show by Canadian Celtic rocker Ashley MacIsaac. The stage was an 8x24-foot platform in the snow, and the nearest practical area to set up the audio control room was in a gazebo housing a "Beaver Tails" fast-food snack bar. There was no way to drive a truck directly to the gazebo, so the P.A. and recording equipment had to be off-loaded into large containers and carried by Snowcat to the stage and the makeshift control room.

My assistant, Anthony Montano, handled the outdoor setup, including snakes, audience mics and communication to the stage, while I set up the control room after clearing a 12x12-foot area in the unheated snack bar.

By 1 p.m., the base of the mountain was crawling with skiers in anticipation of the show. MacIsaac was brought to the stage in a Ski-Doo and proceeded to play a blistering set of tunes on electric fiddle, accompanied by bagpipes, bodhran and a rock rhythm section. Some of the songs featured vocals in Gaelic. The band's instruments and vocals used up 22 inputs, and I added four audience mics, as well as a handheld RF mic for the host veejay. Over the years, I've found that condenser mics don't always work in sub-zero temperatures, so SM58s were used for the audience, with additional windscreens—it sometimes gets windy a mile above sea level. I always use four audience mics, so if one goes down, I still have a pair available somewhere.

The two-mix output of the console was fed to a Sony BVW-30 Betacam video recorder, which was receiving picture from a camera mounted on a 20-foot jib. A video sync generator fed sync to the video recorder, a SMPTE generator and the master DA-88. This ensured that the SMPTE and the speed of both machines was referenced to house sync. The other four cameras were jam-synched to the SMPTE generator just before the show, because they were running in ENG format. There was no video mobile or switched video feed on this shoot. The two-mix was also fed to tracks 1-2 on the DA-88 as a backup.

After the show, the gear was torn down and taken to Chateau Lake

Louise, a stately old ski resort that reminded everyone on the crew of the hotel in *The Shining*. We expected Jack Nicholson to break through the doors with an axe at any moment! The lobby featured a huge picture window with a gorgeous view of the frozen lake and the mountains in the background. This was to be the setting for an intimate performance by Melissa Etheridge.

We built the audio control room in a corner of the Edelweiss restaurant, about 200 feet from the performance area.



Goo Goo Dolls

Etheridge's setup was fairly straightforward, with only 15 inputs. The trickiest part of this shoot was fitting the monitor console, the FOH console, the band gear, a guitar tech area, five cameras (including a 20-foot jib), a 20-man crew and an audience of 250 into such a small space. The band's crew was very cooperative, and after sorting out some minor grounding problems between the video mobile and the audio setup, the show went off without a hitch. It's hard to go wrong when you have excellent musicians playing great songs with well-maintained, good-sounding equipment!

We then took the gear 30 miles to Mount Norquay, where we set up in the ski patrol hut to record Rusty, a Canadian alternative band. Nothing like doing a live mix while skiers with twisted ankles are being carried through your control room on stretchers! The band played outdoors, and again the P.A. gear had to be brought to the stage in small trailers, towed by Ski-Doos. Live sound was provided by FM Systems of Edmonton, Alberta, and was

operated by Blair Mac Ewan and Pete Villeneuve, who did an amazing job given the logistical problems posed by the mountain venues. The bands understood the limitations and had to put up with substantially less gear than they were used to, both in terms of P.A. and monitors. On a gig like this, your technical knowledge gets you through a third of your day. The rest of the



The author in the control room in Banff Community High School science lab

time, you're just cooling people out.

The following day, we drove to the base station at Lookout Mountain. The gear was loaded onto freight gondolas for a 20-minute trip up to Sunshine Village. It took about two hours to get all the equipment to the top, four cases per trip. From there, it was loaded onto a Snowcat and taken to the day lodge, 7,100 feet above sea level. We set up the control room in the basement carpentry shop, about 300 feet from the outdoor stage. It was snowing as one of Canada's most popular bands, Bare-naked Ladies, started their set. More than a thousand people jammed the performance area, as the Ladies performed some of their old hits, as well as songs from their new album, referring to themselves as the Sunshine Village People. The cold temperatures caused major tuning problems with the acoustic instruments (including a stand-up bass), but the crowd was thoroughly entertained. The recording, in our makeshift control room among the table saws and drill presses, also went well.



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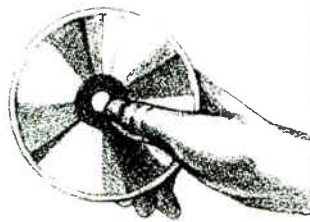
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LIVE SOUND

The final concert took place in a field on a festival stage beside Banff Community High School. We ran snakes into the science lab in the school, where we constructed the audio control room amid Bunsen burners, test tubes and pictures of Albert Einstein. During the morning setup, I took the opportunity to remix three songs from the previous concerts and lay them back to picture. The time window between the shows and the actual nationwide broadcasts was only a couple of days, so a remix of the entire set of each band would only take place in the event of a catastrophe. We had the three remixes completed by 1 p.m. and then began soundchecks for the Presidents of the United States of America and the Goo Goo Dolls. We recorded the sound checks and had the bands come in afterward to listen and approve the mixes. They offered a few suggestions and we made the desired adjustments, one of which involved adding a Sennheiser 421 to the bass drum to thicken the sound provided by the band's Shure SM91. Sometimes, a mic chosen for its ability to cut through a P.A. speaker has too much midrange for a recording mix. The Goo Goo Dolls' mixer, Hutch, stayed in the control room to act as producer during the show. This often happens on remote recordings and is really helpful on a show like this, where you're trying to avoid remixes. After dozens of shows on the road, the band's audio liaison will have a much better idea than the recordist of where the solos happen, and which effects to use where. We're all there for one purpose: to make the band sound amazing, so any input from the band's audio crew is valuable. It also makes the band feel more at ease to know that they have a set of ears in the control room that they can trust.

Due to a noise curfew imposed by the town, the concert ran earlier than usual (6 p.m. to 8:30 p.m.). More than 5,000 kids cheered, danced, stage-dived, body-surfed and generally had a great time as both bands put on solid performances despite the below-freezing temperatures. After the show, the gear was packed up for the last time to be shipped back to Toronto.

Recording six shows in five days in five different locations was a lot of work, but due to good planning on the part of the MuchMusic/Platinum Moonlight production staff, and cooperation

from the bands, their road crews and the Banff-Lake Louise Tourism Bureau, we ended up with some memorable footage and some great road stories. Next year, we'll take the casters off the cases and have skis mounted on them instead. ■

Doug McClement founded LiveWire Remote Recorders in Toronto in 1975. LiveWire has done 1,400 remotes in Canada and the U.S. LiveWire's digital airpack system has been used to record concerts in Spain, Germany, Nigeria, Jamaica, Israel and Kuwait.

—FROM PAGE 140, NSCA EXPO '96

using Bag End's unique ELF processor technology to produce flat response down to 20 Hz. Two pairs of 18s in separate, sealed enclosures face each other, presenting two 4-ohm loads. The 225-pound enclosure is 40 inches high and fitted with casters and handles. Mast hardware allows mounting full-range Crystal or Sapphire enclosures on the Quartz subs.

BGW Systems (Hawthorne, Calif.) introduced the M1100, a self-powered dual-15 sub priced at \$2,895. The 190-pound Baltic birch plywood enclosure is about 28 inches high and deep by 32 inches wide and is road-ready, supplied covered in carpet with a front-mounting caster plate. Based on BGW's previous powered quad-15 sub, the M1100 incorporates an amplifier module based on the successful GTA amplifier that includes a stereo summing amp and a lowpass crossover (adjustable over ten frequencies from 63 to 180 Hz). BGW claims that eliminating long speaker cables preserves high damping factors and eliminates cable power loss. BGW's Internet server can be reached at <http://www.bgw.com>.

Electro-Voice (Buchanan, Mich.) has revised and expanded its DeltaMax line of loudspeaker systems and has added new controller cards which slot into Crown and E-V amplifiers. The DeltaMax Series II line includes many new features (many of them in response to feedback from contractors), including newly designed LF and compression drivers, added handles, grille and aircraft track mounting hardware. The two-way DMS-1152/64 features two new components, the EVX-155 15-inch woofer and the DH2T compression driver, mounted on a 60°x40° horn and rotatable 90° for wedge monitor applications. The two-way DMS-1122/85 in-

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LIVE SOUND

cludes a new 12-inch woofer and the DH2T compression driver mounted on a 80°x55° horn. Both of these speaker systems are 30° trapezoidal boxes suitable for arraying and are designed to be bi-amped. The DMS-1183/64 is a three-way system with an EVX-180A LF woofer and a 12-inch mid-bass driver horn-loaded on a 60°x40° mid-bass horn. Coaxially mounted inside the mid-bass driver is a N/D4 compression driver mounted on a modified HP64M horn; the entire mid-bass section may be rotated 90 degrees. The DMS-2181 and DMS-1181 subwoofer systems use dual and single EVX-180A 18-inch drivers respectively.

JBL (Northridge, Calif.) introduced a new three-way, large-format enclosure, the AS 3218, as part of its Architectural Series of modular speaker systems designed for fixed installation. Weighing 185 pounds, this trapezoidal enclosure measures just under four feet tall, two feet wide and 22.5 inches deep. The system's horn-loaded midrange provides pattern control down to 300 Hz, with a coverage pattern of about 60°. The AS 3218 makes use of JBL's latest

transducer technology, including the new 2242H Super Vented Gap™ 18-inch woofer, and a new 2012H 10-inch cone driver specifically designed for the speaker's wooden midrange horn. A 2447J compression driver is coupled to an Optimized Aperture Bi-Radial* horn, which lowers throat distortion and extends frequency response to nearly 20 kHz. An outdoor installation option is available. The AS 3218 lists for \$3,995 and is designed to be tri-amped using the DSC280 digital controller, which is an OEM version of BSS's OmniDrive built for JBL. JBL's BBS number is 209/787-2955 (8N1, 2400 and up) and uses First Class™ client software or command line instructions.

Meyer Sound Labs (Berkeley, Calif.) introduced three new speaker systems, the self-powered CQ-1 and CQ-2 and the phantom-powered HM-1. The CQ-1 and CQ-2 are two-way trapezoidal enclosures measuring 30 inches high, and loaded with a new 15-inch woofer and a 4-inch diameter compression driver. Estimated price is about \$6,000. The CQ-1 has an 80°x50° (HxV) coverage pattern, while the CQ-2's coverage is 50°x40°. CQ stands for "constant Q," meaning that the distribution of

acoustic energy is evenly distributed through the coverage angles, with minimal outside spill. The horn design was developed over the past year in Meyer's anechoic chamber. The CQ systems both use the MP-2 amplifier module, first introduced in the Meyer MSL-4 speaker (see the "Field Test," page 124), and Intelligent AC™ provides automatic voltage selection and surge suppression.

Meyer's compact phantom-powered HM-1 speaker weighs only 15 pounds and is 8.5x11x9.5 inches. The bi-amplified HM-1 is loaded with a 7-inch graphite cone and a neodymium center horn for 40 to 20k Hz response and 100° dispersion. As the HM-1 system operates on 48VDC phantom power instead of 120VAC, lines carrying power to the units may not need to be run in conduit, allowing easy upgrades to older installations with under-balcony and other fill zones. Meyer's Web site is at <http://www.meyersound.com>.

Following on the success of its PS15 and PS10 speakers, French manufacturer **Nexo** (distributed by QMI, Hopkinton, Mass.) introduced the Alpha Series of large-format concert sound reinforcement speakers. The 40°x30° high-

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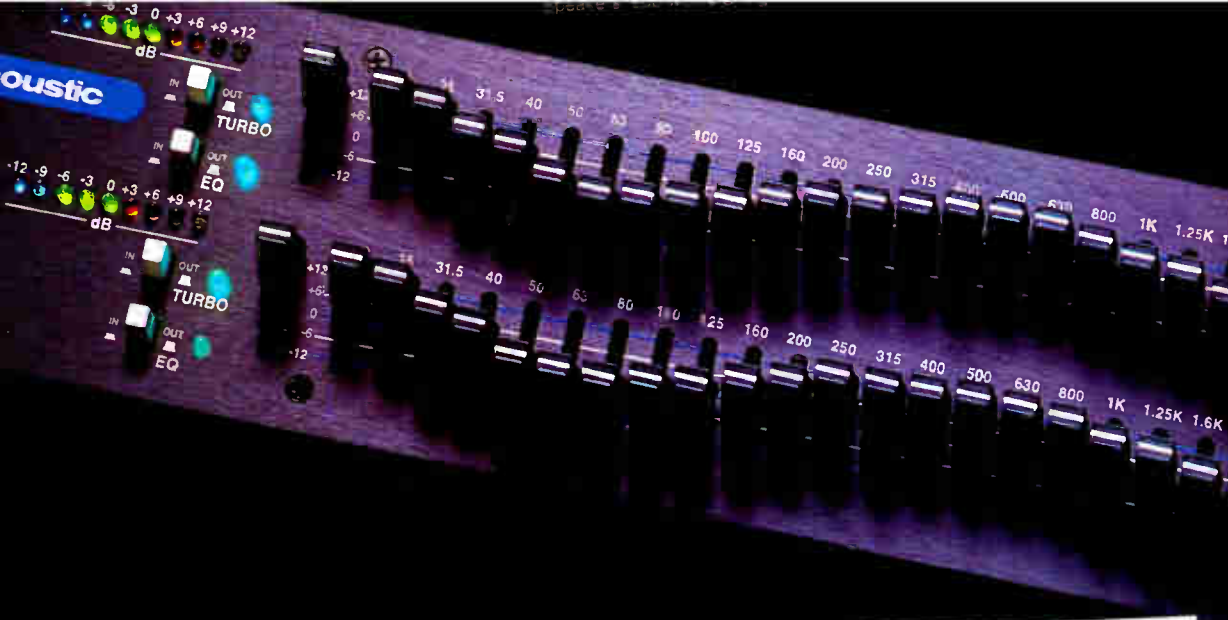
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I'm back' Jack!



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Sound Reinforcement You Can't Refuse™

World Radio History

MEMO
 FROM: Wayne
 TO: John
 RE: Problem
 Even with all this great new gear we've purchased, I'm still not happy with the vocal sound we're getting. Suggestions?

SOLUTION
 the DigiTech VTP-1
 2 channel vacuum tube mic pre-amp with digital outputs!



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The VTP-1 Story

We had been upgrading our studio but there was still something missing. You told us that some tracks just sounded too clinical, too brittle, especially the vocals. With all the new technologies available, none of us seem to capture the warmth that can still be heard in 25 year-old classic recordings.

So, we took a fresh look at equipment designs behind those classic recordings, added what we've learned since then and came up with the VTP-1.

Designed for tracking, mixing and mastering, the VTP-1 meets the challenge of today's studios. Two discrete, metered channels

of vacuum tube preamplification and 4-band semi-parametric EQ allow for dual mic recording, as well as individual instrument processing and tone shaping. 18-bit digital converters and AES/EBU and S/PDIF output formats mean that you can use the VTP-1 to interface directly to your multitrack digital recorder,

or for mastering from analog to DAT.

The VTP-1, another vocal solution from DigiTech.

Available at your dealer now.

DigiTech

A Harman International Company

VTP-1

2 CHANNEL VACUUM TUBE MIC PRE-AMPLIFIER WITH DIGITAL OUTPUTS

mid enclosure is the M4; the M8, a lower-Q version, provides 80°x50° dispersion. Both use a pair of 10-inch mid drivers sharing a common horn; a 1.4-inch-exit HF driver is mounted on its own horn in the center. Nexo's single-18 B-1 subwoofer system is a resonator design and has been re-engineered for improved performance. The B-2 double-18 sub will be offered in an enclosure twice the height, as will full-range enclosures combining mid-high and sub modules, called the S-4 and S-8. Like Nexo's PS systems, the Alpha Series relies on a servo-controlled processor to reduce distortion, increase headroom and protect the components. QMI also reports that they are now handling British manufacturer Chevin's line of high-quality switching-supply MOSFET amplifiers.

Renkus Heinz (Irvine, Calif.) demonstrated the TRAP Junior full-range speakers. Featuring a passive crossover (no need for a processor), the system has a natural, smooth sound quality. Weighing 63 pounds and loaded with a heavy-duty, Kevlar-reinforced 12-inch woofer and a 1-inch compression driver, these speakers are 26 inches high and 15 inches wide with 20° side-angles. The TRAP Junior combines RH's TRue Array Principle™ with developments in Complex Conic™ designs—constant-directivity wave guides that eliminate dispersion distortions found in conventional horns to optimize the performance through all angles of coverage. Both versions have 40° horizontal dispersion; the TRAP Junior/6 has 60° vertical dispersion, the TRAP Junior/9 has 90°. They can be used as array modules, or the horns can be rotated when used as individual defined coverage systems or as low-profile horizontally mounted enclosures. Priced at \$1,275, the TRAP Junior system sets a new price-performance standard for Renkus Heinz.

In other RH news, the TRAP40 series has added Tri-pole™ low-frequency directivity control, which allows creating consistent dispersion clusters in the vertical and horizontal planes down to frequencies as low as 80 Hz. This provides better gain before feedback in off-axis areas, for a more natural sound with less EQ requirements.

Also showing a large-format two-box concert sound trap system was a new manufacturer, **Sound and Lighting Specialists** (Springfield, MO). In a room shared with Stage Accompany, they

demonstrated speakers featuring SA's unique Compact Driver for extremely clean reproduction of frequencies above 1 kHz at full output of 130 dB. The T3-R three-way full-range enclosure has a front-loaded 15, a horn-loaded 10-inch mid and Stage Accompany's 8535 neodymium high-frequency ribbon transducer. The 4x2x2-foot, 210-pound cabinets list for \$4,400. An identically sized trapezoidal dual-18 sub weighs 175 pounds and lists for \$2,700. The recommended crossover is the BSS Omni-Drive, but because of the extremely flat response of the system, any high-quality four-way crossover would work well. Also shown was the 112RM floor moni-

tor loaded with a 12 and an SA Compact Driver and listing for \$2,250. SLS can be reached at <http://www.PCIS.net/SLS>.

Sound Image (Escondido, Calif.) showed a patented carbon-fiber composite two-way G-2 enclosure. This Multiple Use Loudspeaker Enclosure, or MULE for short, employs similar materials to those used in the stealth bomber, for light weight, high stiffness and low resonance. Listing for \$2,499, the G-2 MULE is loaded with a custom version of the 2206 and a custom 2450 loaded onto a specially designed 75° conical wave guide for extremely even coverage above 2 kHz. The enclosure weighs only 47 pounds and measures only

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NUCLEAR ACCIDENT SHRINKS PROJECT STUDIO TO SIZE OF TOASTER

In a dramatic accident that has profound implications for the music industry, a nuclear "incident" decimated a project studio and shrunk its entire collection of recorders, sequencers and tone generators—worth millions of dollars—into a size slightly larger than a pair of Pop-Tarts. Fortunately, no one was hurt since the incident occurred at 10:00 am.

"It's a miracle, really," said Shizzy Rock, the studio owner. "All the equipment still works fine, it's just all really small. Now that's helpful, 'cause I'm going to have to move around until I find a new place to live."

In his insurance report, Shizzy listed the following equipment involved in the carnage: an XG tone generator with 480 voices and three effects blocks; an 110,000 note sequencer with battery backup and 1/480 quarter note resolution; 3,800 ready-made musical phrases (and thousands of his own) used for professional composition and a large screen TV.

"I thought I was really screwed. I mean, I create everything in my project studio; from composition to production. But now I can take it all with me."

After the detonation, Yamaha engineers rushed to ground zero to record the affects of the blast. They were then able to duplicate the effects of the nuclear nightmare and package the newly configured studio as the QY700 music production studio in a box. "Funny how a disaster of biblical proportions can actually turn out for the best," Shizzy declared.

QY700



Man Survives 60 Days Adrift At Sea, Records Definitive Rock Album on Raft

Cast adrift when his 3 hour tour got rocked by a freak squall, a Hawaiian man not only survived the elements but managed to write and record a 3-CD rock opus on the high seas.

"My wife made me go on the trip. I didn't want to be there, so I brought along some gear. Just a few things: my portable computer, my Yamaha CBX-D5 HD recorder, a few Jazz cartridges, a mic and my ukulele," explained a very tan Dano Kulani.

"SHARK SHARK, oh no it's a SHARK" is the first hit single off the album. Kulani explains how it came about. "After the squall there were still a few of us left of the raft. On day 13, someone saw a shark and started screaming. I got it all with the mic, then recorded some background vocals and a riff with my ukulele. Then I started mixing and finessing on the computer using the CBX-D5. I added some of the CBX-D5's on board effects and worked out a few additional lyrics—I've had some time to think about it."

Asked if this experience has changed his life, Dano responded. "Oh definitely. Now I'm going to take my recording studio everywhere I go. You never know when you'll have a little extra time on your hands."

CBX-D5 HD Recorder



"Sound... is exceptional (particularly the low noise and sensitive EQ) for a board in this class..." "Inexpensive, great-sound, very versatile" EQ Magazine.

"As the first eight bus recording mixer to come in under \$2,000... it offers the home studio market more features per dollar than any other mixer in its class." Electronic Musician

When asked what price she had paid for her RM800-16 she said, "\$1699.00. First thing in my life I paid full price for. It was such a bargain!"

RM800-16



Haunted Mansion Scam Exposed!

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

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

Mrs. Eunice P. Wiley, convicted felon and frustrated musician, had been performing the piano parts using a Yamaha P50m piano tone generator. With the P50m's 12MB of waveROM condensed into 6MB, 40 types of effects and 3-band EQ controlled by front panel sliders, it was easy for her to accomplish any piano or electric piano sound. After studying the jazz greats in prison, she was accomplished at their techniques.

For the sax and horn parts, Wiley ingeniously chose the Yamaha VL70m. She blew into a Yamaha breath controller as she played a keyboard, triggering computer models of the wind instruments—not samples. "That was what had all the patrons fooled. She was playing an expressive melodic lead instrument with uncanny acoustic properties," explained Muir.

The otherworldly sounds patrons heard as the spirits supposedly arrived from the netherworld was also one of the VL70m's 256 voices, not a gaping hole torn in the spiritual continuum. "Wiley picked up the P50m for only \$499.95 and VL70m for just \$799.95, yet she raked in some mondo bucks. She's a devious criminal mind and a pretty fair musician," commented Muir.



VL70m



P50m

FLESH EATING PETUNIA LIKES NEW RBX

While devastating a small urban community in Des Moines, the large carnivorous flower stopped for a brief moment outside a local music store. "I just had to check out one of the new RBX basses." "After reading the reviews I couldn't believe that those boy's over at Yamaha could deliver so much bass for so little cash!" The flower was last seen...



FOR MORE INFORMATION ABOUT ANY OF THE PRODUCTS SHOWN IN THIS ISSUE PLEASE Call (800) 291-4214 ext. 820 or visit us at www.yamaha.com.

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REGULAR GUY BUYS DIGITAL MULTITRACK RECORDER!



"It cost the same as some 4-track cassette recorders!!" Guy exclaims.

It's unbelievable, but true. This reporter has uncovered evidence that regular musicians — not just cash-encrusted music moguls — can now afford digital recording. Yamaha, those same crafty devils famous for their technological know-how, now brings digital to the masses. Yamaha's MD4 is the lowest cost digital multitrack recorder available anywhere. According to Joe Jones, musician, "I got my MD4 for around a thousand bucks while most digital multitrackers are going for \$2400 and up!"

Eager to blow the lid off this story, we visited Guy as he recorded a demo with his band, Psychic Poodle. We verified the facts... using the MD4 4-track multitracker, Guy's audio quality was incredible (even if the Poodles don't have the best licks.) With digital audio storage, there's no audible noise, 0% wow and flutter and full range frequency response. The MD4 recording was so good, it could be used as final product — not just a scratch pad — even for professional composers.

It gets even juicier. Because the MD4 is digital, the sonic performance doesn't degrade with track bouncing. And you can even bounce to the same track — you don't have to keep an open track like you do with cassette recording. And get this. You can locate an exact (and we mean exact) place in your tune easily. According to Guy, "That means you can find, hear, and re-record even a short passage without erasing any of the good stuff. If only Nixon had had this instead of tapes."

Still, we were skeptical. What was the secret of the MD4? Our inquiring minds found out when Guy popped a MiniDisc out of the MD4. That explains why he could record for 37 minutes per track instead of the 22 maximum that's normal with cassettes. Those MiniDiscs are small and portable, but then again, so is the entire MD4 system. After revealing his story, Joe packed up his Poodles, his MD4 and left (Cont. on Page 24)



MD4 4-Track Multitracker

BARGAIN HUNTER BUYS COMPLETELY USELESS YAMAHA RM800 MIXING CONSOLE!

Lucretia Rubinesky prides herself on her ability to seek out unbelievable bargains. Her house is full of objects that represent incredible values. Her friends refer to her as a "Black Belt shopper". Rubinesky's husband has accepted his wife's tendency toward recreational shopping until recently, when she came home with a Yamaha RM800 mixing console.



Rubinesky ponders wife's purchase

When confronted with the fact that no one in the family has any interest in recording, she confessed that she just couldn't help herself!

"The RM800 was such a bargain!" stated the somewhat distraught Rubinesky. With 16 channels and 40 feature packed inputs, six aux sends, eight buses and direct outputs, the RM800 has the most plumbing per buck of any comparable recording console. In fact, the RM800-16 has over 93 connectors to get signal in and out of the console. We know, Lucretia counted them.

But Ms. Rubinesky doesn't know from plumbing - that's Edward Rubinesky's domain.

The only consolation for Lucretia's distress is she didn't spring for the larger RM800-24 - with 56 inputs. (\$2,399)

Not to be undone, Mrs. Rubinesky found a solution to the useless nature of her newly found bargain. She went shopping. Before leaving, however, she called the dealer from whom she bought the console for advice. Fern Yoblinsky, of Yoblinsky Music told her... "the Yamaha RM800 is the perfect recording console to be used with the new breed of digital multi-track recorders, samplers and MIDI equipment." He went on to point out that the RM800 has high performance mic pre's that interlace with professional microphones and smooth 3 band EQ with mid sweep to bring acoustic and electric sounds to life.

On the way to the store she came upon a yard sale and solved her problem with the purchase of an "almost new" 8-Track Cartridge player and a complete library of Italian Rock Operas. When she complained to the dealer that her system didn't sound so good, he was quite surprised. What with major magazines declaring

NATIONAL

The Inquisitioner

Nobody Expects The Inquisitioner. Vol.2 Issue 1114

WOMAN CHANNELS 39 SPIRITS: STILL BEAT BY YAMAHA'S O2R!



Dozens of lonesome or distraught spirits use psychic Junebug Jones to channel to the living world. That's quite a feat ... but that's still not as many channels as Yamaha's O2R offers! The O2R Digital Recording Console offers an incredible 40 channels for input/output capacity that's out of this world! Miss Junebug's powers are nothing compared to the extraordinary signal processing power of 40 input channels, 8 output busses, 16 direct outputs, and 8 auxiliary sends. That means it can handle digital mixdown of up to 32 tracks while the psychic can only track down one spirit at a time. • Junebug also helps clients recall exciting past lives. If only she had the O2R, she could instantly recall 64 memories of all mix settings, that is. The instant recall can save EQ, effects and even settings from the 50 on-board compressor/limiter/gates units. Both the psychic and the O2R will take you back in time ... but the O2R can be synchronized to SMPTE or MIDI timecodes for mixdown automation. • And while MIDI control is supported by all parameters, Miss Junebug is supported by paranormal amateurs. Her psychic readings require an open mind. The O2R features an "open system" so it can be directly connected with digital multitracks like ADAT, DA88 and a variety of digital audio workstations! • Huffs Junebug. "I was using crystals long before Yamaha started using a large liquid crystal display to make learning the O2R easy. Sure, the O2R offers powerhouse 32 bit signal processing in a very compact dimension... but I deal in a different dimension altogether."



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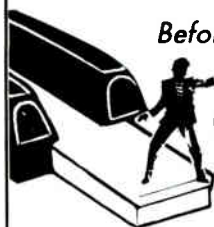
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LIVE SOUND

29x14x12-inches. Side-angles allow it to serve as either a full-range array module, as a front fill or a floor monitor. Sound Image's large-format G-5 enclosures, using the same composite materials technology, are out this summer with the Jimmy Buffett tour and have been installed at the Hollywood Bowl.

Turbosound (distributed by Audio Independence, Middleton, Wis.) showed its new Impact line of contractor-friendly loudspeakers. Offered in three models, the Impact line features a new molded cabinet design that provides durability and stiffness combined with low weight. The Impact 80 (\$574) and Impact 120 (\$914) are two-way passive systems with 8-inch and 12-inch woofers, respectively; the Impact 180 (\$1,075) is a subwoofer (45 Hz to 150 Hz) design featuring a single 18-inch woofer. The two larger units feature Speakon NL4 connectors. All units feature built-in passive crossovers, integral handles and pole-mount sockets.

clude the TX2M floor monitor, which is loaded with a 12 and a 2-inch compression driver; the TX3, a similarly loaded small-format trapezoidal speaker; and the TX4, loaded with a 15 instead of a 12. These use a similar single-space processor, with the TX2P handling four bi-amp mixes. The speakers were powered with Yorkville's Audiopro amplifiers, which represent a similar level in price vs. performance. Yorkville's home page can be reached at <http://www.yorkville.com/networks>.

SIGNAL PROCESSING

JBL (Northridge, Calif.) introduced the Smart™ System, a \$695 software package for Windows that performs a wide range of useful acoustical measurement functions via a standard Windows-compatible sound card. The Smart™ system has obvious applications for sound system designers, and its low cost and ease of use recommend it to touring and theatrical sound engineers; the FFT-based system can use music as a test signal, enabling in-performance

analysis and correction. A Real-Time module offers 1- or 2-channel FFT-based spectrum analysis and displays results in logarithmic or linear frequency scales at octave, 1/2-octave, or 1/6-octave resolution. A Delay Locator™ displays and calculates necessary delays to align two signals for comparison, and a real-time transfer function graphically displays any differences, allowing corrective EQ to be set quickly and accurately. Multiple curves and delay settings may be stored and recalled, and a coherence function indicates unreli-



Yorkville TX systems

Yorkville (Niagara Falls, N.Y.) demonstrated the new TX8 concert speakers. This large-format, trapezoidal 2-box system is constructed of 13-ply Baltic birch and is equipped with ATM Fly-Ware™. The three-way TX8 has two custom BNC 15s, a horn-loaded Audax Aerogel 8-inch mid and a 2-inch BNC HF driver. The TX8S is a companion dual-18 subwoofer in an enclosure that also measures 24x24x50 inches. The system uses a single-rack-space servo-controlled self-calibrating stereo processor. As remarkable as the sound quality was the pricing of these speakers, with the TX8 listing for \$2,799 and \$2,199 for the sub. Other speakers in this line in-

able data. The Analysis Module offers various tools for displaying and analyzing stored acoustical data, including color displays of frequency and time domain information at various resolutions. Analysis functions include reverb time and early decay time calculation and high resolution analysis of user-defined "slices" of time and frequency domain information. Additional functions via software upgrades are promised.

New Frontier Electronics (New Hope, Pa.) introduced its DSP 2010-X precision audio analyzer, a 1U rack-mount measurement system that offers many functions normally found on larger, more expensive systems. The DSP

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LIVE SOUND

2010-X performs a range of measurement functions, including real-time spectrum analysis (linear and logarithmic modes), long-term SPL measurement and envelope mode, which enables RT60 measurement. An internal signal generator, a dual-trace audio bandwidth oscilloscope and a MIDI analyzer mode aid in troubleshooting and monitoring, and the system can control programmable EQs through its RS232 port. The system includes its own VGA card and will drive any standard b/w or color monitor. Price is \$2,995.

AB International Electronics (Roseville, Calif.) introduced the SUB3600 (\$2,599), a new 3-channel amplifier designed primarily for stereo systems with passive, full-range speakers and a single mono subwoofer. It provides 800 watts into 4 ohms from each of the two high-frequency channels and 2,000 watts into 2-ohm loads on the single low channel. Channels 1 and 2 may also be bridged. A derivative of the popular 9620 touring amp, the full-featured SUB3600 has three balanced in-

puts, each with ground-lift and selectable input sensitivity, detented level controls, and nine-segment LED displays. Built-in 24 dB/octave crossover filters on the inputs can be switched to one of four frequencies: 80, 800, 1,200 and 1600 Hz. Custom crossover frequencies can be specified.

BSS (Nashville, Tenn.) was showing an installer's version of the FDS-388 OmniDrive called the FDS-380. Priced



Klark-Teknik DN 4000

\$1,000 less, at about \$3,500, the FDS-380 has simple front panel instrumentation: LEDs for level and clip on each band, a preset indicator and a PCMCIA slot. Offering the same internal functionality as the original OmniDrive, the FDS-380's

60 user presets can be recalled via MIDI. However, due to the lack of front panel controls, the FDS-380 can only be programmed and updated from another FDS-388 using a MIDI dump, a PCMCIA card transfer, or by using a PC running BSS's proprietary SoundBench software. SoundBench is designed to be a system controller and also allows configuration of BSS's VariCurve parametric equalizers. BSS can be reached on the Web at <http://www.bssaudio.co.uk/bss/>.

Klark-Teknik (distributed by Mark IV Pro Audio Group, Buchanan, Mich.) introduced the 20-bit DN 4000 digital parametric EQ, priced at \$4,600. The stereo 5-band device offers high- and lowpass filters and high and low shelving, for a total of nine filters per channel plus up to 300 milliseconds of delay on each channel. The LCD shows the actual frequency response of both channels simultaneously. Three separate rotary encoders adjust Q, Frequency and Level, and dedicated switches under the display allow instant access to filters, gain and delay. Up to 15 DN 4000 units can be MIDI-controlled from one master. Also shown

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WHY: Feedback is the number one problem in most sound systems, and the old graphic equalizer solution to feedback doesn't make sense anymore. The FBX controls feedback automatically, without taking a big chunk out of your sound. Digital FBX filters are ten times narrower than graphic EQ filters, so you get more gain before feedback and a dramatic improvement in your sound.

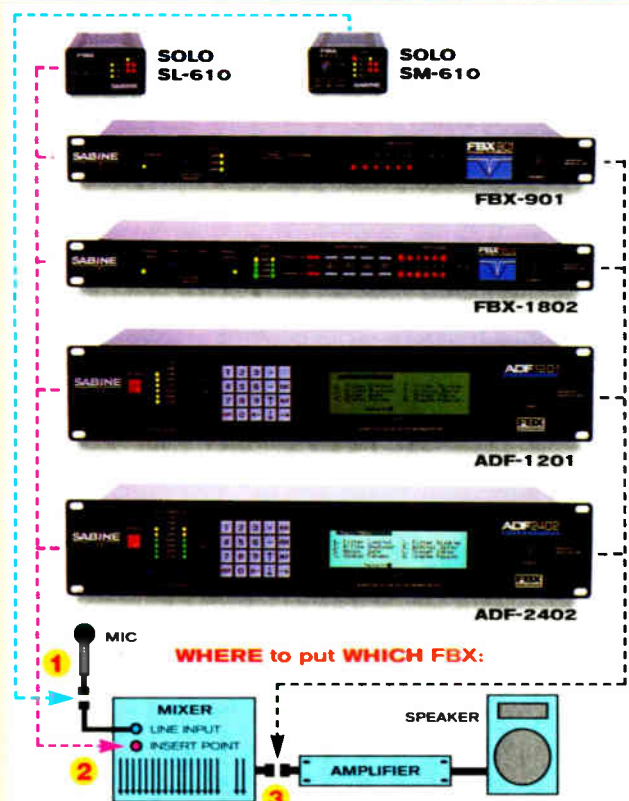
HOW: The patented FBX digital signal processor detects the feedback frequency and precisely places a super-narrow filter directly on the ringing tone, all in less than 1 second. FBX filters are automatically set just deep enough to remove feedback.

WHERE: FBXs are providing more gain before feedback in mains and monitors around the world. Theaters, concert halls, churches, conference rooms, and sporting venues all sound better with the FBX. Teleconferencing and distance learning centers also benefit from automatic feedback control and increased intelligibility.

WHICH: **FBX-SOLO Feedback Exterminators** — Choose the FBX-SOLO for targeted feedback control—one SOLO for one input channel: the SL-610 for insert points only, the SM-610 with a built-in mic preamp for mixers without inserts.

FBX-Feedback Exterminators — Use the FBX-901 for single output channel feedback control, or insert one on an input or sub-group; choose the FBX-1802 for two-channel applications, or when you want more control.

The new ADF-Workstations — The ADF-2402 is the ultimate feedback controller and digital parametric filter set. Control all aspects of the FBX algorithm, and program each of the 12 filters per channel as parametric or adaptive FBX filters. New features include graphic filter editing and Windows™ Remote Control Software. The ADF-1201 is the single channel version.



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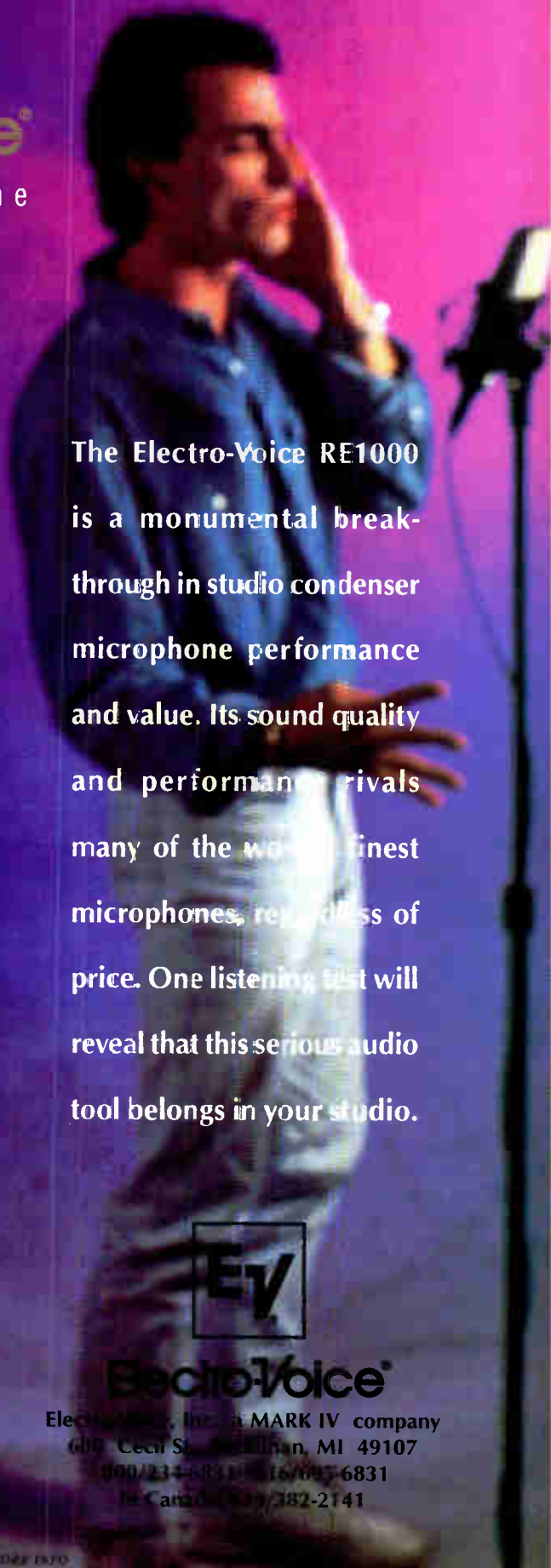
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whirlwind

LIVE SOUND

were the new DN 7103 and DN 7204 18-bit delay lines with built-in EQ, which list for \$2,250 and \$2,460, respectively. The 7103 is a 1-in/3-out delay line of up to 1.4 seconds; the 7204 is a 2-in/4-out delay of up to 2.7 seconds. Each output's level is digitally controlled and adjustable from +6 dB to -24 dB in 1dB steps, with a mute facility. Outputs feature two bands of parametric EQ, plus peak limiters. Delays can be displayed in units of time or distance (a temperature compensation facility ensures accuracy when in distance mode), and a master delay is provided on the input. All configuration and delay settings can be stored in non-volatile memory.



LCS LD-88

Level Control Systems (Toluca Lake, Calif.) introduced the SuperNova LD-88 digital mixer for theater, sound reinforcement and location-based entertainment applications. The 2U rack-mount 8x8 mixer provides 20-bit audio processing and features nine 32-bit floating point DSPs for 144 dB of internal dynamic range. Using the LCS NovaBus™, up to 16 LD-88s can be connected for 128 inputs and 128 outputs. Five parametric EQ filters can be assigned per input and six on each output, as well as up to 1/2 second of delay on each output. At a list price of \$17,500, it sounds expensive until compared with the cost of individual delays and EQs for eight outputs, let alone the cost of alternative automation and mixing facilities. The LD-88 supports RS-422, RS-232 and MIDI control formats, is equipped with XLR, 1/4 inch and DB-25 audio connectors and offers five external sensor inputs. Other LCS products in the works include the LD-16S, a 16-track SCSI record/playback card providing instant-start multichannel digital audio playback, and the LD-8SP, an 8-DSP board for effects such as reverb and multitap delays. The LCS Web site is <http://www.LCSaudio.com>

David Carroll Electronics (Rich-

mond, Calif.) demonstrated its Swing Rack front-access 19-inch rack system, which enables easy equipment mounting and access in situations where rear access is difficult or impossible. Available in single and paired configurations in standard 45U, 15U and 12U heights, the doors swing out like any hinged cabinet doors, and the steel tube frame ensures that racks stay plumb and square, even when fully loaded. An "oven door" version that swings down is available, and a rear-mounted frame kit allows additional rear-facing equipment or connector panels to be mounted. All visible hardware is finished in black textured epoxy paint. ■

SUMMERTIME TOURING TOOL CHEST

by Mark Frink

Professionals know that the difference between just getting the job done and doing it better than the next person often requires having the right tool for the job. Here are some equipment and application ideas that may help you provide better service this summer, and throughout the year. How many of the 20 tools on this list do you already have?

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LIVE SOUND

An extra FOH **graphic EQ** is always handy when visiting summer venues with center clusters, delays or lawn speakers. It seems there's always some third zone fed by a budget EQ, usually buried in the amp room. Set up a spare EQ and leave it permanently plugged into your last matrix out. You'll use this extra EQ more often than you think, and many times it will make all the difference in keeping the punters in "nose-bleed heaven," for whom the stage looks like a postage stamp, from complaining about how bad it sounds way up there.

Delay lines were once considered a luxury for touring sound systems. As the benefits of distributed zones in large venues and the alignment of sub-components of a P.A. are better understood, the additional cost of these devices is more easily justified. While many installations incorporate their own delay devices, the quality of older installed units may compromise the sound quality of permanent systems. Many older units have significant amounts of high-frequency skew and shallow noise floors,

making them acceptable only for non-musical public address applications. Carrying your own delay line allows you to bypass older delays installed in permanent systems, and to adjust the delay setting from the mix position.

Triple-tapped mono delays can be used in subwoofer amp racks to tailor the response of individual cabinets in sub arrays in millisecond increments. This can keep the lows from building up a power alley down the middle where the mix position usually is. Also, stereo delay lines can be used to delay the main hanging P.A. a few milliseconds to match the arrival of the live performance that is being reinforced and, with an extra pair of outputs, to further delay deck-stacked fill speakers.

Walkie-talkies for communication with the venue's house audio tech and the sound company's system tech are extremely handy, time-saving tools. A pair of dedicated sound department walkie-talkies for coordinating the audio resources of the facility and sound company can be a time saver for improving the sound of the system at its extreme reaches. These are important

—CONTINUED ON PAGE 228

NEWSFLASHES

Hollywood's House of Blues installed three BSS Varicurve programmable equalizers. BSS also reports that Phish's touring sound system, from Snow Sound (Berlin, CN), includes 14 FCS-920 Varicurves... Jands Production Services (Sydney, Australia) purchased 32 Meyer Sound MSL-4 loudspeakers. MSL-4s are also being used on contemporary Christian artist Carmen's U.S. tour. The system, which is being supplied by Blackhawk Audio of Nashville, also includes 19 of Meyer's 650-P subwoofers, 10 UPA-1C loudspeakers, 6 UM-1C monitors, 12 LD-1 remote control units and the SIM System II...Hootie & The Blowfish and sound company Special Event Services have agreed to a two-year relationship with Crown for the band's upcoming '96/'97 tour...Thunder Audio (Detroit) purchased a 40-input Soundcraft SM-24 console, as well as a 40-input Vienna II and a new K-1...NYC's Theatre Technology provided gear from Meyer, TOA and AKG for the Feld Ballet's spring performances at New York's Joyce Theatre...The premiere

of avant-garde composer Karlheinz Stockhausen's opera *Freitag Aus Licht* will take place at the Leipzig Opera House (Germany). The sound system for the event includes 16 Tannoy S300 12-inch SuperDual loudspeakers, two B400 14-inch SuperDual horn-loaded subwoofers, six CPA15s and three CPA5s. Two of the company's AMS8 near-field speakers will be used for monitoring the recording for a CD release. Tannoy SuperDual loudspeakers were also recently installed in Russia's Kemerovo Philharmony, the 1,200-seat concert hall where the State Symphony Orchestra of Siberia performs. The system was provided by Russian distributor MS-Max...JBL reports that its EON loudspeaker system was used for President Clinton's recent campaign stops in the Northwest...Royal Caribbean Cruise Lines recently installed Technomad WeatherTech Berlin loudspeakers in several ships. The speakers are being used for poolside performances by Calypso acts, as well as for parties and other fun functions. ■

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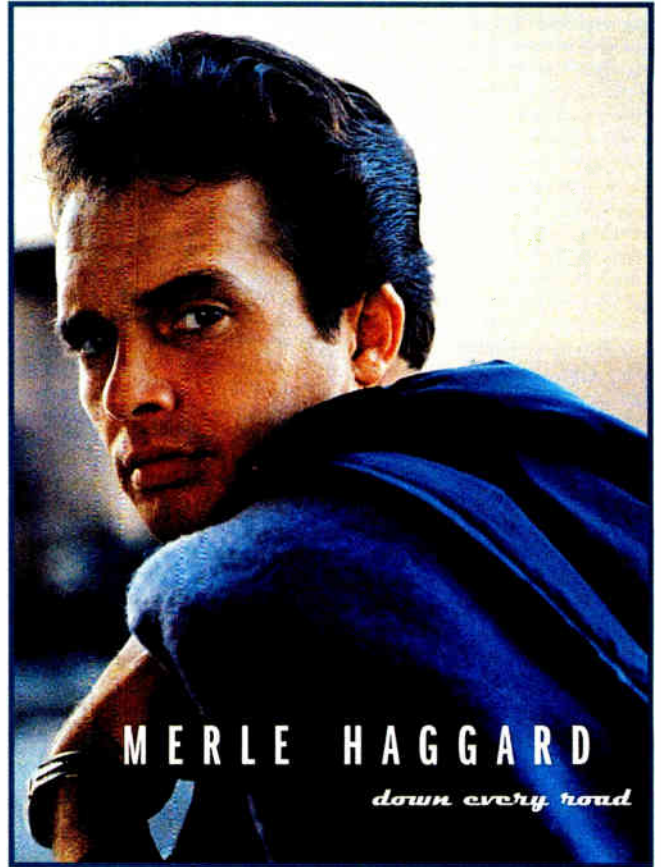
TALKIN'
RECORDIN' WITH
MERLE HAGGARD

by Robyn Flans

Merle Haggard thinks *Down Every Road*, the new Capitol boxed set encompassing his body of work from 1964 to 1994, is really quite wonderful. It contains never-released recordings and photos even he had never seen. His only question is why the record company never consulted with him on the project.

"I wonder what authority they have to pull rehearsals off tapes and put them out as masters," he ponders. "'White Line Fever' was never released as a studio cut; it was always a live cut we did in Oklahoma. We didn't put the studio cut out because it was no good. And here it is on there! Then it said, 'Everybody's Had the Blues' was a rehearsal cut they believed was done in New Orleans. The fact that they say 'I believe' is an admission that they didn't ask me. It *was* done in New Orleans, but it was never to be released. It was just us standing around rehearsing. I cleared my throat on one part.

"A lot of the stuff you're hearing are work tracks. I don't even think they have anyone down at Capitol who would know if they have the right take. Think about it—who would you call to ask, 'Is Merle's take seven on 'Swinging Doors' the right one?' I called the great Jimmy Bowen who was still in charge of the record label until about two years ago. I found out what they were



doing and he said, 'You've got to be kidding.' I said, 'I swear. I know my own records.' He said, 'We've got some young kids running things who don't know what they're doing. I apologize. I'll see if I can get to the bottom of this.' He was out of there six months later."

After 34 years of recording, Haggard just isn't sure he wants to do it anymore. Instead of technology creating an easier recording environment, Haggard relishes the good ol' days of cutting fast and live in the studio. And making his latest studio album, *1996*, released earlier this year, was an arduous task, which Haggard describes as among the most difficult sessions of his career.

"I guess it's just a matter of age," says Haggard, who

will turn 60 next year. Actually, though, it seems to be more about morale. Recording almost feels pointless to the singer/songwriter since country radio appears to have all but abandoned the genre's elder generation in favor of so-called Young Country artists.

"If we went into the studio with the belief that if we happened to hang something, they would play it, it would be different," Haggard says. "We don't have that going for us anymore. The reason for music is not the same anymore. It's not to listen to; it's to back bad videos. I think we've passed over a period and we may pull out of this sad sonofabitch we're in now, but it won't ever be like it used to be again."

—CONTINUED ON PAGE 172

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1996 Academy Awards
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1996 Grammy Awards
Patrick Baltzell, Designer
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Anton G. Forsythe, Executive VP, Strategic Product Development (left), and Gary Hardesty, VP, Engineering, led the team that created Virtual Line Array Technology.

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"TWISTED WILLIE"

RANDALL JAMAIL PLAYS OUTSIDE THE RULES

by David John Farinella

Considering what engineer Donnell Cameron went through during the recording and mixing sessions for the Willie Nelson tribute album, *Twisted Willie*, one has to wonder why he even picks up the phone when he knows producer Randall Jamail is on the line. Not only does Jamail go to all the trouble of recording live, without any type of digital effects, but it also turns out that even after hours and hours of engineering work Jamail has a habit of walking into the control room and changing the whole direction of the track.

Take the recording ses-



PHOTO: S. PETER LOPEZ

L to R: John Doe, D.J. Bonebrake, Exene Cervenka and Tony Gilkyson of X, who recorded the track "Home Motel."

sions for Jesse Dayton's take on the tune "Sad Songs and Waltzes" as a first example. Cameron recounts: "I spent a period of time getting a

great, really big vocal sound on Jesse, and I was really happy with it. Randall listens to it and says, 'You know, I think we ought to run this

through a notch filter. Make it sound weird and messed up.'" When a notch filter was not to be found Jamail

—CONTINUED ON PAGE 182

THEY MIGHT BE GIANTS

WITH SOME HELP FROM THOMAS EDISON

by Gina M. Costa

In the recording industry today manufacturers keep coming up with new technology in an effort to provide musicians with the best equipment to capture and sometimes enhance their performances. Many artists, of course, prefer the sound of older gear, but leave it to the quirky musical duo known as They Might Be Giants to take the vintage trend to its extreme. On their upcoming album, instead of using the latest technology, they used the *oldest*.

On April 27, bandmembers John Flansburgh and John Linnell went to the Thomas Edison Laboratory in West Orange, N.J., where they recorded several songs, at least two of which are to be included on their fourth album for Elektra Entertainment, due early this fall. According to Flansburgh, "We were intrigued by the idea of using technology from the past. We've long been using innovative, state-of-the-art recording equipment, so it was interesting to go so far back in technology."

Basically, what guitarist/singer Flansburgh, keyboardist/singer Linnell and three support players did was recreate an 1890s recording session. They recorded on wax cylinders, and the recording machine used was

—CONTINUED ON PAGE 186



PHOTO: CARIK KITMAN

They Might Be Giants in the Thomas Edison Laboratory

DEVO'S "WHIP IT"

by Blair Jackson

The late '60s gave us music for the revolution. But in the mid-'70s, five self-described "spud boys" from Akron, Ohio, gave us something *much* more interesting: music for man's de-evolution back to the apes. Ah yes, Devo. Get a load of the kind of stuff that the band's co-leader and mouthpiece—Jerry Casale—was spewing at the height of Devo's success in the late '70s/early '80s: "We're showing people a technique so that they can take everything around them, mutate it and deprogram themselves. That is de-evolution...Devo is designed to make new connections and disorient people's pat reactions to reality so they stop thinking like they're 'supposed' to think...We're providing entertainment for people who live an absurd, surreal existence...[People] know what they pretend to believe in is wrong and bad for them, but no one can seem to stop it. Everybody knows the smile face really has fangs and horns and that 'have a nice day' really means 'I hope you die.'"

Devo was cynical in the extreme, but also very funny. They were completely dead-pan at the same time they were overtly ridiculous—remember the red flower pot hats they sported in '80? How about the plastic Jack Kennedy-esque "hair" they wore for a while in '81? Then there were the bizarre short films (mostly conceptualized by the band and directed by Chuck Statler), full of bright primary colors, unusual lighting, odd characters (who can forget Booji Boy and General Boy?) and disturbing visions *years* before MTV. Their music was filled with robotic synthesizers and guitars that sounded like they were being strangled, and they thought nothing of completely deconstructing songs like the Stones' "Satisfaction," Johnny Rivers' "Secret Agent Man" and Lee Dorsey's "Working in the Coalmine" (which, coincidentally, is next month's "Classic Track"). But bassist Casale and lead singer/synth player Mark Mothersbaugh also wrote songs with memorable hooks and provocative and often ironic lyrics. The group made three truly great albums—*Q: Are We Not Men A: We Are Devo!* (1978), *Freedom of Choice* (1980) and *New Traditionalists* (1981), and they were easily among the best live bands



PHOTO: JEFFREY SACKEL/WARNER BROS.

to come out of the American new wave in the '70s.

Alas, with culture being disposable and all, most people today, if they know Devo at all, only know their one mega-hit, "Whip It," which came out in the summer of '80 and made it all the way up to Number 14, a nice breath of weird air on the radio waves. Devo purists would probably prefer I write about early oddities like the unforgettable "Jocko Homo" or "Mongoloid," but truthfully, I like the middle-period Devo that "Whip It" represents even better, so I'm happy to go with the predictable "Classic Track" for a change.

Devo's first recordings, made in 1975 for their own Booji Boy Records label, were made in Akron using Bob Mothersbaugh's Teac 4-track. Then, when they started to attract a sizable cult following, Devo was signed by Warner Bros. Records and packed off "to this wild German studio where Kraftwerk and Can and all these strange German bands had worked," Mark Mothersbaugh remembers. Brian Eno and David Bowie, who were in the midst of making their strange and state-of-the-art late-'70s electronic art music trilogy (*Low*, *Heroes*, *The Lodger*) in Berlin, signed on to work with Devo, though Bowie's involvement ended up being minimal. "Brian was incredibly patient with us when you consider how artistically neurotic we were at the time," Mothersbaugh says. "He was a really good father figure for us at a time we

definitely needed someone." Mothersbaugh notes that in Eno's original mixes for that album "he usually had two or three of his own synthesizer parts on there, but we ignored them and used only our own stuff. We were very insular and had our own ideas about how we thought it should sound." Today, Mothersbaugh muses about how the Eno mixes would be received, "but I'm not sure Brian would take my call."

For the second album, *Duty Now for the Future*, the band considered several top producers, including Eno, Giorgio Moroder and Tony Visconti, but went with Ken Scott, who had worked with The Beatles and Bowie, among others, and was known as someone sympathetic to musicians' needs. He brought the group into the now-defunct San Fernando Valley studio known as The Chateau and proceeded to change the way the band recorded: Instead of essentially playing live, Scott had the quintet build tracks, up from Jerry Casale's bass and Alan Meyers' drums, then layering Bob (Bob 1) Mothersbaugh's guitar, brother Mark's synths, and Bob (Bob 2) Casale's guitar. The result is sonically solid, but the performances are a little stiff and the material uneven.

So that brings us to the end of '79. The group had enjoyed considerable popularity outside of the U.S. and been around the world on tour twice. Their following in the U.S., while still building slowly on the strength of their live

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show, had not expanded much beyond a hardcore new wave base. For their third album, *Freedom of Choice*, they selected Bob Margouleff—who'd worked with early electronically oriented groups like the Neo Original Timbral Orchestra and Lothar & the Hand People, not to mention Stevie Wonder—to co-produce with them. "The one thing I know I learned from the experience of the first two albums is that I didn't know how to get the sounds I wanted to get," Mark Mothersbaugh says. "After each of the first two albums I felt, 'Crap, I don't know how to do it.' I'd hear the record and flinch instead of hear it and be excited. Now isn't that terrible? I should have had a therapist back then to help me out. So by the time we got to the third one, we were already shell-shocked and didn't know what to expect.

"We were the best live onstage. In the studio we always tended to over-conceptualize our music. By the time we got to the third album we had this concept we'd been talking about for a while, which was to do an album that was sort of rhythm & blues techno music. There wasn't really anything like that around then. Our influences when we were younger were mainly rhythm & blues. And the earliest stuff we did, Jerry and the guitar players would do blues licks and then we'd write parts for the drummers—first my brother Jim Mothersbaugh, who built one of the first drum machines and ended up getting sucked up by Roland, and then Alan [Meyers]. Now whether somebody would go back and listen to *Freedom of Choice* and crack up thinking of that being our concept or not, that's up for debate. But coming from our perspective, it was as rhythm & bluesy as we'd ever been in our lives. The songs were dancey, which you could never really say about 'Uncontrollable Urge' or 'Jocko Homo' in 7/4 or 'Blockhead' in 11/4 time."

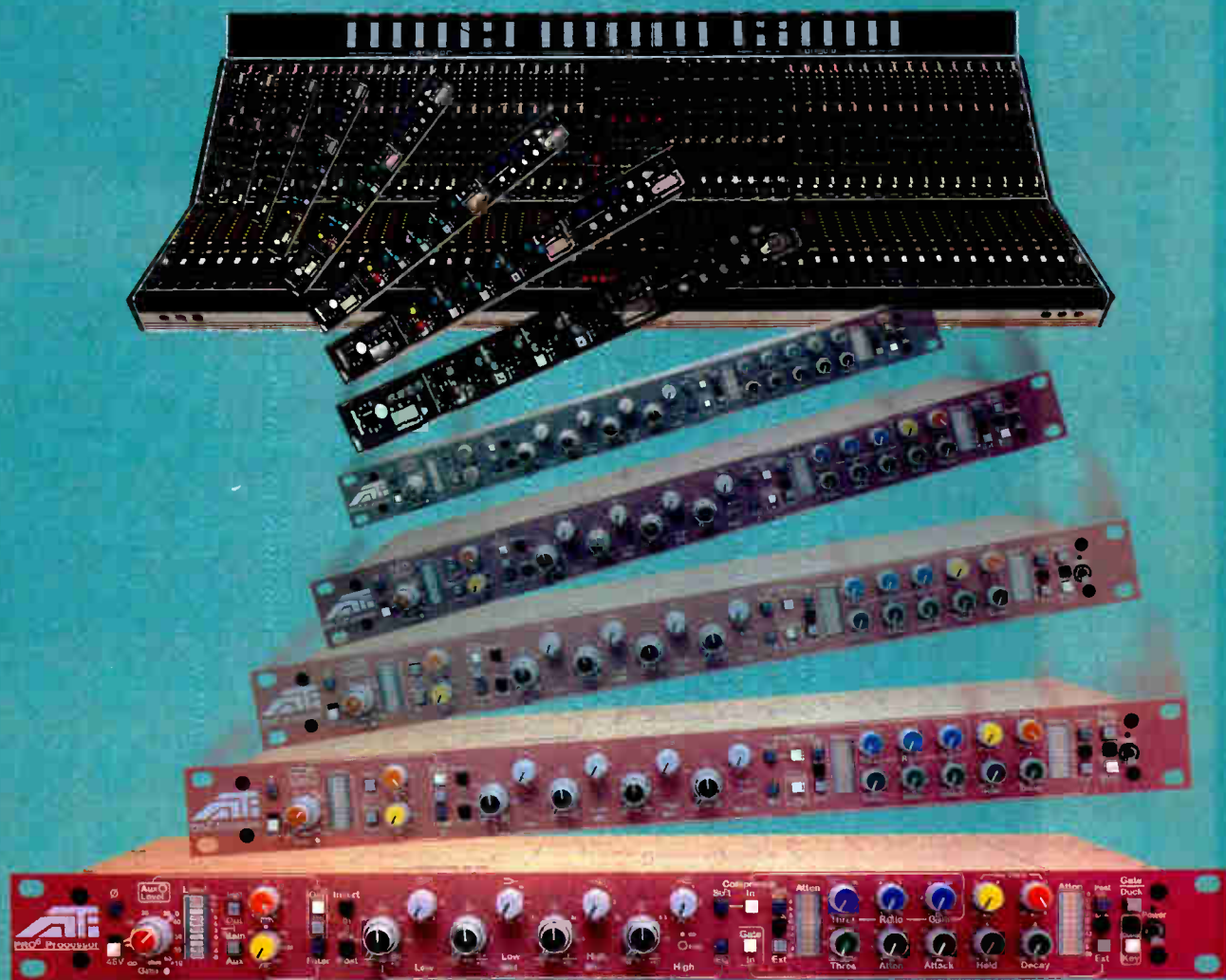
Margouleff took the band into the Record Plant in L.A., "and the biggest thing I can say about that album is it was the first time where after we heard stuff we all felt pretty good," Mothersbaugh says. "Maybe some of it is that we'd relaxed a little about how uptight we were about our aesthetic, but I also think it was better realized from our standpoint. The third album was also the first where we had all new songs. We had a period of time where we toured a lot and we had a chance to percolate as a band, too. We actually became really good players by the time



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we did *Freedom of Choice*." The band returned to playing mainly live in the studio; indeed, for all the technological sheen in the grooves, there is little there that the band wasn't able to reproduce live as a five-piece.

The music for "Whip It" evolved from some jam sessions Mothersbaugh played with Captain Beefheart drummer Robert Williams: "I got him to play a few drum tracks for me and then I'd take the tape home and I could play along to it in my bedroom, where I was writing the music. By 1980 I had a Prophet 5. At the time we were talking about music for this song, the band was rehearsing at a place called Modern Music off Sunset, and the five of us would get together and play in this room every day. I brought in some music and Jerry brought in some lyrics. I think 'Whip It' actually started off as 'Dump Truck'—that's what I'd written for it. But Jerry ended up doing the lyrics for it."

What inspired Casale's surprisingly optimistic anthem? "One of the things we'd noticed when we were out around the world was people were saying 'Your president is such a wimp. Carter sucks. He vacillates back and forth,'" Mothersbaugh says. "So then the song sort of turned into this Dale Carnegie 'We can do it if everyone pulls together'-type feeling. 'We can solve these problems!' And then we put it with this sort of aggresso dance beat."

Freedom of Choice was recorded mainly in the old (Third Street) Record Plant's small Studio B, with some additional work in the large Studio C. Both control rooms were equipped with SSL E-Series consoles and Studer A800 24-track recorders. Bob Casale was the principal engineer on the record, though Mothersbaugh notes that Bob Margouleff "helped us with things that we hadn't been aware of on the first two albums, like the fact that you can play a synthesizer or even a sequencer through amps out into speakers and then mic that; I thought that was really clever—it sounded so good. Or even taking a direct bass line out of the board and blowing it back out into an amp. We didn't know about that kind of stuff." Margouleff also taught the group how to mix the signals from different amps together, creating one sound from two or three sources.

As for the propulsive main riff that is the song's signature, Mothersbaugh says, "The big technological thing we did is rather than just using a Prophet 5, my brother Jim, although he wasn't performing in the band anymore, mod-



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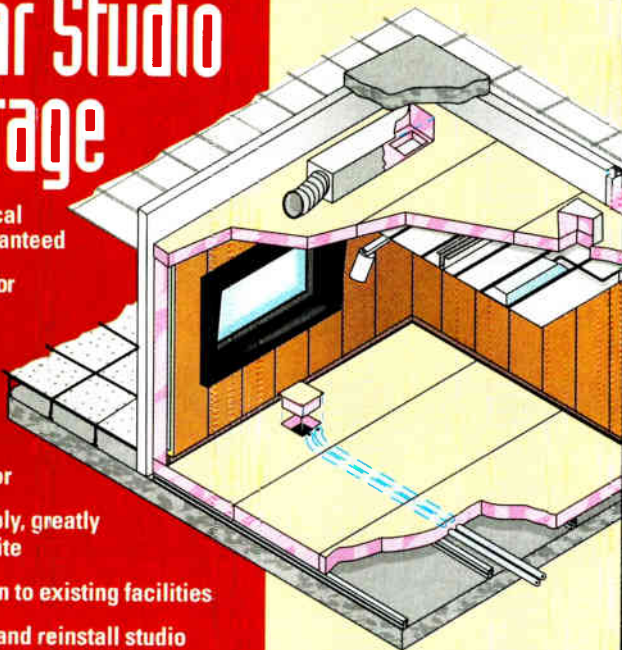
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ified all our synths and guitar racks and he had modified two Minimoogs so you could trigger them at once, so we had—count 'em!—six big oscillators on the bass line. So that had a lot to do with the bass lines being what they were on that album." The whip crack sound was created by using a percussive synth pad with a fast attack run backwards on tape.

Mothersbaugh says that the sessions for the song and album were relatively uneventful. "The Record Plant was a totally cool place. It was a little rock 'n' roll for us. Rod Stewart was working there at the same time we were, and we made fun of that world to a certain extent, but at the same time it was cool. There was a hot tub room, rooms for groupies. It was great!" The only crisis that occurred during the recording came when a winter storm dumped so much rain on L.A. one day that the studio was flooded with six inches of water. "It was the only time the Record Plant ever shut off their power until they closed down [years later]," Mothersbaugh says, but there was no lasting effect from the flood.

The first single from *Freedom of Choice*, "Girl You Want" created a bit of a stir but wasn't a really a hit. "Then," Mothersbaugh says, "we went to Europe, and while we were over there they released 'Whip It' and that was a different story. When we came back I took it as a good omen because Carl's Jr. [the hamburger chain] had plastered all of Southern California with these big billboards with four hamburgers on them and in giant letters above the burgers, 'FREEDOM OF CHOICE.' All right, free advertising! It was perfect for Devo." "Whip It" became the best-selling single in Los Angeles in 1980, selling more than 300,000 copies there, and of course many more nationwide. The album ended up going Gold, which ended up being a mixed blessing for these iconoclasts.

"We were under the radar screen at Warner Bros. for the first two records," Mothersbaugh says. "They had the reputation as a pretty cool label. They'd let Beefheart do a lot of records, and they had art bands on that label. We weren't costing them very much; in fact they made money off of us. So that was great. But then when the third record was so successful, the record company started to look at us totally different, so when we did the next album, *New Traditionalists*, it was like 'Hey, do anything you want, but do another 'Whip It.' We had managers on our neck and

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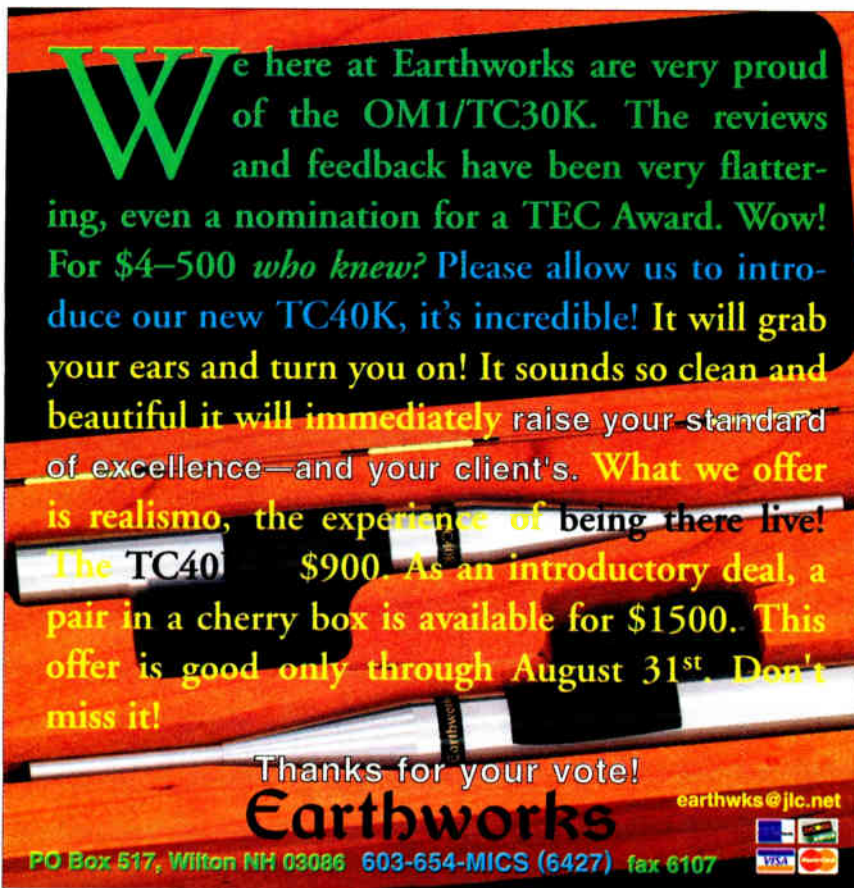
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record company people that would show up, and we were very shy about all that business stuff.”

The band never quite recaptured that kind of glory again, though they went on to make more fine music, and the group's members still work together, while also doing their own projects. Mark Mothersbaugh runs his own music house, called Mutato Musika, and has scored numerous commercials, TV shows and feature films. (For more on MM's recent career see *Mix*, January '95.) Bob Casale produces and engineers at Mutato, and Bob Mothersbaugh is also in the scoring game. Jerry Casale directs rock videos and has spearheaded a forthcoming Devo interactive CD-ROM called *Adventures of the Smart Patrol*, featuring old and new Devo music. Who would have guessed that more than 20 years down the line, Devo would still be (d)evolving successfully? ■

—FROM PAGE 162, MERLE HAGGARD

With great pride, Haggard still recalls the times he recorded four hits in one three-hour session. “In those days, we had three hours to record, so sometimes we'd meet at Dupar's down the street from Capitol 30 minutes prior to the session. I'd have all of these talented people appear in front of me—[guitarist] Glen Campbell, [pianist] Glenn D. Hardin, [drummer] Jimmy Gordon—and Merle Haggard was paying the bill, so Merle Haggard got thirty minutes to make these guys understand what we intended to do.

“Sometimes I'd have a little demo tape I'd play them. Most of the time it would have been something I had written too recently to have made a demo. I would take a guitar and say, ‘Here's the way it goes.’ We didn't write sheets in those days. People learned the song, we tuned up to the piano—there was no such thing as electronic tuners. If the piano happened to go out, it would go out, and barometric changes could do it. But Capitol was good about that. They kept things in tune and they had tuners come in during the night, so when we got there, the room was kept meticulously at the right temperature. You could leave your instruments there and a guard would watch them overnight. Nowadays, you'd be afraid of a drive-by shooting or getting from the back of the studio safely to your car without getting killed,” he laughs. “If we were recording three days in a row, everything would

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really get good about the second day because we could walk in and our things were set up and in tune."

He cites "The Fugitive," his first Number One song (1966), as one of the "most in-tune records I've ever heard in my life." And he cut that song four times before settling on the Hollywood recording. "We put a mute across the piano strings on ol' Glenn D. Hardin's piano," he recalls. "That's how we got that sound. We wanted a repetitious raindrop sort of thump that wouldn't be annoying. We came up with that because we were talking about a guy that was walkin'. And at the time, *The Fugitive* was a big series on television, so the song was very timely."

Haggard's first records came out in 1962 on the Tally label, and he remembers that in that era. "Some of the first things I did were recorded on 2-track. It was just about that time they started experimenting with 3-tracks. Our sessions were like two months apart, and it seemed like every time we went into the studio, it leaped a track or two. It was 3-track and then 4-track and we said, 'Wow, four tracks! We'll be able to put harmony on one track and...' We began to use our minds on how to utilize it." Haggard signed with Capitol in 1965, the same year he formed his backing band, The Strangers. "From 4-track, it went to 8-track and we thought, 'Man, where can it go from here?'" he recalls. "We were going into Capitol and watching them wheel these obsolete machines out before they were ever used."

The Academy of Country Music's 1965 Female Vocalist of the year, Bonnie Owens, (who was married to Haggard from 1964 to 1978 and still sings harmony with him) recalls her favorite studio memory as the cutting of "Swinging Doors" in early 1966. "We had done about five or six takes, but had to stop because it wasn't happening," says Bonnie, who helped arrange the harmony parts in the studio. "Jerry Ward, me and Merle tried other mics, but it didn't seem to work; we couldn't seem to get the feel or spirit. So in the end, the three of us went around one mic. Merle thought of it because he said, 'That's the way Bob Wills did it.' Standing around the microphone, getting the chills down our spines, we knew this was the take. It was a first take after we gathered around the one mic."

Owens remembers that overdubbing entered the Haggard picture after "Okie From Muskogee" and "The Fightin' Side of Me" were cut in 1969. Hagg-

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gard was not a huge proponent of the process, nor was Haggard's producer at Capitol, Ken Nelson. "But I didn't like to record him because I was so enthralled with his voice that I would sit there and listen to it and enjoy it," Nelson laughs. "That wasn't good because sometimes I wasn't paying attention to what was going on in the background. I loved his voice. All I did was sit in the booth next to the engineer and tell him when certain things were coming up. For instance, what the background would be—if it were steel guitar behind him, I would tell Hugh [Davies] and we would adjust it accordingly so we could understand the lyrics, unlike today where you don't hear them; all you hear is the drums. I sat there and decided if a record was okay, if Merle had put enough feeling into it, and Fuzzy [Owens, Haggard's manager] would help out in that area and guide Merle's singing, up to a certain point."

"Ken Nelson was so good to me," says Haggard, who always had the final say on recording decisions, but notes there were never disagreements anyway. "He was such a great man to let me be myself. He never got in my way or suggested anything. He'd just sit there and listen and make sure we were in tune. He'd call out the numbers: 'Take two.' I thought he was crazy for a while. I thought, 'This guy doesn't know whether I'm doing any good or not because he's got his glasses down on his nose; he's from Chicago, he played in a big orchestra up there, so what does he know about a guy from Oildale?' Then I went in there and this old man was so wise and he was so helpful. He stepped out of his role in a lot of areas and tried to get me with the right people, financially, and did things for me. He was sort of my father around there for a while and I love him," says Haggard, who lost his own father at age nine.

"Fuzzy Owens and Ken Nelson sat in there producing," recalls Bonnie Owens. "Merle kind of left it up to me, too. If I got cold chills on my arm while it was happening and he got all the way through the song, that was his gauge of a take. They'd play it back and see if anything was a problem. If not, that was it. If everything was right, Ken would say, 'A joy to hear and a sight to behold.' Everything seemed so easy in those days. I don't like to record now. The magic there was the oneness that the whole group had. Merle didn't have a big group—drums, bass, the harmony singers, everybody in the

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same room. It was like we were in a little club, performing this tune."

"They didn't use earphones in those days," recalls Hugh Davies, the engineer on all of Haggard's Capitol recordings except *Okie From Muskogee*. "Everything was live. They could do it because they were a band that played together, and they knew every lick that was happening. It was pretty standard recording—no gimmicks, straight ahead. He let the song speak for itself; he didn't have to do anything fancy—no guitar delays, just steel guitar, rhythm guitar, lead guitar, keyboards and great songs. He'd sing and then add his fiddle later. "He liked to play the fiddle, but he was really, really bad at it. He got good later, of course, but in the early days, he'd try and try and then say, 'Take that out.' I'm sure some of it is on some of the outtakes, but none of the early stuff really made it to record. I don't think."

The session for "The Bottle Let Me Down" (1966) is one of Haggard's favorite studio memories. "I remember James [Burton] standing on a kitchen chair with his eyes closed because he was just grooving, playing that guitar so good. It was a great performance; there was no reason to do it anymore. We

played it back and said, 'Put that dude out.' I was amazed with that record. The only thing I felt was that it was too thin. Back in those days, they didn't let you turn the bass up because the juke box operators wouldn't give you a second buy if you had too much bass on the record. If you had too much, it would knock the needle out. So there wasn't much bass on the record, but I listened to it and thought, 'Well, maybe it's all right. The harmonies are so good.' I was very proud of putting that record out."

The session for "That's the Way Love Goes," (written by Sanger D. Shafer and Lefty Frizzell), which earned Haggard his only Grammy, in 1983, is another fond memory for the singer: "I went into the studio in Nashville at ten o'clock with a little five-piece band, and at one we walked out and we had four songs, including that one. Reggie put on a second part on his guitar solo, but there was not even any harmony on my voice, so that was the only punch-in that was done, and it was done immediately on the first playback. We listened, we walked back in and said, 'Is that a Number One record, or am I crazy?' And we said, 'Probably both.'"

Some of Haggard's MCA catalog was produced by Jimmy Bowen, including "I Think I'll Just Stay Here and Drink" (1980), which Haggard insists is *not* autobiographical, and "Leonard" (1980), about songwriter Tommy Collins. "I loved working with Jimmy Bowen," Haggard says. "A lot of people hated him, and he and I were so different, but we got along so well in the studio. He was the first guy I ever agreed with that had ways of doing things. Until I met him, I didn't put songs into groups; I went in there and said, 'Okay, this song we'll record this way,' but after I worked with Bowen, I grouped things up. He wouldn't use fiddle, for example, or steel on a record until after the vocal was already on it because it would influence the vocalist. That's a very important thing to know. When you got something moving around underneath you that's a pitchy instrument—anything that doesn't have a fret—it might interfere if you're laying a serious vocal track."

Haggard considers "Misery and Gin" (1980)—also for MCA, but produced by Snuff Garrett—his most unusual session. "We had 100 players in that room. There was every player in Los Angeles

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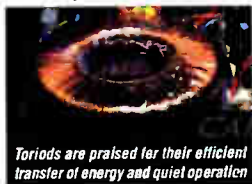
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that was any player at all," Haggard laughs. "John Hobbs played the piano, all these great guys in a row were playing rhythm, including James Burton. Emory Gordy was playing electric bass, somebody else was playing upright bass. There were two keyboards, plus the piano, 80 strings, an oboe, percussion, drums, kettle drums, everything you can possibly think of. They had a big podium up there with the words to the song. I didn't write it and didn't know it, but the guy who had sent it to me said it was going to be in Clint Eastwood's next movie. Snuffy said, 'Haggard, go out there, I'll let you do it maybe two times. We ain't got the time

to keep all these people here.' I said, 'I sure agree with that. Let's do it.' We went out there, and 100 people hit that sonofabitch and played it right. We cut it twice, and they kept the first take."

If Haggard does go back into the studio again, he says it will have to be considerably simpler than most of his recent sessions—in fact, he wants the sound totally stripped down again. "Willie Nelson and I are planning to do an album together, just the two of us," he says. "There's been some talk about a record and a tour where Willie and I are by ourselves, with just our guitars, no hands." Never shy about speaking his mind, Haggard adds, "The worst

thing they do now is sampling. They sample Larrie Londin's snare drum and put it on top of whoever is playing, and I think that's criminal. God, how could you do that to somebody who is dead and gone? It seems to me that ought to be personal. That would be like sampling my voice and giving it to some young kid who didn't hit his note just right. There's no decency left in this business.

"I wasn't really interested in technology," he continues. "It got to be where I thought, 'If it gets any cleaner than this, the humanity is going to leave.' And it did. Now you hear things to a degree that would never occur in reality, for example, the way there are five or six microphones on a set of drums. As the drum is hit with all this force, here's this microphone an inch away from the drums, and here are all these microphones that are isolated and each individual instrument is being recorded, but here you are with two ears. Nowhere on God's earth are you ever going to come by a condition where you're going to hear this like you hear it on a record. There's nobody that's ever going to be able to reproduce it the way you hear it on record, so anything you hear live is going to be less than the record performance, so in the critical areas of pitch, people will have problems. It's serious when you sing that straight with no vibrato and you get it perfect on record, but you can't do it perfect every time live. They've placed the mark on the wall at an unbelievable height, and you can't kick that high in public."

Haggard still pleases his audiences, although even touring conjures up mixed emotions these days. "I have a young family now," says Haggard whose fifth marriage has produced Janessa, age 7 and Binion, age 3½. "When they came into the world, I said, 'I've really been given a second chance to be a father. My first four children by my first wife Leona are grown, and I didn't get to watch them grow up. I think some of their lives are messed up because of my failure to be there,' he says. "I got this little guy calling me every day—he's 3½ years old, and I'm here in Kentucky, hurtin'. I'm torn between that and the love of the music. I do love the music, though, and always will."

Special thanks to Bonnie Owens, whose help in securing some of these interviews was invaluable. ■

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An open letter from Morris Ballen, Disc Makers Chairman

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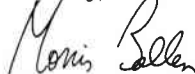
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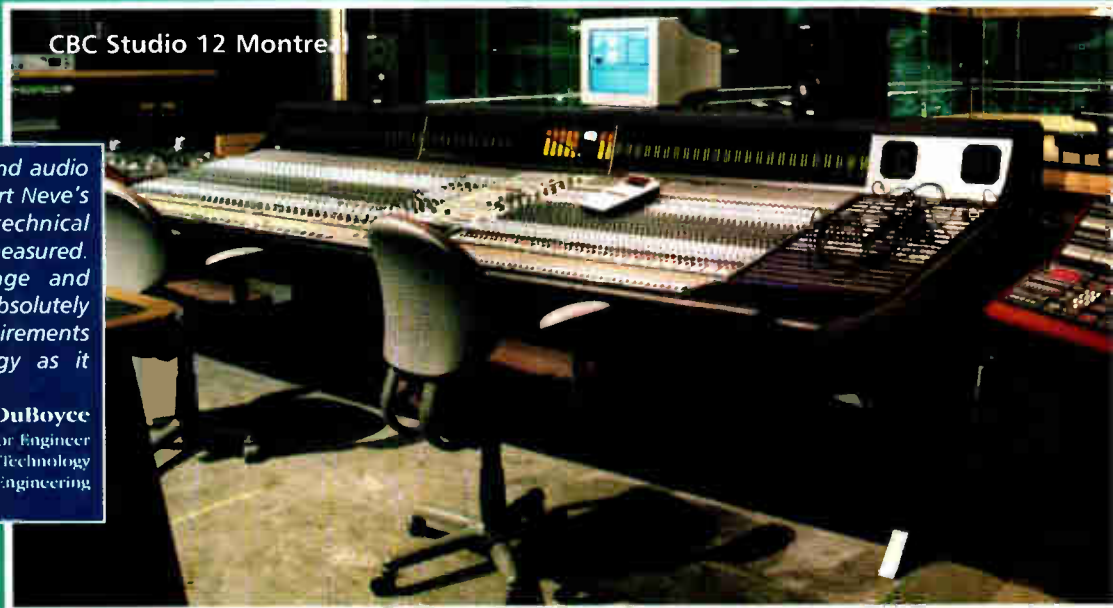


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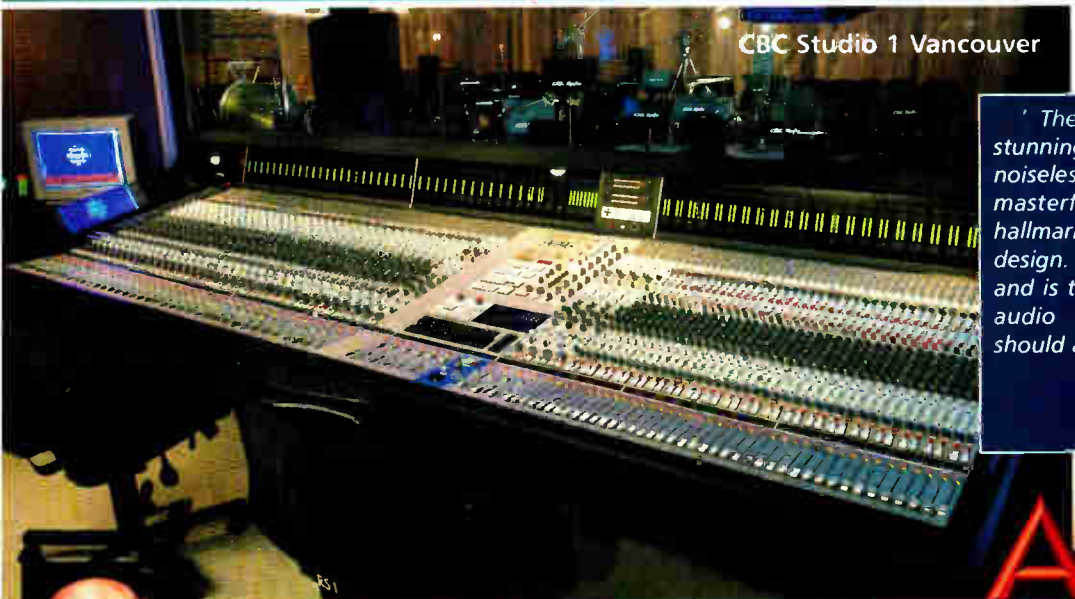
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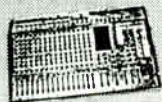
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—FROM PAGE 163, "TWISTED WILLIE"

looked around and suggested that they run the signal through a telephone instead. "Then Randall goes, 'That's not weird enough. Let's run it through a Leslie.'"

Rather than jumping to his own defense Jamail says, "Yeah, he got a great vocal and he recorded it beautifully. If you hear the original track, it's a gorgeous vocal that Donnell got," and then he takes a breath, starts to laugh, and finishes, "I f—d it up, which is really my forte."

Apparently so, since it was not the only time during the *Twisted Willie* sessions that Jamail took a morning's worth of work and tossed it. During the mixing session for Steel Pole Bath tub's contribution, "The Ghost," Cameron

**The only way
to tribute Willie
was to let these kids
do whatever the hell
they thought
these songs should be.**

—Randall Jamail

says, "I spent quite a bit of time getting a great drum sound; it went real quick, and the band was great. When it came time to mix I was bringing up the drums and Randall walks in and says, 'How about if we put those drums in one speaker?'" And rather than throwing the tracking sheet in his face and walking out the door, Cameron apparently did it, and now says of the idea, "It worked very well with the arrangements, and the drums just ended up sounding real far away."

Although those times were challenging, it was nothing compared to the day when Kelly Deal strolled into Ocean Way Studios in Los Angeles and announced to Cameron that she wanted to use only guitar feedback and a sewing machine for her track. "When Kelly told me her concept for the song was to have orchestrated feedback where the chord changes of the song were created by interweaving layers of guitar feedback, I thought, 'How many weeks do you want to spend on this?'"

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John Carter Cash and Johnny Cash

says. "I found an old Electro-Voice 646 microphone and we set that up. Then we had to slow it down using VSO on it. We actually ended up bouncing it onto her Portastudio and back to 24-track and then back to the Portastudio, cranking the VSO down as low as it would go every time." They finally got it down to the right tempo, which took four bounces, and then they started on the guitar feedback tracks. Seven tracks of feedback later, the track was a mess, according to both Jamail and Cameron. Then, all of a sudden, Kris Kristofferson walked through the door.

"He didn't say it, but he looked at me and I knew what was going through his mind was that I had lost mine," Jamail remembers with a laugh. "But he hung in there and he tried to listen to what we were trying to do." In the end they threw him into the room with a headphone mix filled with the sewing machine and feedback tracks and asked him to track a harmonica part and an ending vamp vocal. "What he didn't realize was that right after he left we decided to get rid of the feedback tracks and leave it very open and sparse," remembers Jamail. "I ended up taking his harmonica track and running it back through the Leslie cabinet, and the song became what it became."

While "Angel Flying Too Close to the Ground" is the most, um, interesting interpretation of a Nelson classic, it fit in perfectly with what Jamail's vision of the album should be. "It was, from the beginning, our intention to have the artists interpret these songs as if they were a part of their own repertoire," Jamail says. "The only way to tribute

Willie was to let these kids do whatever the hell they thought these songs should be. That's what Willie did 30 years ago, and so for them to do anything other than just reinvent the song in a way that is consistent with the kind of music they are making would have been a sham to Willie."

Now, actually implementing this concept proved a little more difficult than thinking it up. Fourteen of the album's 16 tracks were recorded in five different cities over eleven months, a process made easier because of Jamail's good instincts for matching the right studio with the right project. The majority of the tracks were mixed by Cameron and Jamail at Ocean Way in Los Angeles, while recording sessions were scattered from Seattle's Bad Animals to Nelson's former studio, Peder-nales, in Spicewood, Texas, to Hyde Street Studios in San Francisco. The track by X, "Home Motel," was recorded at Cornerstone Recorders in Cinatsworth, Calif., and Waylon Jennings' "I Never Cared For You" was done at Revolution Sound in Nashville. Jerry Cantrell's version of "I've Seen All This World I Care to See" was actually captured in his bathroom by his guitar tech Darrell Peters, while "Shotgun Willie," the Tenderloins track, was recorded at Red House Recording in Lawrence, Kansas by Ed Rose.

Because he likes to record live with minimal, if any, overdubs, Jamail prefers a good-sounding recording room, but he notes, "For me, the limitations are born out of what kind of equipment a studio has and not necessarily the room size. On the equipment side, there are

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certain control boards and tape machines that I always try to have available when I'm recording." Specifically, he looks for either a Neve 8068 or 8078 Series board and a rack of API 5031 EQs. "If I'm going to record on a Neve," Jamail comments, "I'll always keep a rack of APIs handy, because guitars and stringed instruments are very friendly through the API EQs.

"I consider the critical issue for the kind of records I make [to be] the interaction between the musician, the musician's instrument and the microphone. That's where the sound meets the vehicle that's going to record it," he says. "It has to start on the production end with the right microphone, and that always changes, it's never fixed." Jamail travels with a wide variety of vintage tube microphones and a number of condensers to make sure that wherever he goes he knows that the mic is going to work.

Jamail notes that he also prefers to mix in studios that have "live chambers, plate reverbs and additional analog machines for us to create the kind of effects that we want for the record." In fact, during mixing sessions at Peder-nales, Cameron says, they had to re-vamp the studio's echo chamber since it had been hardly used.

It's that sonic outlook that has pulled Cameron and Jamail together. "Randall and I share a similar philosophy of recording, in that we believe the fewer electronics you put between the microphones and the tape machine, the better," Cameron says. "You spend a little more time achieving what you want, but I think the end result is well worth it."

Indeed, Jamail echoes, "To me, the fun and the creativity of recording and mixing is utilizing things that save the emotion and the mood of the music." ■

—FROM PAGE 163, *THEY MIGHT BE GIANTS*

an Edison studio phonograph from 1898. For playback another Edison phonograph, from 1906, was used. The two horns chosen for the session were a small horn for the vocals and a long horn for the instruments. The recording engineer for this session, Peter Dilg, notes that "There was no electricity used. Everything was powered by acoustical energy." Jerry Fabris, curator of sound recordings at the Edison National Historic Site, explains, "The phonograph is powered strictly by acoustical and mechanical energy,

which is basically what they had to record with before there were micro-phones."

How does the Edison recording process actually work? "The sound pressure from the voice vibrates the air in the horn and as the horn funnels down to the phonograph, the shape of the horn compresses the air," Fabris explains. "At the end of the horn is a piece of thin material that vibrates; the sound pressure that's hitting that material causes it to vibrate. In the center of the diaphragm is a stylus, which is touching the wax cylinder. As the cylinder turns, the stylus is cutting the wax and creating sound waves. On the recording machine, the stylus is a knife shape so it's actually cutting the wax and making a groove in the cylinder.

"Playback is the exact opposite. The phonograph that's playing the cylinder back is the same setup except that the shape of the stylus is a smooth ball shape, instead of a knife shape. So you put the finished cylinder on there and you run the stylus over it the same way as you did when you recorded, except this time instead of cutting the wax, the ball-shape stylus rides over the sound waves that are already in there, and that vibrates the diaphragm, disturbs the air on the horn and causes the air in the horn to vibrate. So the air in the horn gets pushed out and into the room for you to hear."

The band allowed a live audience to sit in on the recordings. They scheduled three 40-minute sessions throughout the day. What the audience heard that day was what an audience back in 1898 would have heard. Nothing had been done to the equipment. Fabris comments, "It was all original equipment. Some of the parts that deteriorate over time, like rubber gaskets or leather brakes, had been replaced, but they were always replaced with the same type of parts." The band had no fears that the equipment, old as it is, wouldn't work. The Edison staff has not only maintained the equipment meticulously, they have also had other notable musicians record with it over the years.

The first person to record there with Edison's equipment was Wynton Marsalis, back in December 1993, and Les Paul recorded there in August 1994. Dilg was the recording engineer for both of these sessions. Fabris states, "Every time we used pretty much the same equipment, except we've tried different horns because Edison experimented with many different shapes and

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sizes of horns, and we have so many to choose from. So each time we do this, we try different horns just to see which one works best and compare results."

Each wax cylinder only holds two minutes of information and runs at 160 rpm. "We had to shorten the songs to fit them," Flansburgh says. "For most bands that would be a problem, but for us it's par for the course." They did about a half-hour of test recordings beforehand, but that's it, Dilg says. "We tried to set it up the way they would have in the old days. The vocalist was right in front of the horn. The tuba player was pretty far back. The guitar players were up close to the longer horn. After we heard each recording played back, we could make adjustments for the next one. So if the singer was too loud, he would simply back up a little more. This way the energy would be dispersed before it got down to the horn." When it's put into its digital format, Dilg thinks it will sound remarkably clear and "that's strictly from wax onto a digital format without playing around with it, so it's still in its pure form as far as the engineering goes."

"Out of the recordings done at the

Edison Museum, TMBG was a more difficult band to record, but that's only because of the instruments they chose to use," Fabris adds. "Because of the way the equipment works, when we played the record back the tuba player was really loud, even though he was standing in the back."

As you might expect, recording with this equipment is very different from recording with microphones. Dilg explains, "Horn instruments record very, very well, but most string instruments don't pick up well. The drums are also difficult to record. The only way to turn an instrument down is to move farther away from the horn. After they did the first setup and recording, they had to reorganize themselves to move things forward that weren't loud enough and vice versa." Although today you set up the microphones around the musicians, with this equipment you have to move the musicians around the horns. "You don't want too many horns because then the sound starts to go in one and out the other," Fabris says. "For many recordings like this you would just use one horn. This way the music goes straight in there and it doesn't escape. The problem with using two horns is

the sound is a little bit weaker. The advantage is that it's easy to get everyone close because there's more space in front of two horns vs. one."

From the group's perspective, "The performance positions were not entirely comfortable," Flansburgh notes. "We had to sit close to the phonograph, sing right into it and at the top of our lungs. We can't really say whether using the Edison equipment was better or worse, but we are very pleased with the recordings."

They Might Be Giants don't plan on editing any of the material they recorded at the Edison site; it will be used as-is. And who knows—the ever-eccentric TMBG are definitely the kind of game types who would try this kind of stunt again. "The fact that the technology to record sounds existed that long ago was not only incredible to us, but the rapid development of recording to what it is today is phenomenal," Flansburgh says. "It became all the more apparent when recording with the Edison equipment that the innovations in the recording process have happened so quickly with such wonderful results. It makes you wonder where recording will be in another 100 years from now." ■



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TAPE & DISC NEWS



Integrated Network Solutions' RCDT 1020 CD-R duplicator

CD-R DUPLICATION MOMENTUM GROWS

As the use of recordable CDs grows in popularity, more systems are being devised to make duplication of the discs practical and cost-effective in quantities below the normal minimums for production at a replication plant. One example of how such capabilities can be used in the music industry is found at Hollywood's 52nd Street Digital Mastering Services. The company recently developed an in-house production capability based on proprietary CD-R writing software and hardware from Kodak, including the PCD 600 6x writer and the Disc Transporter, which features automatic load and unload functions and a 75-disc capacity. The company is offering record companies same-day turnaround on small-run CD orders.

Evidence of the overall increase in use of CD-Rs comes from the IFA, a recording media trade association,

which reports that unit shipments grew from 2.057 million in 1994 to 9.471 million in 1995, an increase of 360%. In response to the growth in demand for recordable blanks, Mitsui Toatsu Chemicals, one of the leading producers of CD-Rs in Japan, has announced plans for its U.S. subsidiary, MTC America (Purchase, N.Y.), to construct a CD-R plant in Colorado Springs, Colo. The plant will be operated by the newly formed company Mitsui Advanced Media Inc. MAMI says it plans to run the facility 24 hours a day once commercial production begins in early 1997.

MTC America has also announced the AOL-501C TransCorder, a CD-R disc transport system with a built-in 2x 4x CD recorder/reader.

The system works its way through a stack of up to 50 discs, reading finished master discs into memory and then recording onto subsequent blanks. This approach allows several master discs to be interspersed with blanks so that several different programs may be copied without operator intervention.

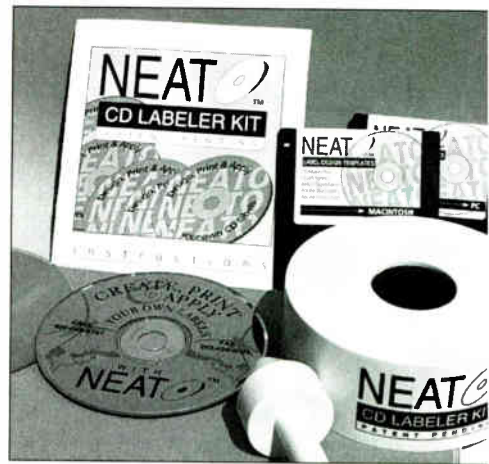
Meanwhile, Microboards (Chanhassen, Minn.) announced price reductions on its CD-R duplication gear, dropping the cost of its single-disc CD Blaster system to \$4,495. The company's networkable CD-Maker line is now priced at \$13,995 for a system that records four discs at once, and \$19,995 for an eight-disc system capable of duplicating up to 64 discs per hour. Another option in the field is Integrated Network Solutions, offering the RCDT 1020 CD computer-based system for Windows PCs. The compa-

ny claims that ten to 15 sources of any format may be copied onto ten to 15 CD-Rs in less than 32 minutes.

For those requiring integrated printing, Rimage (Minneapolis, Minn.) recently announced an enhanced version of its Perfect Image CD-R Automated Publishing System. The APS is a Windows-based system consisting of software, an in-line Rimage CD-R printer and the Kodak Disc Transporter with integrated CD-R recorder. Prices for the APS range from \$20,250 for a 2x system to \$32,550 for 6x recording. Those with lower budgets or less-sophisticated printing requirements might consider the Neato kit from MicroPatent of East Haven, Conn. The kit provides templates for creating custom labels in common PC and Macintosh graphics programs, as well as pre-cut, CD-shaped adhesive labels that can be printed on a laser printer and applied to a CD-R with the included labeling tool.

BASF SHIPS NEW C-100 TAPE

BASF Magnetics began shipping a new audio cassette duplicating tape, AT 11 Ferro Plus C-100. According to BASF, the new tape features significantly increased oxide packing densities, which allows a thinner coating of oxide to produce the same sound quality as a premium C-90 tape but with more than 100 minutes of playing time. The 11-micron tape is based on the layering technology and base film used in the company's AT 12



Neato kit from MicroPatent

BY PHILIP DE LANCIE

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SPICES

Northeastern Digital Recording (Southboro, MA) remastered three David Bowie albums for Rykodisc, two new Arlo Guthrie albums and the latest from Jay Geils and Magic Dick for Rounder Records...Mark Knopfler's latest, *Golden Heart*, was mastered at Georgetown Masters (Nashville) by Denny Purcell using the Model One HDCD Processor from Pacific Microsonics...At New York City's Digital Domain, engineer Bob Katz mastered *Love Notes From the Bass* for the Jazzleads label and the Westminster Choir's latest on Chesky Records...Also in New York, Engine.RDA completed an enhanced CD single for Atlantic act Hootie & the Blowfish...Engineer Ken Lee of San Francisco's Rocket Lab mastered blues albums from John Lee Hooker guitarist Michael Osborn and Mick Overman. Lee also worked on releases by the Bobs, Zydeco Flames and Assassin, a compilation featuring 2-Pac and other Bay Area rappers...Time Capsule Mastering (Long Beach, CA) announced the purchase of a Focusrite ISA-315 Blue Series mastering equalizer and a dB Technologies 3000S 96kHz Digital Optimizer and sample rate converter...Toronto-area mastering house Music Lane (Markham, Ontario) reports mastering releases by Domenic Trolano for EMI Music Canada and the Irish Descendants for Warner Music Canada...Alpha Records Mastering opened in Plantation, FL, with a Sonic Solutions-based system that includes components from Bryston, Z Systems, Mytek Digital, Sony and Tannoy. The company's services include digital editing, PMCDs, CD-Plus and NoNoise...Gauss (Sun Valley, CA) reports international sales to duplicators in China, United Arab Republic, Thailand and Indonesia, while sister company Electro Sound reports sales of its "budget" duplicating system, the Series 7500, to The Audio Source (Northbrook, IL), Aaztec Recording (Phoenix, AZ), and to duplicators in Palestine, Indonesia and India. Electro Sound also sold Series 9000 systems to several clients recently, including Disc Makers/Music

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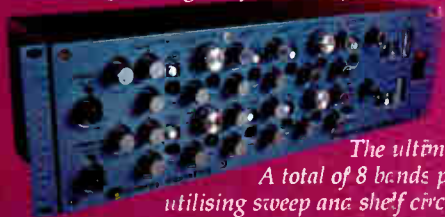
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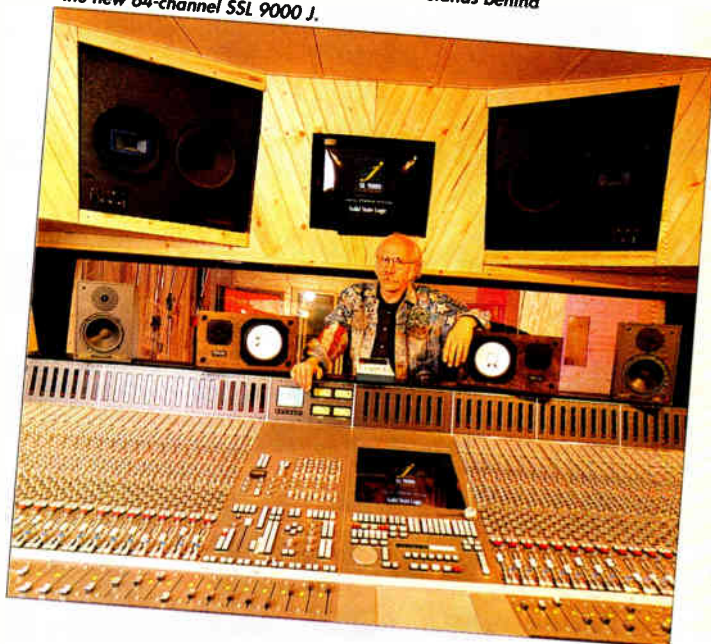
NEW YORK METRO

by Dan Daley

New York in a post-Power Station world. It was quiet, disarmingly so. The usual stream of faxes and e-mail from New York studios continued coming in. It was as though nothing had changed. New York, the city with no cemetery space left, buries its corporate dead quickly and moves on. As of late May, **Power Station**—which *will be renamed* after new owners Takashi Kanamori and a group of Japanese investors close the deal on the studio, scheduled for just after Memorial Day—remained under 24-hour guard, according to the publicist for auctioneer Rabin Brothers. Meanwhile, sightings of former owner Tony Bongiovi were rivaling those of Elvis—on the same day in late May he was reported to be in Southern District Court in Manhattan (filing motions to void the sale and prevent Power Station's new owners from using the studio's client lists to generate business), and simultaneously in Tokyo setting up capital funding for potential new studios, consulting on studio design for new studios in Japan and Bali, Indonesia and Northern Ireland, and preparing financing and other plans for a string of Power Station Cafes. The cafes were planned before the forced sale of the studio, and Bongiovi retains rights to the name Power Station.

—CONTINUED ON PAGE 206

In the recently remodeled Studio A at New York City's Quad Recording, facility owner Lou Gonzales stands behind the new 64-channel SSL 9000 J.



The main tracking room at the new facilities of Saban Entertainment, Los Angeles, designed by Studio 440

L.A. GRAPEVINE

by Maureen Droney

This month we check in with three Southland studio designers: 1994 TEC Award winner **studio bau:ton**, the year-and-a-half-old **Studio 440** and 1996 TEC nominee **Chris Pelonis**.

After opening in 1990, studio bau:ton quickly jumped to the forefront of studio design companies. Partners Peter Grueneisen, Peter Maurer and George Newburn built rooms with a simple, clean-lined look individualized for each space, and almost immediately they found themselves involved in prestigious projects. In 1995, Newburn left bau:ton and opened Studio 440, and the industry wondered how things would go. This month we visited with both to find out.

studio bau:ton's projects have covered a wide geographic area, from Bad Animals in Seattle to Studio Mega in Paris. X-Art and Peter Wolf's Embassy Studios in Austria and VTU Bach in Vietnam; in Southern Cal-

ifornia, their work has encompassed major music recording studios, post-production houses and project studios, including the expansion and renovation of Record Plant, work at Signet Sound, Post Logic Video, Ice T's project studio in Hollywood, and Bill Bottrell's Toad Hall in Pasadena.

Grueneisen and Maurer, both Swiss, originally met while attending architecture school in Switzerland and later joined forces in Los Angeles. Maurer, en route to Bangkok for a project consultation as we were going to press, has a degree in architectural engineering and is an alumnus of acoustic designer Vincent Van Haaff's Waterland Group. When he and Grueneisen hooked up, Grueneisen tells us, in his quiet and self-deprecating way, "I was just a boring little architect, doing a lot of different commercial and residential projects." Grueneisen, however, also has an architectural engineering degree, has a master's degree from the Southern California Institute of Architecture and an architects' license from five states, including California.

Almost immediately upon startup, bau:ton was involved in two projects: sound designer Craig Harris' home studio in the Hollywood Hills and L.A. Reid's studio in Atlanta. About the latter, Grueneisen comments, "It was not a very large project, but it was definitely prestigious. Also, quickly after that we did Bad Animals, and then Record Plant L.A.'s renovation—all the overall architecture, the central atrium design for the lounge, and the big tracking and mix rooms."

bau:ton gets involved on different levels for each proj-

West Los Angeles studio King Sound and Pictures reopened in March with a vintage API restored by Jerry Steckling, who is also responsible for the room's acoustic design and custom TAD monitors. Owned and outfitted by producer/engineer Jimmy Sloan, the facility includes a Studer A827 24-track.



Mix 3 at Interlock Audio Post, Hollywood, designed by Chris Pelonis of Pelonis Sound and Acoustics and featuring a Quad Eight console

ect, depending on what is required. "We are very flexible," says Grueneisen. "That may be our most significant trait—that there isn't any! We are very flexible for what anyone needs. We do everything from consulting to creating a turnkey facility—it just depends on what someone wants.

"There are some rules that we follow that are pretty universal," he states. "A lot of it is pretty pragmatic science. And then a lot of it is experience—we've done about 100 studios by now. There's always uncertainty in it, but in general we have the experience to know that what we do will be okay, to say the least. And, of course, there are calculations that we do and certain things that we can check on the drawings and on the computer to make sure it will work."

But what about rooms that are problematic? How does a design team cope when called in to try to fix an incorrect room? "Always, of course," Grueneisen answers, "should come first the physical environment. The tuning, well, that is fine, but you cannot solve the big problems that are inherent in a room with just tuning. That

Murielle Hamilton's personal studio in Los Angeles was designed by studio bau:ton and includes a Mackie 32x8 console.



PHOTO: MICHAEL SCHENFELD

just shifts the problems around. So typically our projects involve construction—if someone thinks they can fix their room without it, usually we are not brought in. When it needs construction is usually the point when somebody will give us a call.”

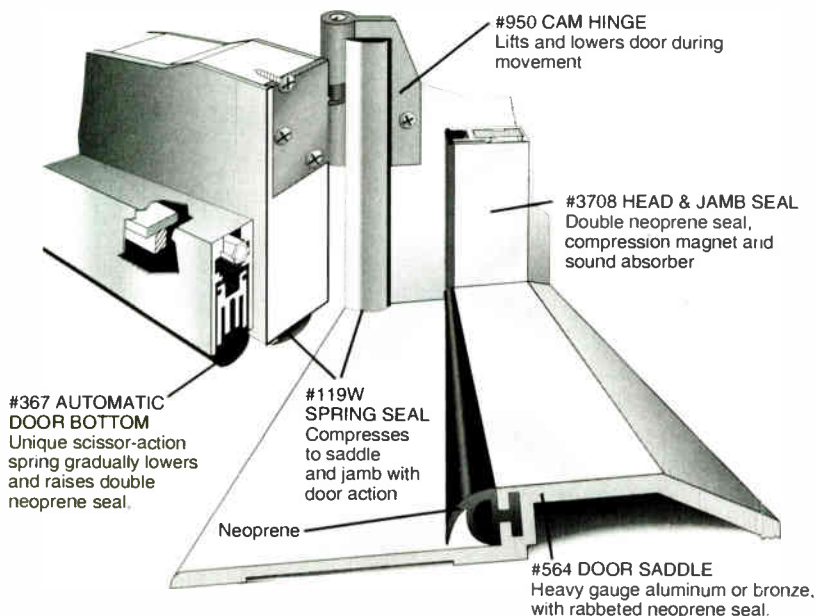
But bau:ton's work doesn't always involve major construction. “Sometimes we can work with what's there,” he says, “and do just a minimal treatment. EFX is a post-production house in the Valley, where what we did is an example of going in and working with what already exists. For another example, at Ground Control in Burbank, we simply put in a new front wall.”

What's in the works for bau:ton? They're designing a scoring stage control room on the Fox movie lot, a 10,000-square-foot post-production facility for Glendale sound design company Creative Cafe, and, in Houston, a ground-up facility called Rap-A-Lot Studios, comprising large tracking and mix rooms, a mastering suite and two MIDI studios. Just completed is a 20,000-square-foot facility in a Chicago high-rise for video production company Swell; work is in progress for Kiva Oceanway, Allen Sides' Nashville studio; the much-anticipated Hollywood studio now under construction for Kenny “Babyface” Edmonds; and, in keeping with the project studio explosion, a lot of home studios. “So many I don't know where to start,” laughs Grueneisen, who then lists off projects for Perry Farrell, David Lynch, James Newton Howard and Teddy Riley.

In November 1994, **George Newburn started Studio 440 with Ross Brennan and Jim McClintock.** The name 440 refers to A440—the center of tone on the piano, and the basis of the Western musical scale. It's also general enough, according to Newburn, to be used for architectural purposes “because we are architects first, but with a specialization in architectural acoustics and studio design.”

Newburn, who also studied and currently teaches a seminar in architectural acoustics at the Southern California Institute of Architecture, formerly worked with Vincent Van Haaff at Waterland. As he tells us, “About 1984 I met Vincent Van Haaff, at about the time he needed to hire somebody. We worked together until the end of 1989, which is when I left there and joined Peter Maurer and Peter Grueneisen at studio bau:ton.”

The other partners in 440 had their own company designing both retail and residential architecture. Before that, Mc-



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In *Control A* at New York's Kampo Studios (L to R) poet Allen Ginsberg, guitarist Marc Ribot, engineer Scott Ansell, facility manager Alex Abrash and producer Lenny Kaye recorded Ginsberg and Kaye's anti-materialist lament "The Ballad of the Skeletons" for Mercury's new spoken-word label, Mouth Almighty.

Clintock owned his own company, while Brennan, who also worked for bauton, had worked internationally in Finland, Paris and on the floating Kansai

International Airport in Osaka, Japan. Both have a master's in Architecture from UCLA. Some of 440's first projects were to continue with L.A.'s Royaltone Studios

and a remodel of the sound department of Estudios Churubuscos in Mexico City, under the auspices of bauton. Since that transitional phase, 440 has completed a studio in downtown Santa Monica for Earth Wind & Fire's Maurice White, called Magnet Vision, and a large installation for Saban Entertainment. Saban, which experienced phenomenal growth with "Power Rangers" cartoons and the resulting merchandising, took over five floors in a highrise in Westwood and hired 440 to design the audio production floor.

"It was a large and problematic project," says Newburn. "The second floor, about 14,000 square feet, was the designated production floor because it had 20-foot-high ceilings. But it was also the mechanical floor, which posed its own set of problems—it had the equipment for the first 12 floors of a 24-story building, like the air conditioning units, heat pumps, etc., all of which generated a lot of noise and a lot of vibration. It was complicated, but it ended up being a very successful project. It's probably the largest complex like this built in some time in L.A., with a THX mixing stage, a music recording room, dialog recording, a composers' suite and ten edit bays. It was a huge project, and we didn't have much time to finish it. We were hired about May 1, and they started construction September 1—the entire project was completed in nine months."

Everyone at 440 is currently excited about their work with the computer games company 7th Level Inc., which has built a new facility in Glendale to do graphics and audio production. Collaborating with founders Bob Ezrin and Scott Page, 440 turned a 3,000-square-foot area into a music recording studio, MIDI composing room with attached overdub booth, and six edit bays.

Newburn took time out to give this writer, fairly ignorant of the studio design process, a synopsis of what his company does. "We try to focus on providing a thorough service to a client," he says. "That ranges all the way through the typical services that are provided by an architect: the consultation regarding site selection; creating a budget with the owner; working with them to maintain that budget; creating a thorough set of construction documents and specifications for a project so that when a client starts construction, they can start confident that there aren't going to be any hidden costs, and that everything is clear, well-defined and specified."

"Usually the owner hires the contractors and we do what's called con-



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New facility Corner Canyon Studios (Draper, Utah) features an Allen & Heath GS3V-32 console, 24-tracks of DA-88 and Tannoy Gold mains.

struction observation or contract administration," he adds. "The architect normally doesn't really supervise the construction. Usually the plans and specs are sent out for competitive bidding, and when the plans come back,

we sit with the owner and make a decision on who is the most qualified of the contractors to do the project based on experience and price, etc. And then the contractor and owner will sign a contract, which of course we'll review and advise the owner on, and then we're there to observe the construction as it progresses and to make sure it's in conformance with the plans and specifications. Then at the end of the project, we'll walk through with the owner and create a punch list, as it's called, which is an itemization of all of the things that a contractor needs to complete or redo in order for final payment to proceed."

Upcoming for 440? A demo studio on L.A.'s West Side for MCA Music; in Portland, Oregon, a surround sound theater for film director Gus Van Sant—"He bought an old turn-of-the-century nickelodeon theater, which we are remodeling and bringing up to THX specs. There will be a dubbing stage/screening room. He also wants it to be able to function as a performance venue for live music because it has a stage and a small fly space, so we are working that into the design." In Taiwan, a post-production studio for film

—CONTINUED ON PAGE 207

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SESSIONS & STUDIO NEWS

SOUTHERN CALIFORNIA

Geffen artists Cowboy Junkies mixed their single "Speaking Confidentially" at Image Recording in Hollywood with mixer Chris Lord-Alge and producer John Keane...At Red Zone Studios, Tommy Eyre produced material for his band Animal Legends with recording and mix engineer Ric Bowles...Jane Weidlen of Go Go's fame mixed the Geffen debut of her new band Frosted at Scream Studios (Studio City) with producer Marc Waterman and mix engineer

Douglas Trantow...Producer/engineer Carmen Rizzo tracked RCA artist Junkster in Studio B at L.A.'s Skip Saylor Recording. Rod Michaels assisted...Wayna Morris of Boyz II Men mixed four songs for an upcoming project with engineer Rob Chiarelli in Cherokee Studios (Hollywood)...

NORTHEAST

Zero Hour recording artists Varnaline recently finished up their second record with producer/engineer Adam Lasus at his Studio Red in Philadelphia...Irish living-legends The Chieftains returned to New York City's Clinton Recording for recording, editing and mixing of their

new RCA release. Bandleader Paddy Maloney produced, and Jeffrey Lesser engineered, assisted by Adam Blackburn; staff engineer Troy Halderson helped out with editing and sequencing...Kathy Mattea mixed an upcoming Mercury Records release at BearTracks Studio in Suffern, NY, with producer/engineer Ben Wisch and assistant Steve Regina...Pranksters the Jerky Boys are on the phone again, making their third album (and Mercury debut) with Paul Goodrich at Merlin Studios in New York City...Tori Amos mixed some live material for the B-side of an upcoming single at Boston's Sound Techniques. Mark Hawley and Marcel Van Limber engineered for Atlantic Records with assistants Dave Kirkpatrick and Andy Martin. Also, the studio hired Ted Paduck as staff producer/engineer...The latest release from leading Swiss act Zuri West was completed at Philadelphia's Tongue & Groove Studio by producer Dave "Stiff" Johnson and engineer Mike Klein...New York City's D&D Recording hosted sessions for an array of hip hop and R&B artists, including DJ Premier, Onyx and Bahamadia...Producer/engineer John Agnello mixed the new Atlantic release for Jawbox at The Magic Shop (New York City) with assistant Juan Garcia...Albany's Cotton Hill Studios recently hosted mix sessions for the new Hair of the Dog release on October Eve Records, produced by band member Rick Bedrosian...Producer Dave Fridmann was at Sweetfish Recording (Argyle, NY) recording Warner/Reprise act Lotus Crown and Elektra's Jennyanykind...

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NORTHWEST

Patti Austin tracked and mixed her new album for Pony Canyon Records at Homesite 13, the private studio of her producer, Louis Biancaniello...Multi-Platinum types Live recorded basic tracks for a new release at San Francisco's Coast Recorders with producer/engineer Jay Healy; Mike Johnson assisted...At Toast, a San Francisco facility, Skold were in remixing a single from their RCA debut with producer Philip Steir and engineer Chris Haynes. G Love & Special Sauce were also in, mixing songs with producer Jim Prescott and engineer Jacques King...

SOUTHEAST

Mem Shannon was in New Orleans studio The Boiler Room recording his second record for Hannibal/Ryko with producer/engineer Mark Bingham...Soul great Curtis Mayfield worked on a new album at Atlanta's Doppler Studios. Lead



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vocal recording and mixing tracks were produced by Narada Michael Walden and Daryl Simmons of Silent Partner, with engineers Thom "TK" Kidd, Dave Frasier and Carlos Glover and assistant Alex Lowe...Recent activity at Fort Lauderdale, FL, facility New River Studios included Latino star Juan Gabriel self-producing his next release, as well as producing a project that includes singers Lola Beltran, Lucha Villa and Amalia Mendoza. Engineering and co-production duties were handled by Vavy Lozano, assisted by Brad Kinney and Riley J. Connell...Tanya Tucker tracked for Capitol in Nashville's Masterfonics with producer Greg Brown and engineer Rob Feaster...At Miami's Criteria Recording, Mexican singer Graciela Bertrand completed mixes for an upcoming LP on Capitol Mexico. Producer/arranger Bebu Selveti oversaw the dates, which were engineered by Carlos Nieto and assistant Chris Carroll...Local stomp metal combo Obey Bizar recorded and mixed their latest effort with producer/engineer Tracey Schroeder in Studio A at Reflection Sound Studios in Charlotte, NC...

SOUTHWEST

Atlantic artists DFC remixed a single at Planet Dallas (Dallas) with engineer Rick Rooney...Omar & the Howlers recently wailed at Austin's Arlyn Studios with producer/engineer Richard Mullins, while over at sister studio Pedernales, Billy Joe Shaver was in with producer Randall Jamail and engineer Larry Greenhill...At Keith Harter Music in San Antonio, the Dead Crickets overdubbed and mixed material for their new CD with engineers Keith Harter, Marius Perron and Steve Cureton...

STUDIO NEWS

Producer/composer Daryl Simmons of Silent Partner Productions recently opened his own studio in Atlanta, named Silent Sound. Designed by the Russ Berger Design Group, the facility is equipped with an SSL 4064 G with Ultimotion, Northwest TAD monitors and two Studer 827 24-tracks. Technical installation was provided by Comprehensive Technical Group...Austin, TX, recording Mecca Hitshack Studios installed 38 channels of Uptown 990 automation on its Neve 8058, while Kokopelli Sound Studio of Miami added 39 channels of Uptown to its refurbished Class A discrete Neve 8068...Full Sail Real World Education in Winter Park, FL, became the first school

to purchase an SSL 9000 J Series console. The board will be installed in the school's Studio B in September, after the room has been refurbished by designer John Storyk. ■

—FROM PAGE 196, NEW YORK METRO

Former studio manager Zoe Thrall has been named president of the as-yet-unnamed facility. She, like a number of Power Station staffers, has remained. She said the studio was not taking bookings until after the closing and a tentatively scheduled reopening on July 15, and that Power Station had to cancel the equivalent of nearly two months of bookings, with some of them redistributed to other Manhattan studios. She confirmed the 24-hour guard on the studio, which she said would remain in effect at the expense of lienholder Chemical Bank until the financial closing, which was scheduled for sometime in early June.

Still, Thrall said, she and new owner Kanamori were extremely optimistic about the future of the facility, with a new Pro Tools suite and a new MIDI/composing suite planned for construction this year. "Mr. Kanamori sees the potential in this studio," she said. "It has a wonderful history, and once we put a lot of what's gone down in the last month behind us, there's a lot of potential here and in New York." While the studio does not have a new name, it does have a new phone number: 212/664-1144.

Other news—**Bradshaw Leigh** has been named chief maintenance technician at **Sound On Sound Recording**. Leigh will also keep working as an independent recording engineer; current project is John Ondrasik for EMI Records...**Anthony M. Giovanniello** was named operations manager at Howard Schwartz Recording. Giovanniello originally joined HSR in 1981, and after stints with other production companies, returned there in 1995.

Arnie Rosen, a well-known and long-standing engineer and studio owner in Manhattan, passed away on May 31. He was 60 years old. At the time of his death, Rosen was working as a sound designer and engineer for Howard Schwartz Recording. Rosen was perhaps best known, however, as the founder and owner of Audio One, a studio he opened in the early 1970s and ran for the next seven years. He joined HSR in 1979 and worked there for five years, helping Schwartz build that business. After stints elsewhere, including Su-

perdupe, he returned to HSR in 1995.

Rosen is survived by a wife and two sons—Steve, who is also a mixer at HSR, and Eric, a colorist who recently left New York for Seattle. Contributions in Rosen's name should be made to either Sloan Kettering Memorial Hospital or the New York Philharmonic. ■

Fax your New York news to Daley at 615/646-0102 or e-mail danurwriter@aol.com.

—FROM PAGE 202, L.A. GRAPEVINE

and video audio, and in Mexico, a package for the acoustics, architecture and interior finishes for the screening room of a major film school.

1996 TEC Award nominee Chris Pelonis is a different breed of studio designer. As he puts it, "I definitely have approached studio design from a user's standpoint. I started out being a recording artist; I went from that to engineer/producer. Then, when I built my own studio, I found a lot of dead ends on people helping me with the acoustics. It's very frustrating to work really hard in a studio and to listen in your car or at home and find you've got something entirely different than you thought. And that was always a pet peeve of mine. I burned a lot of money in studios that were inaccurate, and I became obsessed with pure musical sound."

Pelonis, who has offices in Santa Barbara, Huntington Beach and Downey, has credits that include, among others, several rooms for Disney, both in Burbank and Orlando, mastering rooms for Geffen Records and Futuredisc, and the new Mad Dog Studios in Burbank.

About his philosophy, he explains, "There's the real analytical laboratory-type of environment that isn't inspiring, and then there's the overly colored sound that doesn't tell the truth. I've married the two, because I come from an artistic background. I don't really go for the super lab sound because I want it accurate but still inspiring.

"When I started, the biggest problem I was having was the low frequency, which everyone encounters, so I started shopping around and trying the different bass traps on the market. None of them did anything for me. So I designed my own, which led to inventing and patenting The Edge bass trap ten years ago. I really built it for myself, but all of my peers were engineers and producers and home studio owners—they started hitting me up to build them these traps,

and next thing I knew I sold thousands. That led to, 'Well, now that I've got the bass handled, can you help me with some diffusion?' And, 'What kind of monitors are you using and where do you place them?'

"I grew up in the recording business," Pelonis continues, "and a lot of this was really second nature to me. But I sort of stumbled into designing because I had the answers that were working for people. Now I'm doing full ground-up drawings and CAD designs, and I've developed a whole line of modular devices, including completely modular studios where we prefabricate the walls.

Recent projects? "For Futuredisc, I redesigned the original rooms 1 and 2 and then built their latest room from the ground up. Mastering rooms to me are easy, because it's just sound. They're not that worried about, 'Hey, I've got to have a TV and a couch over here, and what about the guy who wants to hang out with his girlfriend?'—there's none of that. I can be totally symmetrical—place things where I want, place the door where I want, and the monitoring system is designed not for hype but for musical accuracy.

"I did some redesign on Randy Albert's *Scream Studios* when we put the main monitors in—great records come out of there, and Randy is constantly upgrading. They're so booked, though, it's hard to get in to do the few little things we want to change! For the post house *Interlock*, I designed their film dubbing stage and their Foley pit. I also designed a waveless water pit for them."

Other projects include a multimedia facility for Davidson and Associates, a home studio for Christopher Cross, a room for songwriter Ben Margulies, John Tesh's home studio, and, of course, Mad Dog Studios. "We've done in the hundreds of rooms," Pelonis says, "but I don't really keep track—I don't have a portfolio. I just went after the jobs to do the best work that I could to make people happy with their studios. I'm not a glitzy guy—I go to work in shorts, T-shirts and thongs, and I don't keep trophies on my wall. But it's nice to be recognized, and I'm grateful to be noticed, because I'm not really that good with promotion. My idea of PR is to invite you to come to Santa Barbara where I'll take you down to the Press Room for a Guinness!" ■

Maureen Dronney is Mix's L.A. editor. She can be reached by fax at 818/346-3062.

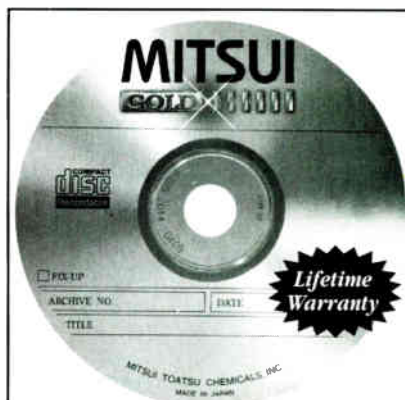
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—FROM PAGE 38, *ACOUSTICALLY CHALLENGED*—
 appeal. Available in standard and custom sizes up to 4x10-feet, AlphaSorb panels come in 1- and 2-inch thicknesses. They are wall- or ceiling-mountable and are available in a variety of fabric covers. AlphaSorb panels are Class 1-rated and have NRCs of .80 and 1.05.

NetWell manufactures Fiberglass-

core, fabric-covered panels in 1- or 2-inch thicknesses that are custom cut in width, length and geometric shape for specific applications, up to 4x10 feet. These wall-mounted panels are available in 30 fabric colors and are Class A-rated. NRCs are .80 for 1-inch panels and 1.05 for 2-inch panels. Also offered are Silex panels, which combine NetWell's Silence wallcovering material and FireFlex foam panels, and C-STC Wall panels, which combine fabric panels with dB BLOC acoustical barrier materials.

RPG Diffusor Systems offers AcousticTools, a line of affordable products geared toward project studios. The Abflector is an upholstered, "Vari-

able-Depth-Air-Cavity" panel absorber that absorbs and deflects sound away from the mix position. The panel provides broad-bandwidth reflection control and extends low-frequency response beyond that of a flat absorbing panel. Also from RPG, the BASS Trap is a membrane absorber designed to control low-frequency modal problems often found in project studios. BASS Traps offer high efficiency at 80 Hz, where the axial modes of small rooms are located.

The SP-1 and SP-2 from **Studio Pro** (Huntington Beach, Calif.) are quarter-round wall panels, wrapped in diffusive fabric. The SP-1 offers absorption above 125 Hz and diffusion above 500 Hz; the SP-2 is absorptive down to 50 Hz and diffusive above 500 Hz.

Systems Development Group offers Sonora Panels, built from Fiberglass, with hardened edges. Custom thickness, panel size and fabric coverings are available; panel edges can be beveled, mitered or rounded at no charge.

BAFFLES

Baffles are the most flexible of acoustical treatments. They usually provide a combination of absorption and diffusion and can be set up in a variety of configurations to solve acoustical problems, as well as to temporarily modify control room acoustics and create mini-environments. Baffles can minimize reverberation, serve as free-standing iso booths, work in corners as bass traps or be arranged as walls to eliminate leakage between instruments, to name a few uses.

AlphaFlex™ Class 1-rated ceiling banners from **Alpha Audio** are designed to reduce excess reverberation in large-volume areas, and attach to ceiling or structural beams with grommets or rigid fasteners. Banners have a PVC exterior and are available in 4-foot widths, 2- and 4-inch thicknesses, and custom lengths up to 400 feet. Available in white, black or gray; NRCs range from 1.00 to 1.15.

New from **Accusonics** (German-town, Md.) is the Clear-Sonic line of transparent acoustic isolation panels for stage and studio use. Standard 8-foot systems are available in 4-, 5- and 6-foot heights, and options include transparent hinges, nonslip steel-reinforced base channels, cable cutouts and edge protectors. Also available are heavy-duty covers and acoustic foam attachments.

Acoustic Sciences Corp. (Eugene, Ore.) is mostly known for its extensive

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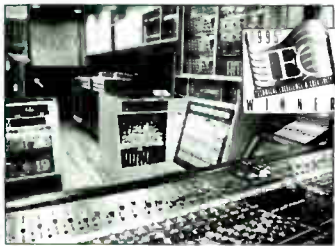
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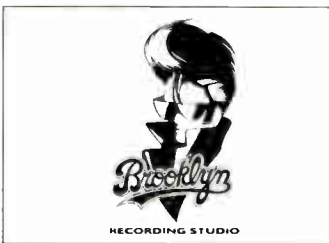
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line of Tube Traps™, stand-alone tube-shaped gobos that provide a combination of diffusion and absorption. New from ASC is the Studio Trap system, which consists of a set of 9-inch Tube Traps, in which half of each surface is covered with an acoustically reflective membrane. This diffuser works in combination with broadband-absorptive material to control room frequency response. Different Modular Acoustic SubSpace (MASS) configurations of gobos provide solutions in a variety of situations: A wall of Studio Traps, for example, provides an absorptive impedance barrier for soffit-mounted mains, while a Quick Sound Field (QSF™) horseshoe pattern creates a semi-isolated acoustic subspace, ideal for miking.

The Cloaking Device acoustic conditioning system from **Folded Space Technologies** (Acworth, Ga.) is designed with the home and project studio in mind. The building block of the Cloaking Device system is a 2x4-foot panel, with one side treated with 2-inch acoustical foam and the other with ¼ inch hardwood ply. These panels can be flipped, grouped, wall-mounted and stand-mounted or linked or stacked to form wall coverings, barriers and enclosures. Included with a basic system are four panels and two adjustable swivel stands. Options include single panels, stacking straps, stilts, linking hardware, wall standoffs and foam slices.

SONEX baffles from **illbruck** are designed to hang from ceilings in large rooms. They feature integrated nylon webbing straps for easy hanging, and are available in four SONEX patterns with a variety of finishes.

NetWell offers 24x48-inch baffles that are convoluted on both sides for maximum absorption. Baffles are constructed of polyurethane foam lined with a wire structure to improve strength when hanging or connecting units.

PilloBaffles® from **RPG** are baffles designed to provide broadband absorption when suspended from ceilings or spaced from walls. PilloBaffles are fabric-covered and available in seven colors; logos can be silk-screened for an additional charge.

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Silent Source's Noisemaster baffles are 24x48-inch baffles consisting of a Fiberglas core with a polyethylene cover; edge grommets facilitate hanging. A sailcloth-covered version comes in 13 colors. Both versions are ASTM E 84-rated and have an NRC of 10.5.

The SP-9 from **Studio Pro** is an all-purpose rectangular gobo measuring 51x24x8 inches. An optional cymbal shield assists in drum isolation, and color choices include a white frame with black, gray or white grille cloth. The SP-16 is a "tube"-type, free-standing bass absorber. Color choices include black, white and gray, and rubber dampening strips transform the SP-16 into a monitor stand. The SP-17 is a bass absorber designed to be mounted in corners and is available in black, white or gray. Both traps are said to provide absorption to 35 Hz.

Available next month is **Taytrix's** (Jersey City, N.J.) Stackit™ system, a line of stackable gobos that can be assembled in different configurations to meet various production needs. Panels can be used as wall coverings, baffles, room dividers or connected together to form enclosures. Stackit gobos are 8-inch-thick panels constructed with a combination of absorptive and reflective materials (custom acoustic treatment is available), or assembled from clear Plexiglas® panels. Various sizes are available, from 16x24-inch to 4x8-foot. Panels have rounded edges with hook-and-loop closures to allow setup at any angle. The entire system is modular, allowing for expansion.

BARRIERS

Ordinary home (or business) walls alone are not enough to completely isolate noise—just ask your mother. Adding layers of dense, limp mass to wall structures is an effective way to help soundproof your studio. If you can't retrofit your walls (not a good idea for renters), some of the products listed below can also be hung on wall surfaces.

AudioSeal™ from **Alpha Audio** blocks the transmission of sound through walls, floors and ceilings. The barrier consists of a lead-free, 1-pound/square-foot vinyl sheet, available in either a reinforced or

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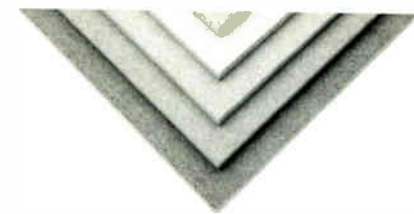


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nonreinforced version. It's available in 54-inch-by-60-foot rolls, or by the linear foot. A Class 1 fire-rated version is available; STC is 27.

SheetBlok™ from **Auralex** is a sound barrier formed from 1-pound/square-foot vinyl sheeting. SheetBlok is a non-reinforced material designed to be layered with wall and floor materials; the STC is 27.

NetWell offers dB BLOC, a 1-pound/square-foot PVC vinyl barrier; NetMat, a ½-inch urethane foam bonded to a vinyl barrier layer and then a vinyl film; and Noise Barrier, a composite material combining the effects of dB BLOC, a ½-inch backing foam and a 1-inch front-facing foam (an optional pressure-sensitive backing is available).

Sound Barriers from **Silent Source** are sheets of 1-pound/square-foot vinyl sheets, available in a nonreinforced version for horizontal layout or reinforced with Fiberglas mesh for vertical hanging. STC is 26.

CEILING TILES

Your studio ceiling is an ideal surface to treat because it has the largest available area. In addition, the ceiling can be made absorbent without completely deadening a room. Acoustic ceiling tiles are easy to install—most just drop into standard ceiling tile grids.

AlphaTec™ ceiling tiles from **Alpha Audio** are Class 1-rated absorptive tiles designed to drop into standard ceiling

grids. Constructed of melamine foam with fiberboard backing, the tiles have NRC ratings of .75 to 1.00 and an STC of 21. Four patterns and a smooth tile surface are available, in white, tan or gray.

Netwell offers ceiling tiles in 2-inch-thick, 2x2-foot squares to drop into ceiling grids. Four patterns and a flat-faced version are available; tiles have an NRC of .90 and come in natural white with optional painting available.

Acoustic ceiling tiles from **Silent Source** are compatible with square suspended ceiling tiles. Standard colors are white, gray and charcoal black; five tile patterns are available. Painted or Hypalon-coated tiles are optional.

DIFFUSION DEVICES

Diffusion devices scatter sound reflections by breaking up large, flat surfaces into areas of varying size, depth and angle. Used properly, diffusion can widen a sweet spot, increase clarity by delaying early reflections reaching the listener, and reduce standing waves and flutter echoes without diminishing acoustic energy.

T™Fusors™ from **Auralex** are 23.75-inch-square panels that can drop into a suspended ceiling grid or wall-mount to flat surfaces. Made of thermoplastic, paintable resin (a transparent version will be available soon), T™Fusors vary reflective surfaces by introducing different surface shapes in a "T"-type pattern. A modified version, the MiniFusor is 12x12x5 inches, geared toward project studios.

RPG Diffusor Systems' new AcousticTools line, which is geared toward project studios, features Skyline™: an omnidirectional, two-dimensional, primitive-root sound diffusor. Each

DON'T FORGET THE DOOR . . .

More often than not, studios are in noisy areas. Common isolation goals include not only preventing sound from escaping your studio but also keeping unwanted outside noise from seeping in. And the studio area most often overlooked is one of the primary sources of the problem—the door.

The weakest link in most studio doors usually lies not in the door itself, but rather the space around it. **Zero International** (Bronx, N.Y.) offers a variety of products to solve leakage problems and provide an alternative to double doors. Zero systems, integrated into your door structure, create a seal around the edges to eliminate any spaces and improve isolation. Models range from a neoprene compression seal/adjustable gasket combination, to double-automatic-seal door bottoms with magnetic gaskets. ■

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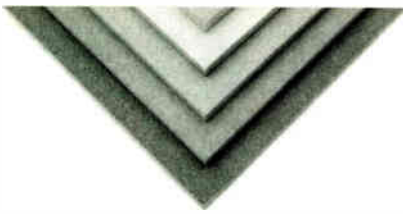
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word radio history



module is 2 feet by 2 feet by 6 inches. Standard finish is a white Class A-rated paint.

Studio Pro's SP-72 is a diffusion panel that uses Triangular Geometrical Diffusion to provide uniform diffusion over five-octave bands. The panels are available in white and measure 4x2 feet.

The Art Diffusor from **Systems Development Group** is a modular system designed to combine acoustic treatment with aesthetic appeal. The system provides two-dimensional diffusion through varied-surface, tile-like panels. The Model C Art Diffusor provides diffusion over a four-octave bandwidth, is made of Class A-rated, molded thermoplastic resin and replaces 2x2-foot ceiling tile. Model DL is similar but has a cutout to accommodate a light fixture. A wall version, Model WM, is also available. The Model E Art Diffusor, a 15-inch-square panel, offers diffusion over a five-octave bandwidth and is formed from EPS plastic. The Model A diffusor is handmade from unfinished hardwood and offers greater than five-octave diffusion. The 15-inch squares are available in a variety of wood types.

WALL COVERING

Fabric wall covering is ideal for absorbing excessive highs while maintaining aesthetic appeal. A bonus with fabric wall covering is that it is unobtrusive and is available in a huge variety of textures and colors to match any studio. Fabric wall covering is generally more affordable than some other types of treatment. Watch out for boominess caused by disproportionate absorption ratio of high end to lows.

Soundtex™ acoustical wall covering from **Alpha Audio** is made from Class 1-rated polyester, available by the bolt or yard and sold in 18 colors. SoundTex installs with wallpaper adhesive for a seamless finish. NRC is .65.

Netwell offers Silence, a ribbed-surface, woven-polyester fabric wall covering with an NRC of .65. Silence is sold by the yard or bolt and is Class A-rated, mildew- and mold-resistant and available in 24 colors. ■

Sarah Jones is a Mix assistant editor.

—FROM PAGE 138, COMB FILTERS

lution might be and whether the curve is equalizable.

MEASUREMENT

Measuring the frequency response of a system will show a complex series of peaks and dips. Before equalization is applied, it is helpful to identify the sources of interactions that caused the peaks and dips. This puts us in a better position to take the most effective steps toward system optimization.

When an offset between two sources is known, the chart on page 138 can be used to predict how the frequency response will be affected. The frequency multiplier, or comb frequency (CF), and the frequency of the first null can be found to the right of the time offset. Once the comb frequency is determined (i.e., the first peak), succeeding peaks will be spaced above it by an octave, ½-octave, ⅓-octave and so on. The dips will be halfway between each peak.

Although an accurate calculation of the time offset between two identical signals will predict the comb frequency and related frequency-response dips, the actual amount of attenuation that results will depend on the two signals' relative amplitude responses. The off-axis frequency responses of speakers and microphones typically show an HF roll-off; a reflective architectural feature that produces a delayed signal (such as a floor or wall) will tend to absorb HF energy. The combination of a direct signal with a delayed signal that exhibits HF roll-off will result in deeper comb filtering in the LF than the HF region. The depth of the comb filtering reduces as frequency rises (see Figs. 2 and 3).

In order to minimize comb filter cancellations, follow these two basic guidelines:

- 1) Keep time offsets to a minimum. This pushes the frequency of the first null up higher in frequency. Higher is better since this means less of the audible spectrum has cancellations.

- 2) Design the system so that level offset rises as time offset rises. This keeps the size of the ripple down. If we can achieve reasonable isolation at frequencies above the first null, the range below it is very usable power addition.

These principals are fundamental to the concept of point-source speaker arrays—let the low end couple, but keep the high end separate. ■

Bob McCarthy is director of SIM engineering at Meyer Sound Laboratories, Berkeley, Calif.

THE FAST LANE

—FROM PAGE 20, SOMETHING IS MISSING HEAR
cree such things that when you record a tone on analog tape, a noise pattern is generated around that tone. In other words, if you lay down a 1kHz tone and then examine the playback with a spectrum analyzer, you will see the vertical line of 1 k, and noise energy that starts somewhere below 1 k and climbs to a peak at 1 k, and then descends, like an inverted ice cream cone: wide at the bottom and narrow at the high (1k) amplitude peak. Then there are some more of these noise energies, shaped the same, at other frequencies, sort of "ghosts" or "harmonics." Now *please* don't write me to say that this explanation is simplistic or inaccurate—I am just attempting to provide a fast conceptual model of this phenomenon.

These bands are related to what is being recorded, so complex signals produce complex noise artifacts. These are of interest because they are heavily masked by the original signals, but they are there, happily modulating with the music and happily adding a dynamic pattern of tracking "noise harmonics."

Granted, these things are relatively minor considerations (and they are only a few of about 20 functions that we here at the St. Croix What Went Wrong Research Laboratories suspect may contribute), but when combined, they may help define the missing link. They may be part of the key to answering that new-age question, "Why do it sound friendlier if it's analog?"

You can bet your bit none of this soft stuff happens on that DAT you have sitting on the shelf behind you right now.

Wine and analog improve with age, until they mature, then they turn to mud. Beer and digital, on the other hand...

As an aside, I have always been fascinated with Steely Dan's *Aja*, as I feel it is the first and possibly the only analog album to sound digital. It's crispness, clarity and definition coupled with its dynamic range and use of air and space as musical components was shocking at the time, and still stands as a unique execution. Listen to *Aja*, and you almost feel that digital isolationism that I am talking about. Why and how was that achieved? I think I'll call some really old guy and find out... ■

SSC is on the phone now, listening to some undecipherable explanation.

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Allen Sides has recorded and mixed sessions for dozens of world-class artists such as Ry Cooder, Count Basie, Ray Charles, Sinead O'Connor and Brian Setzer.

David Schwartz, producer of this CD-ROM project, is the founder and former editor-in-chief of *Mix*.

"The Microphone Cabinet is now a required reference tool for all of our classes. It really shows students the importance of subtle differences between mics, but best of all, I can secretly use it too!"

David Gibson
Founder and Chief Administrator
California Recording Institute

"What a great educational tool! My students can now learn the technical specifications and the sonic characteristics of microphones which normally aren't available to them. With studio time in such demand, it's a great way to get to know the mics before going into the studio."

Wesley Bulla
Coordinator of Recording Studio
Curriculum
Belmont University

"Hey, I got the CD-ROM and it's great! Finally, you get a chance to look in a top engineer/producer's toolbox without having to buy all of the tools."

David Miles Huber
Author and musician

This unique, fully interactive CD-ROM lines up the top classic and contemporary professional microphones for a series of audio comparison tests on dozens of instruments. The disc features:

- A "Selector Cabinet" of both popular and classic mics for recording each instrument.
- 16-bit Red Book audio samples of the selected mics and instruments.
- Allen Sides' "Tips" for getting the best sound from each microphone.
- A high-resolution color photograph of each microphone and the mic placement setup for each instrument.
- Complete specifications for each microphone.
- A color photograph and description of each musical instrument.
- A "Microphone Basics" section by noted author John Woram.
- A directory of the microphone manufacturers.

This amazing disc features tests of 66 mics and 33 different instruments. The microphones were chosen from the world-renowned collection at Sides' Ocean Way/Record One studios in Los Angeles. Sort by microphone to check out the best instruments for each, or sort by instrument to see which mics you should use. **Item MC) \$69.95** plus \$9.95 shipping and handling.

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TASCAM 102 mkII / 103 Stereo Mixdown Cassette Decks



Best values for musicians, studio operators and production houses: the 102 mkII and the 103 consistently produce only the highest quality tape recorded output.

- They Feature:**
- 60dB signal-to-noise ratio combines with wide frequency response for high-fidelity sound reproduction using any type of cassette tape.
 - Industry-standard Dolby B/C noise reduction and Dolby HX Pro sound technology extends high frequency performance up to 6kHz and minimizes distortion.
 - Advanced bias-sensing electronics automatically chooses optimal recording settings for the type of tape you load—Normal, Metal or CrO2.
 - Record/Mute autopacer automatically inserts 4 seconds of silence between songs or broadcast segments.
 - Multi-function display clearly indicates transport mode, tape counter position, tape type and level indicator.
 - Multi-counter with both tape counter and run-time modes.
 - Independent L and R stereo level controls and master record level control.
- 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



The 202 mkIII provides high-fidelity sound reproduction and a wide frequency response, as well as a host of features that help you dub, edit, record or playback onto/from one or two cassettes easily and efficiently.

- Normal speed and high-speed dubbing.
- Autospacer automatically inserts 4 seconds of silence between songs or broadcast segments for pro quality tapes.
- Incorporates Dolby HX Pro sound technology to extend high frequency performance and minimize distortion on Normal, Metal and CrO2 tape.
- Allows you to quickly and easily 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.
- **Play** material on deck 1 while deck 2 records on one or both sides.
- **Record** simultaneously on both decks from an external master.
- **Play** back both sides of one or both decks in a continuous loop, up to five times.
- **Auto Reverse** automatically reverses tape direction during playback and record.
- **Repeat** rewinds tape and allows infinite looping during playback.
- **Timer** switch for unattended record/playback (timer required).

New! 302 Double Auto Reverse Cassette Deck

All the features of the 202 mkIII, the new 302 adds even more recording and playback flexibility. That's because the 302 is actually two fully independent cassette decks. Both decks have their own set of interface connectors, transport control keys and noise reducing functions.

- Auto-reverse capability on both decks
- Individual/simultaneous record capability—both decks
- Independent RCA unbalanced in/out for each deck
- Cascade and Control I/O let you link up to 10 additional machines for multiple dubbing or long playing record and playback applications

CD-601 Professional CD Player



- Frame-accurate cueing precision, extremely high-fidelity and a small form factor make the CD-601 ideal for post-production applications where sound effects and music are "flow-in" from compact discs. The CD-601 integrates with most post-production equipment including mixers, video editors and computer studio controllers.
- Balanced XLR and unbalanced RCA outputs
 - Precision cueing control and Auto cue
 - Linear motor-driven pick-ups eliminate dead air
 - Optional RC-601 remote control adds additional features and conveniences.
 - Optional BU-2 RAM for instant start and seamless loops up to three minutes

marantz

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 Stereo/Mono Heads	PMD-101 Mono 2	PMD-201 Mono 2	PMD-221 Mono 3	PMD-222 Mono 3	PMD-430 Stereo 3
Inputs/Outputs					
Mic Input	1/4-inch Built-in	Miniplug Built-in	Miniplug Built-in	Mini/XLR Built-in	1/4-inch
Condenser Mic Remote Jack	—	Yes	Yes	Yes	—
Modular Tel Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR	—	—	—	—	Yes
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	Yes	Yes	—
Manual Level Control Limiter	—	Yes	Yes	Yes	—
ALC	—	Yes	Yes	Yes	—
Peak Indicator	—	Yes	Yes	Yes	—
Playback Controls					
Pitch Control	±20%	±20%	±20%	±20%	±6%
Bias Fine Adj	—	—	—	—	—
Tone Control	Yes	Yes	Yes	Yes	—
Half-Speed Playback	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

- All models except the PMD-430 have 1/2 speed playback/record capability. With 1/2 speed playback musicians can slow down complicated passages for analysis. And when played back at 1/2 speed, the pitch is lowered by exactly one octave, so the notes are still musically correct—ideal for figuring out complicated solos or picking patterns.
- By recording at 1/2 speed, a three hour meeting can be recorded on a single tape. A built-in microphone and automatic level control make operation simple, and built-in speaker makes transcription convenient.
- 1/2 speed recording is equally ideal for churches because 90 minutes can be recorded on a single side of tape—no interrupting your recording to flip the tape over. Line inputs make it easy to use and connect to your existing sound system.
- Three standard 'D' cell batteries provide up to 7-1/2 hours of operation and the optional RB430 rechargeable battery delivers up to 5-1/2 hours.

Telex

ACC2000/4000 Series Cassette Duplicators

Designed for high performance and high production, Telex's ACC Series (ACC2000 ACC4000) and (ACC2000 XL/ACC4000 XL) of expandable duplicators also offer easy maintenance and unsurpassed 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 16 times normal speed and each can expand up to 27 copy positions (with additional copy modules). With the extra copy modules you can duplicate up to 27 copies of a C-60 original in less than 20 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, signal-to-ratio and bias. Additionally the ACC4000 XL allows for the chrome or ferric cassette duplication. XL models are available in stereo (ACC4000 XL) or mono (ACC2000 XL) versions.

Individual rotary audio level controls allow for an increase or decrease of audio levels as the master translates to the copies.	Short tape indicators alert you if a tape stops before the original does, identifying incomplete copies caused by jam or short.	Slanted work surface and unique "heads-up" cassette platform allow less oxide build up on the heads and makes cassette loading and unloading much easier.
• Peak reading LED indicators allow quick and accurate monitoring of audio fluctuations.	• Automatic or manual selection of record and copy operation: —Rewinds tapes to the beginning or end automatically (AUTO mode) or manually.	• Each cassette position has a three point tape guidance system that eliminates skew problems. Plus, when a tape is inserted, each cassette position is activated to prevent unnecessary wear and tear on the tape head mechanism.
• Slide A or B/B select button let you set up for duplication of either 1 side or both sides of a cassette at once.	• Slide A or B/B select button let you set up for duplication of either 1 side or both sides of a cassette at once.	• 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.
• Stop all tapes instantly, at any point during the copy or rewind cycle.	• Stop all tapes instantly, at any point during the copy or rewind cycle.	

- ACC2000 Mono Master Module:**
- 1/2 track two-channel monaural duplicator produces 3 copies from a cassette master at 30ips (16X normal speed).
 - Expands up to 27 copy positions by adding ACC2000 copy modules (four positions each).
 - Erase heads in the copy positions automatically erase existing audio as new material is being recorded.
 - Track select, short tape indicators auto/manual operation.
 - Includes removable power cord and protective dust cover.
- ACC2000 XL Mono Master Module:**
- Same features as ACC2000 plus—Extended Life cassette heads.
- ACC4000 Stereo Master Module:**
- 1/4 track, four-channel stereo duplicator. Same features as ACC2000 Mono Master Module.
- ACC4000 XL Stereo Master Module:**
- All features as ACC4000, plus—Extended Life cassette heads. Can be configured for chrome or ferric cassette duplication.
- ACC2000 Mono Copy Module:**
- 1/2 track, two-channel monaural copy module.
 - Each module has four copy positions with erase heads and controls for side select.
 - LED displays indicate end-of-tape status for each pocket.
 - Includes ribbon cables for connection to ACC2000 master and other copy modules.
 - Includes removable power cord and protective dust cover.
- ACC2000 XL Mono Copy Module:**
- Same features as ACC2000 Copy Module, plus—Extended Life cassette heads. Connects to ACC2000 XL Master Module.
- ACC4000 Stereo Copy Module:**
- 1/4 track, four-channel copy module. Has all the features of the ACC2000 Copy Module.
- ACC4000 XL Stereo Copy Module:**
- Same as the ACC4000 Copy Module, plus—Extended Life heads. Configurable for chrome or ferric cassette duplication.

Copyette EH Series Duplicators

The popular Copyette series produces high quality, low cost cassettes in large quantities at nearly 16 times normal speed. This means you can reproduce both sides of a C-60 tape in less than 20 minutes. Available in two versions, the Copyettes are capable of duplicating either one cassette or three at a time. In addition each are available in both mono and stereo models. They couldn't be easier to use. You simply insert the cassettes, press the START switch and they do the rest. They rewind all tapes to the beginning, copy them then rewind to the beginning again before stopping. The whole process can be stopped at any time by pressing the CYCLE button. Side Select feature allows you to set them up to copy one side of a tape or both sides at once.

- Stereo Copyette 1+2-1**
- Weighing only 8 lbs. (3.6 kg), this unit has a durable, impact resistant housing and includes a removable power cord, carrying handle and protective cover. It also has an optical, non-reflective end-of-tape sensing system that provides gentle tape handling. A mono version is also available.
- Stereo Copyette 1+2+3**
- This duplicator copies both sides of three cassettes at once, yet it's as small as the 1+2-1. It weighs only 12 pounds (5.4 kg) and includes a hard cover to protect the unit while not in use. It uses all DC Servo motors for the ultimate in reliability. A mono

TASCAM

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.

- Utilizes Dolby B or C noise reduction with Dolby HX Pro.
- Automatically selects proper bias type, so you get optimal recording & playback response with Normal, Metal or CrO2 tape.
- Gear independent input dials let you dial in stereo VU calibration with one dial. You can also adjust for channel specific calibration.
- Offers two Autolocator buttons and a MEMO IN control. These controls allow you to select two points on any tape for one button forward/reverse to wherever the action is. Additionally RTZ (return to zero) quickly spools the tape back to 0000 on the tape counter.
- Rear-mounted RCA input/output jacks for easy connection to high-quality sources.
- Optional LA-112 connector provides additional balanced or unbalanced XLR inputs and outputs. Installation is simple and requires no special tools.
- 25-pin D sub connector (parallel port) on the back, links the deck to the optional RC-134 remote control unit or for faster start from any mixer that use the same protocol.

112R mkII Bi-Directional Stereo Cassette Deck

The 112R mkII is a somewhat 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 that make it ideal for long program recording.

- All the features of the 112 mk II plus—**
- Three-head transport with separate high-performance record and playback heads. Manufactured from resilient Cobalt Amorphous materials, the independently-operating no heads combine with precision FG servo direct-drive capstan motors to provide the highest standards of reproduction quality and performance.
 - Frequency response is 25 Hz to kHz with less than 1% total harmonic distortion.
 - Equipped with Hysteresis Tension Servo Control (HTSC): the 112R will virtually eliminate wow and flutter. HTSC is an advanced servo control system that maintains consistent back tension on the tape all through the reel, combating inconsistencies brought on by extreme temperatures and humidity.
 - Super Acculign Rotating Head System allows recording or playback tape direction to be changed with one button. A single-screw azimuth adjustment makes it easy to maintain the head alignment after many hours of continuous use.
 - For unattended record playback of material that is longer than one side of a tape, there are two features that spare you from constantly attending to the deck. —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: layback up to 5 times or record in both directions without pausing to flip the tape and re-engage the record mechanism. Both features are accessible from the front panel, with one-button selection.

122R mkIII 3-Head Stereo Cassette Deck



The standard for production and broadcast facilities, the 122 mk III features smooth faultless tape handling mechanisms, a three head transport with high-performance Cobalt Amorphous record/playback heads and precision servo direct-drive capstan motors.

- All the features of the 112R mk II (no reverse of course) plus—**
- XLR balanced and unbalanced RCA inputs and outputs are selectable with the flip of a back-panel switch. There are 1/4-inch inputs on the front panel for simple and direct plug-in of line-level gear.
 - MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction.
 - Bias and level fine tuning for each channel. These tuners can be used in conjunction with the one-touch 400 Hz or 10 kHz oscillator adjustment signals to get proper VU calibration before or during each recording session.
 - Record/mute autopacer automatically inserts 4 sec. of silence between songs or broadcast segments for pro quality tapes.

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ALESIS
3630 Compressor

The 3630 provides two full-featured professional compressor/limiters in one rack space. Ideal for any application from studio recording and mixing to live sound reinforcement and broadcast.

- Dual mono or linkable true stereo operation.
- Choose between RMS and peak 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.
- Variable attack and release times and a sidechain function for "ducking" in broadcast applications.

t.c.electronic
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, flanging, phasing, 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 dithering tools, Tap and MIDI tempo modes and single page 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 (compressor, limiter, expander, gate and de-esser) are unique as stand-alone effects, but are particularly useful in combination with other effects. Those might be de-esser/room, gated hall or compressed pitch. The possibilities are endless.
- Tempo Tap function lets you match effects to the beat. Tempo can be adjusted in beats-per-minute and sub-divided any way you like—even in triplets. The tempo can also be read from MIDI.
- Preset "Gliding" (morphing) function ensures seamless transition between effects. Very useful in live and mixing situations.

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 acoustic performance that's ideal for recording studios, AV control rooms and 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.



Fostex
XR-5/XR-7 Multitrackers

XR-5 Features:

- High-speed (3-3/4 ips) four-track (2-tracks simultaneously) recorder with built-in Dolby noise reduction (can be turned off)
- Pitch controller varies the tape speed within a range of ±12%
- Punch in/out function makes corrections and phrase insertions when necessary, can be done easily with optional footswitch.
- Four inputs accommodate two microphones in channels one and two. Has convenient insert points for connecting a compressor/limiter and other devices for the mic channels.
- Each channel is equipped with two-point high/low shelving equalizers to help shape the sound, and an AUX send function for processing ambient system effects.
- Trim function lets you switch High/Mid/Low input levels for channels one and two.
- Alternate Mix mode lets you independently select the signal from the input jack or the tape playback. Prefader effect send, inline monitor & other functions are also possible using this mode.
- Post foldback (monitor) send function routes the foldback signal to the AUX send. When the foldback is activated you can actually mixdown at the same time you add reverb to a tape.

MIDI/TAPE multi-mix mode supports MIDI synchronization. Together with the Alternate Mix mode the XR-5 can simultaneously mix all MIDI sound source output with tape playback sound and effect output while monitoring!

The XR-7 has all the features of the XR-5 plus—

- 6 inputs, plus the ability to record four tracks simultaneously
- Dolby C noise reduction plus dual speed recording
- During recording, Channels 5 and 6 are the primary inputs for microphones and acoustic instruments. They have trim controls and mid-sweep EQ. During mixdown, these channels act as the main stereo L/R bus.
- Auto rehearsal mode lets you concentrate on the music instead of the machine.



TASCAM
PORTA 03 mkII Ministudio

The easiest way to get into multitrack recording, the PORTA 03 is an extremely economical 4-track recorder that lets you overdub as well as mixdown to standard cassettes.

- 4-track recorder with integrated two channel mixer
- Two 1/4-inch MIC/LINE inputs with trim control
- Extended dynamic range with Dolby B noise reduction
- 3-digit tape counter keeps track where you are on the tape
- Master level control for the entire mix, and the level send to LINE OUT for stereo mixdown
- Track selector indicates which of the 4 tracks you're recording to

SAFE selection keeps you from inadvertently recording over tracks you've recorded earlier.

- Headphone jack for comfortable monitoring
- RCA output jacks for mixdown to cassette

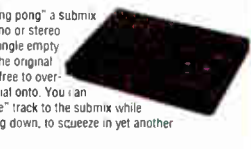


PORTA 07 Ministudio

The PORTA 07 packs high-end features into a compact and economical package. Achieves great sound with high speed tape transport, high-low EQ and DBX noise reduction.

- 4-track recorder with integrated four channel mixer
- Two 1/4-inch LINE inputs and two 1/4-inch MIC/LINE inputs with trim control.
- Separate high and low EQ for each track provides 10dB of boost or cut.
- dbx noise reduction for improved signal-to-noise ratio.
- Punch-in/out r. manually or with optional RC-30 footswitch
- Effects send with stereo return can be applied in varying amounts to all four channels

"Bounce or 'ping pong' a submix of multiple mono or stereo tracks onto a single empty track, leaving the original submix tracks free to overdub new material onto. You can even add a "live" track to the submix while you're bouncing down, to squeeze in yet another track.



424 mkII Portastudio

The 424 is premium Portastudio that takes multitrack recording to the next level. Features superior audio quality, balanced XLR inputs, enhanced equalization and a big-studio style AUX section

All the features of the PORTA 07 plus—

- 4-track recorder with 8-input mixer (4 mono MIC/LINE inputs with 1/4-inch and balanced XLR jacks and 2 stereo inputs with 1/4" jacks.)
- Separate 3-band EQ section for each of the four mono channels with 10dB of boost or cut and sweepable midrange
- Auto Punch in/out with rehearsal, plus a Repeat switch lets you set up a tape loop that goes over the same area of a tape while you practice your punch-in/out and overdub moves—without committing a single note to tape
- Two independent dedicated AUX sends let you use more effects or use one as tape cue during tracking

Dual-speeds, logic-control tape transport system improves tape handling and sound quality. Select 3-3/4 inch per second HIGH speed for the best possible recording quality or NORMAL 1-7/8 ips speed.

- Monitor output makes it easy to connect an external monitor amplifier without rethreading—at mixdown.
- Tape DIRECT OUTS are provided for integration with external mixers.



MIDI Musicians Take Note!—If you've got MIDI keyboards, drum machines and sound modules in your set up, you can exploit the power of "virtual tracking" with either the PORTA 07 or 424/444/488 Portastudio. You can use a MIDI synchronizer like the Tascam MTS-30 MIDI-Tape Synchronizer to record (trigger) a code onto track 4 (Track 8 with the 488). Just select SYNC mode on the DBX switch and record the tone to tape. After stripping the tape with FSK or Song Position Printer information, all your MIDI instruments will faithfully follow the tape during playback and recording, even if you slow or speed the tape using the PITCH controls. The big benefit is that your MIDI tracks (called virtual tracks) don't actually have to be recorded until final mixdown, giving you lots more unused tracks to record on.

464 Portastudio

The functionality of a pro recording studio in a small, lightweight package, the 464 Portastudio is a full-featured eight input, four-track cassette recorder complete with a 12x2 internal mixer and dual buss design that lets you create separate recording and cue mixes.

All the features of the 424 mk II plus—

- 4-track recorder with 12-input mixer (4 mono MIC/LINE with 1/4-inch and balanced XLR jacks, 4 stereo 1/4" jack pairs.
- Channels 1-4 offer High and Low shelving EQs and a sweepable Mid EQ. Tracks 5-6 and 6-7 have shelving EQ only, while 9-10 11-12 are best used with input that has its own internal EQ.



488 mkII Portastudio

When 4 tracks are just not enough, then you need the perfect creative tool—the 488 mkII Portastudio. The most cost-effective 8-track recorder on the market, the 488 not only offers additional capacity but versatile capability and intuitive operation for easy capturing & manipulation of your ideas.

Whether recording acoustic or electronic instruments or vocals, the 488 offers maximum creative freedom to produce your best work. With all the functionality of a professional studio, the 488 may be the ultimate demo recording machine.

All the features of the 464 mk II plus—

- Includes phantom power for use with high-quality condenser microphones.
- Built-in mixer features low-noise circuitry, with 12 inputs and 2 group busses. There is a separate input for your stereo master recorder.
- Each of the 8 main input channels includes individual 3-band equalizers. You get Hi and Low shelving EQs, plus a semi-parametric sweepable midrange EQ.
- Unique multi-mix mode with the capability of handling up to 20 inputs at mixdown
- The only 8-track cassette that offers a servo controlled tape transport complete with electronic braking. Equipped with a high-performance Hysteresis Tension Servo Controller (HTSC) tape transport, the 488 delivers better sound than the first 8-track reel-to-reel machines.
- HTSC maintains precise and consistent tape tension from the beginning until the end of the tape. It actually dynamically adjusts the back tension on the tape as it moves from one end to the other, allowing precise locating capability.



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

With much of today's popular music demanding more bass at louder volumes than a small near field monitor can possibly produce—the Monitor Two delivers—at a price no higher than many of these smaller speakers.

- Utilizes a 10" three way speaker design with a unique asymmetric crossover to maintain the same accurate tonal balance and imaging of the Monitor One—but with a much larger sound field.
- 10" low frequency driver incorporates Alesis' SuperPort speaker technology to provide powerful, extended bass
- 5" mid frequency driver offers exceptional mid frequency detail
- 1" silk dome high frequency driver delivers a broad but natural frequency response from 40Hz to 18kHz.
- Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy.



TANNOY
PBM Series II
Reference Monitors

The PBM II Series is the industry standard for reference monitors. They feature advanced technologies such as variable thickness, injection molded cones with nitrile rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected inductors. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability and most important, real world accuracy.



PBM 5 II

- Custom 5" injection-molded bass driver with a nitrile rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- Woofer blends seamlessly with the 7" polyimide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring.
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density medite for minimal resonance and features an anti-diffraction radused front baffle design

PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" lowfrequency driver and 3/4" tweeter are led by a completely redesigned hardwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

PBM 8 II

- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-ware capability and utilizes the finest high power polypropylene capacitors and components available.
- Full cross-braced matrix medite 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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SPIRIT FOLIO LITE

Compact Professional Mixing Console

- 12 inputs as standard (up to 16 in mixdown)
- 4 mono channels & 4 stereo channels
- Inserts on all mono inputs and mix outputs
- Ultra low-noise (-129 dB EIN) mic inputs
- Musically responsive 2-band EQ
- 2 Aux sends on all channels. Aux 1 switchable pre/post fader
- PFL Solo on all inputs, dedicated tape return
- Headphone socket and discrete LR outputs for monitors
- 10-segment three color bar graph metering
- Consistent high performance controls, global phantom powering
- Optional rack mounting panel and PortaPower Unit



FOLIO SI

Stereo Input Mixing Console

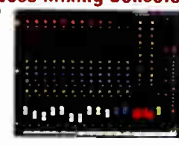
All features of Folio LITE PLUS—

- 18 inputs as standard (20 including stereo returns)
- 8 stereo channels and 2 mono channels, with 60mm faders
- Comprehensive 3-band EQ on inputs 1-14
- High pass filter on mono inputs
- Dedicated tape return and control room outputs
- Insert points on L and R master outputs
- 12-segment bar graph metering
- Main outputs are ground compensated and impedance balanced
- Free standing or rackmount versions available
- Optional Porta Power unit allows battery powered operation from various sources

FOLIO RAC PAC

4-Bus Multi-Purpose Mixing Console

- 14 input channels with up to 28 inputs at mixdown
- 2 stereo inputs with 60mm faders and 2-band EQ
- Low-noise (-129 dB) mic inputs
- Comprehensive 3-band EQ with sweep Mid, plus high pass filter on every mono input
- 6 versatile Aux sends, 4 dedicated fully-fledged stereo returns plus 2 stereo effects returns
- Stereo solo-in-place (PFL) on every input channel
- Direct outputs on each mono channel for recording direct to multitracks
- Dedicated 2-track tape return routable to mix
- Global phantom powering, compact 8U rack-mount design



POWERSTATION

Powered Mixer

Studio quality mixing, with integrated power amp and effects provide an all-in-one solution for live performance.

- 8 mono and 2 stereo input channels
- 18 inputs at mixdown, including tape and effects returns
- Bullet-proof UltraMic pre-amps with 60 dB gain range for stunning signal handling capability
- High-spec 265W +265W (RMS) power amp
- Built-in Lexicon effects mixer
- Consistent high performance controls: PFL solo on all channels
- 3-band EQ with sweep mid-frequency on mono channels
- 2 auxiliaries for effects and foldback
- 7-band precision dual graphic EQ
- High pass filter on mono inputs
- 40 Hz subsonic filter on outputs to protect speaker cabinets
- 48V phantom power
- Inserts on mono channels and main outputs
- Separate power amp input to amplify external sources
- Dedicated record outs and tape returns, dedicated mono output
- Rugged steel chassis, hinged cover for protection



PROTRACKER

In-Line Multitrack Recording Console

In-line monitoring signal format - 2 discrete inputs per channel

- 8 channels with 60mm faders
- Expansion sockets for daisy-chaining ProTrackers
- High quality, high gain mic pre-amp (-129 dB)
- 5Hz - 15kHz with switchable 48V phantom power on every input
- Switchable high pass filter on every channel
- Built-in Limiter (300ms attack time/3 sec. release) selectable on every channel. Overload and limiter indicators on each channel
- Insert and aux switchable between channel and monitor paths
- Aux globally switchable pre/post fader
- Monitor fader and pan control
- Balanced tape & send/return, switchable between -4dB & -10dB
- Separate pre-fade insert and return sockets eliminating the need for Y-cables
- Inserts switchable to mix to allow simultaneous front -of- house mixing and recording
- Mix routable to tape sends 7/8 for simultaneous 2-track recording on a single multi-track, without effecting multitrack feeds from channels 1 to 6
- Headphone monitoring of 2-track return, aux 7/8 or mix
- Monitor outputs follow headphone output
- Mix output & 2-track return accept +4dB XLRs or -10 dB RCA phono



SAMSON MIXPAD 9

Ultra-Compact 9-Channel Audio Mixer

A remarkably compact 9-channel mixer, the MIXPAD 9 offers professional audio performance and a wide range of user-intensive features. It boasts low noise and distortion specifications, includes wide-range gain trim controls for both mic and line inputs and provides exceptionally low group delay over the full frequency bandwidth for a more transparent, open sound. It also has a very high slew rate—usually found only on larger, more expensive mixing consoles—allowing it to react very quickly to transients and maintain a crisp, articulate sound. It offers phantom power (48V) for use with condenser microphones and an in-line power supply eliminates magnetically-induced hum.

- 3 mic/line inputs and 3 stereo channels (total 9 inputs)
- 2 auxiliary sends for effects and two Stereo returns
- Independent 2-band shelved EQ, pan control for mono channels and balance control for stereo channels
- Adjustable mic input trims allow use with a wide variety of mics
- Phantom powered XLR mic input connectors
- Peak LEDs for left and right main outputs
- Extremely durable, extruded aluminum chassis



MICRO SERIES 1202-VLZ

12-Channel Ultra-Compact Mic/Line Mixer

Usually the performance and durability of smaller mixers drops in direct proportion to their price. Fortunately, 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 8Hz, high EQ at 12.5 kHz and two aux sends with 20dB gain
- Master section includes two stereo returns, headphone level control and metering
- Sealed rotary pots resist and other contaminants



NEW! MS1402-VLZ

14 x 2 Compact Mic/Line Mixer

Mackie's fanatical engineers have done it again. Balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room feature. Nice long 60mm faders, six studio-quality mic preamps and extra ALT 3-4 stereo bus—in less than 1.3 square feet of space.

- Studio grade mic preamps (chs 1-6) with high headroom, low noise and phantom power. Also incorporate low cut filters to cut mic handling thumps, pops and wind noise. Lets you safely use low shelving EQ on vocals
- Trim controls (chs 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 LR 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 tape monitoring, mixdown and live sound versatility
- Mute switch routes channel output to extra ALT 3-4 stereo bus. Use it for feeding multitrack recorder channels, creating a sub-group via control room/phones matrix, monitoring a signal before bridging 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.



NEW! CR-1604 VLZ

16-Channel Mic-Line Mixer

The hands-down choice for major touring groups, studio session players, as well as broadcast and sound contracting. The new CR-1604 VLZ features everything you would expect from a larger console, and then some! 24 usable line inputs with special headroom/ultra-low noise Unityplus circuitry, seven AUX sends, 3-band EQ, constant power pan controls, 10-segment LED output metering and discrete front end phantom-powered mic inputs.

- Lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range). Many drummers consider it the only mixer capable of handling the attack and transients of acoustic and electronic drums
- Genuine studio-grade phantom powered, balanced input mic preamps on channels 1-6. All CR-1604 VLZ and optional XLR 10 for ten) discrete input mic preamps incorporate four conjugate-pair, large-emitter geometry transistors. So, whether recording nature sound effects or heavy metal, mixing flutes or kick drums, you get the quietest, cleanest results possible.
- True 4-bus design with channel assigns to 1-2 3-4 or main L-R
- 3-band EQ with mid-frequency sweep and low cut switch
- AFL/PFL solo and mute switches with overload, indignant present indicators
- Rear panel features include insert points and 1/4-inch XLR connectors on every channel, as well as RCA tape inputs/outputs
- New, standard size channel trim pots are found at the top of each channel
- Rotary input/output "pod" allowing three different positions for set-up



TASCAM M2600 mkII Series

16/24/32-Channel 8-Bus Mixers

LOW NOISE CIRCUITRY

- Combining completely redesigned low noise circuitry with Absolute Sound Transparency™ the M-2600 delivers high-quality, extremely clean sound. No matter how many times your signal goes through the M-2600, it won't be colored or altered. The signal remains as close to the original as possible. The only coloring you hear is what you add with creative EQ and your outboard signal processing gear.
- Double reinforced grounding system eliminates any hum
- World-class power supply provides higher voltage output for better headroom and higher S/N ratio

PREMIUM QUALITY MIC PRE-AMPS

- The M-2600's mic pre-amps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel.
- Accepts balanced or unbalanced 1/4" inputs and low-impedance XLR jacks. Better still, the TRIM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the 20 dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug in anything—keyboards, guitars, basses, active or passive microphones, samplers and more.

THE BEST AUX SECTION IN THE BUSINESS

Versatile AUX section has 8 sends total, 2 in stereo. Send signal in stereo or mono, pre- or post-fader. Available all at once. Return signal through any of 6 stereo paths.

ERGONOMY

Bi-directional split ED means you can use either or both EQ sections in the Monitor or Channel path—or defeat the effect altogether with one bypass button. Other comparably priced mixers will lock the shelving mix into the Monitor path or, limiting your EQ application.

ADVANCED SIGNAL ROUTING OPTIONS

Direct channel input switching. Assign to one of eight buses, direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching.

THE M-2600 HAS A BIG STUDIO FEEL

All buttons are lightly spring loaded. Lock into place and accommodate even the biggest fingers. The faders and knobs have a tight "smooth" "expensive" feel; are easy to see, reach and manipulate. Center detents assure zero positions for EQ and PAN knobs. Smooth left/right 100mm faders glide nicely yet allow you to position them securely without fear of accidentally slipping to another position.



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



Stewart

Power Amplifiers

PA-1000
PA-1400
PA-1800




Performance Series Amplifiers

PA-1000 weighs 9 lbs, is 15" deep and occupies one standard rack space. Delivers 1000 watts into 4Ω when bridged to mono.

PA-1400 weighs 16 lbs, is 15" deep and takes 2 standard rack spaces. Delivers 1400 watts into 4Ω when bridged to mono.

PA-1800 weighs 17 lbs, is 17" deep and takes two rack spaces. Delivers 1800 watts into 4Ω when bridged to mono.



Performance Series 1

300 Watt Power Amplifier

- Measuring only 3.5 inches high and weighing 26 pounds, the Series 1 delivers more than 150 watts per channel.
- Its welded steel chassis is unbelievably strong while a custom heat sink extension provides exceptional thermal capacity.
- An internal fan provides quiet background noise levels for critical monitoring applications and when pushed hard the cooling system insures continuous cool operation even in the most demanding situations.
- Active balanced inputs with both XLR and 1/4" phone jacks.
- Supplied with quality 5-way binding posts for highly reliable speaker connection.
- Front panel handles are reversible for either rack mount installation or easy handling.
- LEDs are provided for signal presence and clip indicator; the detented gain controls have large knobs for easy front panel adjustments.

Performance Series 2

600-Watt Power Amplifier

Same as above except the Series 2 weighs 32 pounds and delivers more than 300 watts per channel.

Performance Series 4

1200-Watt Power Amplifier

Same as above except the Series 4 weighs 53 pounds and delivers more than 600 watts per channel.

Has a switch selectable clipping eliminator that prevents damage to the speakers.

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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 using 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.



SONY TCD-D8 DAT Walkman Player/Recorder

- Long Play (LP) mode allows 4 hours of record/playback of 12-bit audio on a single DAT cassette
- Equipped with digital coaxial and optical connectors, it also has analog Mic and Line inputs
- High-speed Automatic Music Sensor search function finds & plays tracks, skips forward or back up to 99 tracks, all at 100x normal speed
- Digital Volume Limiter System increases listening comfort & sound quality by automatically adjusting for sudden level changes
- Two-speed cue-rev winds lets you hear sound while player is in fast wind modes, up to 3x or 25x normal speed
- LCD display with backlit windows clearly shows recording level, track number, operating status and 4-segment battery indicator, even in low ambient light conditions
- Optional RM-D3K System Adapter Kit for complete digital interface. It has input/output connectors, for both the optical cable & the coaxial cable. Also includes a wireless remote control.



TCD-D10 PRO II Portable DAT Recorder

- Has balanced XLR input, switchable mic (-60dB) or line (+4dB) inputs. A 12-pin digital connector provides interfacing with AES/EBU digital signals of 32-44 1/48 0 kHz sampling rates
- Comprehensive self-diagnostics function constantly monitors the rotation of the head drum, capstan and reels. The tape transport mode and load/unload time are continuously checked as well
- Up to 99 start IDs can be recorded in the subcode area. When the record button is pressed, the start ID is recorded automatically for 9 seconds. During recording, it can also be added manually to any position of the tape. Search for start IDs is 100x normal speed
- 20-segment digital peak level meters include overload indicators. Closely tracks input signal for accurate level indications
- During playback, the date and time of recording is displayed
- Has a record-level limiter with a fast attack time of 300ms. Mic attenuator prevents distortion by suppressing signal level 20 dB
- Immediate playback is possible through a built-in speaker
- Supplied wired remote controller also accepts a mic holder. Two mic stand screw adapters are also supplied
- Supplied NP-22H rechargeable battery provides 1 1/2 hours of operation. Optional NPA-D10 battery adapter enables 1 hour on AA batt. Supplied ACP-38 AC adapter operates on 100-240V 50/60 Hz



PORTADAT PDR1000/PDR1000TC Professional Portable DAT Recorders

- Direct drive transport with 4 heads for confidence monitoring
- Balanced XLR mic and line analog inputs and two RCA analog line outputs. Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU balanced XLR
- Left/Right channel mic input attenuator 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 PD1000 recorder, the PDR1000TC is equipped to record, generate and reference to time code in all existing international standards
- All standard SMPTE 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 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.

- HIGHEST QUALITY SOUND**
- Sampling rates of 48/44.1/32 kHz • 24-bit internal processing
 - 18-Bit A/O and D/A with 128 and 8 times oversampling
- POWERFUL EDITING**
- Time compression, pitch compression
 - Non-destructive cutting, erasing, copying
 - Fast looping for music or ambience editing
 - Six levels of waveform zoom
 - Optional RS-422 interface
- FULL AUTOMATION**
- Microscope editing of automation data
 - Dynamic and snapshot automation of level, pan, 2-band EQ, including frequency select, boost and cut
 - Phase level editing of level, crossfade and fade in/out
- TRIGGER FEATURES**
- Trigger mode to play any combination of 8 tracks for vocal fly ins or sound effects placements
 - Advanced trigger mode for live operation with preset or dial up cue of phrases to be played one after another
- PROJECT CATALOGING**
- Up to 150 projects on line at once
 - Cataloging of sound effects and projects
 - Easy transfer of sounds from one project to another
- MIDI FEATURES:**
- MIDI machine control • Internal tempo master • MIDI clock and song position pointer output • 8 MIDI triggers for instant phase playback • MIDI trigger of record and punch input • Tempo maps from external sequences, MIDI or tap input.
- RECORDING OPTIONS**
- Records to standard SCSI hard drives
 - Up to 24 hours recording time possible
 - Uses MO Squester or Jazz drives for fast project change overs
- FLEXIBLE I/O STRUCTURE**
- Full digital patch bay
 - Stereo AUX send bus, 2 stereo AUX returns
 - Digital stereo input and two digital stereo outputs • Direct channel outs
 - 4 balanced analog inputs with gain controls and 4 balanced analog outputs
- ACCURATE SYNCHRONIZATION**
- Frame accurate sync to any time code
 - Generates/reads SMPTE time code—24 25 29 97 (Drop/in drop) and 30 frames per second • Locks to MTC

Digital Multi-Track Recorders

TASCAM DA-88

The first thing you notice about the eight channel DA-88 is the size of the cassette—it's a small H-8 video cassette. You'll also notice the recording time—up to 120 minutes. These are just 2 of the advantages of the DA-88's innovative use of 8mm technology.

• 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 audio 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 sampling 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 RDC-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-to-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 multi-track recording. With new features & 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 automation.
- Stunning Audio:**
- Incorporates ultra-high fidelity 18-bit, 128 X oversampling A/O converters which provide better-than-CD audio quality.
 - For outputs, the D/A converters provide 20-bit, 8x oversampling performance for a flatter frequency spectrum, improved phase response and much less low-amplitude distortion.
 - 20 Hz to 20kHz ±0.5dB frequency response, 92dB S/N ratio, crosstalk between channels better than -90dB @ 1kHz
- Onboard Autolocator with Auto Record:**
- Onboard 10-point autolocate system provides quick access to mu-tape locate positions. Four specialized locate points make your recording sessions quicker and easier.
 - Auto play the moment any autolocate point is reached. Auto Return automatically rewinds at the end of a loop.
 - Auto Record function lets you automate punch-in/punch-out times that are accurate to 1/100th of a second.
 - Rehearse Mode allows you to enter or exit record modes without actually laying tracks to tape.
 - To record on the fly, you can even use the individual Record Enable buttons to punch in and out of tracks.
 - Includes remote control with transport and locate functions. Offers a footswitch jack for hands-free punch-in.
- Intelligent Transport:**
- Advanced transport software continuously monitors autolocate performance and the head constantly reads ADAT's built-in sample-accurate time code—even in fast wind modes.
 - Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.
- Flexible Inputs and Outputs:**
- Servo-balanced 56-pin ELC0 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.
 - Multiple Optical Digital I/O carries up to eight tracks at once. The digital I/O combined with the ADAT Synchronization Interface make it completely compatible with any ADAT-format recorder or other devices that use Alesis' proprietary digital protocol.
- Digital Editor:**
- 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.
 - Use multiple ADAT-XTs and Tape Offset lets you copy and paste not only track to track, but from location to location. Tape Offset assembles your project with a minimum of repetitive overdunding and changes the tape position of a slave XT to its master, so you can "fly" audio to different locations on each tape.
 - Track Delay can delay the time reference of a track by up to 170ms. Also easily change site groove of a tune. Track Delay is individually adjustable on each channel and is excellent for fixing slight timing errors in recorded tracks (player lags behind or rushes the beat), in recordings with multiple microphone or time-align each track, precisely compensating for the spacing between mics with accuracy to 0.0001 seconds.



Panasonic SV-3800/SV-4100 Professional DAT Recorders



Designed for professional applications, the SV-3800/SV-4100 have highly accurate and reliable transport systems with search speeds up to 400X normal, and 20-bit D/A converters to satisfy the highest professional expectations both in terms of sound and functionality.

SV-3800 Features:

- Recording via analog inputs offers sampling rates of 44.1 or 48kHz. When recording through digital inputs, it automatically clocks to incoming frequencies of 32/44.1 or 48kHz.
- XLR-balanced digital inputs/outputs plus consumer format coaxial and optical inputs/outputs. XLR-balanced analog stereo inputs/outputs. Output level is selectable between +4dB and -10dB. The input level is +4dB.
- Built-in shuttle wheel has two variable speed ranges: 3 to 15x in Play mode and 1/2 to 3x normal speed in Pause mode.
- High speed transport enables searching up to 250x normal speed. Searched up to 400x normal speed is possible once the tape has been scanned in Play, FF or REV mode. This ensures access to any point on a two-hour DAT in under 30 seconds.
- Ramped record mute and annunciate with three seconds fade-in and five seconds fade-out provides automatic level changes at the start and end of a recording.
- Comprehensive display includes program numbers, absolute time, program time, remaining time and Table of Contents.

SV-4100 Has all the features of the SV-3800 Plus—

Offers enhanced performance required for professional production, broadcast and live-sound systems. Features such as instant start, external sync capability and enhanced system diagnostics make the SV-4100 the DAT quality standard.

FOSTEX D-5 Digital Master Recorder

With professional features and a consumer price tag, the D-5 satisfies a lot of requirements. It records or plays back four hours of music, includes optical and digital input/output, and TDC functions that are as easy to use as a CD player. It's also equipped with basic pro features such as ID editing function, GPI and XLR connectors and 300X speed locate and search functions.

- Playback/record audio with 32/44 1/48 kHz sampling in SP (standard play) mode. Equipped with LP (long play) mode. It can play/record at 32 kHz up to 4 hrs. on a 120 minute cassette
- Analog interface includes switchable (+4dB/-10dB) balanced and unbalanced XLR inputs and outputs.
- AES/EBU digital interface (XLR) for professional use and optical (S/PDIF) input/output for consumer/semi-pro connections
- 5-pin GPI input connector allows Play Stop & S-ID search to be implemented through commands from an external source
- Records CD-Q code sync ID, enabling precise music start up.
- When performing digital signal transfer from CD through its optical input, the D5 precisely records S-IDs according to the track number and index information of the CD-Q code. So even if there is a break in the middle of a song or there isn't a non-recorded section between two songs, you can locate to the S-ID location (eg. beginning of song) precisely.

D-10 Digital Master Recorder



- Switchable 44.1 and 48kHz sampling frequencies
- Analog interface includes switchable XLR-balanced (+4dB) and unbalanced RCA (-10dB) inputs and outputs
- Equipped with XLR-balanced AES/EBU digital interface and optical (S/PDIF) input/output conforming to IEC consumer
- Built-in 8MB RAM (4 MB x 2) offers instant start as well as scrubbing at 1/2 second accuracy
- Advanced jog/shuttle for precision cueing and monitoring
- Auto Cue provides automatic locating to the exact start of audio modulation during ID search and tape loading
- Universal GPI input/output enables easy and fast assemble editing, based on A-time between a pair of D-10s
- Switchable 2-position reference level -12dB/-20dB
- Start and Skip IDs as well as up to 799 P-NDs can be recorded and played back
- 10-digit keypad lets you store and recall 100 cue points
- Continuous or peak reading level meters can display available headroom with an accuracy of ±0.1dB
- Reads and displays A-time or Pro R-time, also provides PCM monitoring
- Optional 8333 interface card adds timecode and RS-422 (X 2) functionality to the D-10
- Reads an external timecode and records on the sub-code area
- Reproduces and outputs the timecode from sub-code area
- Replicates RS-422 and ESBus protocols. Using the ESBus, up to 16 D-10s can be daisy chained.

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—FROM PAGE 90, ROY HARGROVE QUINTET

ciously pounded the coast for two hours. The concert was moved indoors to the large foyer, which acoustically resembled a colossal marble bathroom. Because we had to reset our gear and time was running out, I was forced to go with a simple live-to-DAT approach, employing virtually the same setup as used at UNEAC. I placed AKG 391s for the grand piano and used the Mackie CR 1604 in place of the MS 1202.

EL ESQUINA DE JAZZ SUNDAY, FEBRUARY 18

Each year, a traditional "end-of-the-festival" house party takes place in one of Havana's barrios. While we waited to depart for the 1996 fete, Clothier told us how in February 1990, he happened to meet the hosts and was invited. Clothier and his accomplices at the time, Dizzy Gillespie and Carmen McRae, had been greeted by the host, Gilberto, a splendidly gracious septuagenarian, who told the legendary trumpeter, "Dizzy, I've waited a lot of years for this day!"

The Esquina de Jazz is, in fact, Gilberto's living room, and on special occasions it becomes a swinging memorial to the Harlem club scene that flourished during the first half of this century. Among the residents here in the Santa Amalia district of Havana—one of the poorest in the city—is a colony of some of the same Harlem denizens who made uptown Manhattan jazz spots so vibrant. Like other foreigners seeking the freedoms of Cuba's unrestrained 1950s culture—and, without a doubt, the hottest dance bands on the planet—these Americans traveled freely between the States and Cuba until Castro's revolution. At the time of the blockade, anyone in Cuba without a lifeline in the form of cash or connections was trapped, and a sizable population of Harlem jazz fanatics became Cubans.

Warned by Clothier that the Esquina de Jazz was the least-suited venue for recording, I used the simplified DAT approach. I found a space in the corner near an AC outlet—possibly the only one in the place—and hoped it could muster 110 volts. A combination of the SASS for the en-

semble plus the ATM-35 for bass was ample, mixed with the Mackie MS 1202 straight to DAT, again via the Symetrix 620 converter. When Hargrove and the band began their first number, the place turned upside down, and dancing began—funky, elegantly sensual, shuffled versions of the Charleston, the Lindy Hop and the jitterbug. Plenty of dancing crowd effects are in the mix; this was actually part of the plan, as well as a natural consequence of using the broad-patterned SASS in such a small room. The



The end-of-the-festival party at El Esquina de Jazz

room was small enough that the shine of Hargrove's horn and Blake's sax landed clearly among Riggins' cymbals and bouncy double-skinned kick drum. With the reinforcement of the bass bridge mic, I quickly found a "set it and forget it" mix—there was no room for me, Cannon and his bass in the corner—and the result was one of the more lively recordings of the visit.

CASA DE MUSICA TUESDAY, FEBRUARY 20

One welcome discovery made during the visit was the depth of talent among Cuban jazz musicians. With the generous help of Chucho Valdes, Clothier organized a closed-door recording session for the Quintet and the small army of Cuban jazz wizards they had met and jammed with. It took place three days after the festival at a brand-new theater in Havana called the Casa de Musica. Essentially an auditorium without seats or a balcony, the square room appeared to hold about 500 people, with a large bar and an outside restaurant.

Because the session was closed-

door, I was able to install the full-fledged DA-88 setup in the middle of the room and use the Mackie MS 1202 to provide a stereo audio feed for the state-run TV station, Television Cuba, which taped the sessions. The microphone array was as before: 391s on piano, M-88s for two horns, ATM-35s for bass and drum overheads, and Audix D-2s for kick drum and stereo congas. I rummaged through my auxiliary mic collection to cover the other players that joined the Quintet. The Crown SASS-P MkII once again provided exemplary service as the room and overall stereo mic.

Hargrove and his band were joined for the first four numbers by Chucho Valdes at the piano, congero Anga and timbalero Changuito. This lineup was later augmented with flute, trombone, alto sax and guitar by some of Chucho's bandmates from Irakere. The guitar player, in fact, was an elder statesman who was among the first to bring modern jazz to Cuba, thus bringing our extraordinary trip full circle.

...

On February 24, two days after returning to New York, memories of our trip turned melancholy when we learned that two small aircraft piloted by Cuban expatriates—members of the anti-Castro movement *Hermanos a Rescate* (Brothers to the Rescue)—were shot down by Cuban jet fighters in the tensely guarded waters between Cuba and Florida. Immediately following came calls for revenge on Castro and accusations of murder of unarmed civilians. An angry mood swelled in the Cuban expatriate community, and many called for the American Interests Section in Havana to be shut down. Ultimately, there was a tightening of the already comprehensive American economic blockade on Cuba. I now find myself in the bittersweet position of having been possibly the last person this century to record the magic, the thunder and lightning, of Cuban and American musicians in the free dance of jazz under Cuban skies. ■

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—FROM PAGE 120, SIX MIC PREAMPS

preamplifier they were listening to. The units are presented here in order of increasing price.

AUDIO UPGRADES (\$100/CHANNEL, PLUS \$75 INSTALLATION)

Male Vocal: Natural, good across range (Fox); Warm and natural, nice sound (Garfinkle); Close to #6 [Peavey], a bit ugly on the top end, thinner (Olsen); Smooth clear top, good air (Rando).

Female Vocal: Very natural, but weak overtone (Garfinkle); Narrow (Monda); Natural, flattering, full top (Fox); Even but hyped (Paul); Good (Crigger); Real (Rando).

Tenor Sax: Warm (Garfinkle); Bright, cuts through, less low end (Fox); Not bad (Paul); Allows a little edge to the sound (Olsen); Very good, less midrange (Sheppard); Natural, lots of breath (Rando).

Guitar: Nice and clean (Garfinkle); Nice, helps sound of instrument (Fox); Some subtle distortion (Paul); Sounds brighter than #6 [Peavey], clearer in sound, no bottom (Olsen); Best top, bottom, impressive (Rando).

Piano: True sound (Garfinkle); Tubby (Monda); Nice, commercial sound (Fox); Roomy (Paul); Accurate (Crigger); Thinner (Olsen); Clean attack, good lows, least color (Rando).

dbx MODEL 286 (\$349)

Male Vocal: Brighter, cleaner (Garfinkle); Low mids, I'd roll some out (Fox); Veiled, distant (Crigger); Cleaner than #4 [Aphex] (Olsen); Good sibilance, thin bottom (Rando).

Female Vocal: Colored slightly (Fox); Close to #4 [Aphex] (Olsen); Brighter, somewhat brittle (Garfinkle); Unclear (Crigger); Thin low end, clean top, smoother than #4 [Aphex] (Rando).

Tenor Sax: Warm, honest (Fox); More room (Crigger); Begins to open, still muted (Olsen); More sound, clean (Garfinkle); Hard upper mids (Rando).

Guitar: True and clear (Garfinkle); Similar to #4 [Aphex], top/bottom missing (Olsen); No bottom, better top (Rando).

Piano: Warmer, still unclear (Garfinkle); Thinner, okay but not best (Fox); Dull-sounding (Crigger); Peaky top, small bottom (Rando).

BELLARI RP220 (\$499)

Male Vocal: Most natural yet (Garfinkle); Very nice consonants (Fox); Natural bass boost (Monda); Sound in balance (Paul); Brighter still, catches

the gravel in his voice (Olsen); Dark top end, less forward, small (Rando).

Female Vocal: Warm, best at main volume (Garfinkle); Good definition (Fox); Natural, best (Monda); Best so far (Paul); Nice, smooth, nice top (Crigger); Plain-sounding, not flattering, dark top, thin bottom (Rando).

Tenor Sax: Brittle? (Garfinkle); Definition, more hi-mids, not tons of lows (Fox); Good, very natural (Monda); Best of all so far (Paul); Smooth-sounding (Olsen); Transparent (Sheppard); Articulate, slightly harsh high end (Rando).

Guitar: Warm, top a bit dull (Crigger); Not as clear (Garfinkle); Natural, no hype (Fox); Good, natural (Monda); Best, cleanest (Paul); Warm, top a bit dull (Crigger); Where's the top color, harmonics? (Olsen); Crisp top, clear (Rando).

Piano: True sound (Garfinkle); Okay—no hype (Fox); Good, natural (Monda); Best of all (Paul); Muted mids—distant, thought might be just softer (Crigger); Clean, lacks bottom (Olsen); Good low end, dark top, peaky mids (Rando).

APHEX TUBESSENCE MODEL 107 (\$595)

Male Vocal: Flat, no hype (Fox); Like a gauze over the voice, lacks clarity (Olsen); Veiled (Sheppard); Dull, muddy (Garfinkle); Stuffy, dark (Rando).

Female Vocal: Good (Monda); Distor-

tion (Paul); Not as dull (Garfinkle); Again, no hype (Fox); Top end muted, pushes the midrange, lacks bottom, dull (Olsen); Peaky top end (Rando).

Tenor Sax: True and clear (Garfinkle); Mutes the sound of the instrument (Olsen); Veiled (Sheppard); Peaky top, upper mids (Rando).

Guitar: Warm, natural, not a lot of highs (Fox); Makes the acoustic guitar sound like a K-Mart special (Olsen); Muddy, muffled (Monda); Boomy low mids (Rando).

Piano: It's definitely a piano, honest (Fox); No bottom, all top, unclear (Olsen); Honky-tonk brittle (Garfinkle); Constricted, compressed (Rando).

GROOVE TUBES MP1 (\$870)

Male Vocal: Warm, natural (Garfinkle); Good, less highs (Monda); Natural, no hype (Fox); Edgy, not smooth top (Crigger); More muted (Olsen); Tube-like, clear top end, warm mids, good low end (Rando).

Female Vocal: Some distortion (Monda); More open, less top (Paul); Cloudy low mids (Crigger); Clearer still, mid-top a bit muted (Olsen); Full, smooth, pleasant, tube-like (Rando).

Tenor Sax: Very real sound, very warm (Garfinkle); Narrower (Monda); Round-colored? (Fox); Mellow, not as real (Paul); Slightly edgy (Crigger); Open up top (Olsen); Breath, detailed, good top (Rando).

Guitar: Clear, warm (Garfinkle); Woofy,



I'd roll off lows (Fox); Better, though maybe hyped (Crigger); Better toward the live guitar sound (Olsen); Big sound, smooth but muted top (Rando). Piano: Round full, doesn't cut, best, good presence (Fox); Smearly, slushy (Paul); Very good (Crigger); Sound begins to open up (Olsen); Mushy, un-separated notes (Rando).

PEAVEY VMP-2 (\$799)

Male Vocal: Still natural, but maybe a little harsh (Garfinkle); Natural but narrow (Monda); Colored top (Fox); Stiff (Paul); Less live, still clean (Olsen); Natural, dark top end (Rando).

Female Vocal: Breaking up (Garfinkle); Good (Monda); Less definition (Fox); Constricted (Paul); Good (Crigger); Full-bodied, nice top end, fat and crisp (Rando).

Tenor Sax: Low end warm (Fox); Harshness creeping in on the edges (Olsen); Okay (Sheppard); Smooth, fat, slightly dark top (Rando).

Guitar: Muffled (Garfinkle); Less definition (Fox); Not real clear (Paul); Round, bell-like (Rando).

Piano: Warm and clear (Garfinkle); Muffled (Monda); Good lows, not tons of highs, no thanks (Fox); Closed (Paul); Slightly veiled (Crigger); Better balance (Olsen); Distant, good low end (Rando).

LANGVIN DUAL MIC PRE WITH EQ (\$1,475)

Male Vocal: Nicer sound, still mashed a little (Garfinkle); More lows still (Fox); Good, natural (Monda); More top end, brighter, cleaner (Olsen); Class A discrete-sounding, smooth vintage sound, dark top (Rando).

Female Vocal: True sound, warm (Garfinkle); Warm, with some breakup of high-mids (Fox); Natural, little distortion (Monda); Distortion (Paul); Cleanest yet, closest to what this woman's voice sounds like (Olsen); Tube-like, thin bottom (Rando).

Tenor Sax: Very true sound (Garfinkle); Flat-sounding, no hype, less top end (Fox); Best on sax so far (Paul); Quite beautiful, allows instrument to sound (Olsen); Thin, dark, no bottom, all mids (Rando).

Guitar: Not as clear (Garfinkle); Warm, lots of lows (Fox); Narrow (Monda); Best on mids so far (Paul); Closest to live sound (Olsen); Round, dark top, good low end (Rando).

Piano: Cleanest and most natural (Garfinkle); Pleasant classical sound (Fox); Tubby (Monda); Muffled (Crigger); My favorite so far, bright (Olsen);

Mushy, un-separated notes (Rando).

MARTECH (ABOUT \$2,200)

Male Vocal: Very natural (Garfinkle); Less definition than #1 [Audio Upgrades], but nice (Fox); Smooth (Crigger); Close to #1 [Audio Upgrades] (Olsen); Nice top end, full mids (Rando).

Female Vocal: Something's funny in the top end (Fox); Good (Monda); Thin (Paul); Warmer than #1 [Audio Upgrades] (Crigger); Top is an ugly thing (Olsen); Like #1 [Audio Upgrades] but less real (Rando).

Tenor Sax: Bright, good definition (Fox); Edgy and brittle (Paul); Top end continues to bother me, it's harsh-sounding (Olsen); Very good (Sheppard); Thin bottom (Rando).

Guitar: Colored somewhat (Fox); Good presence, not real clear (Paul); Very good (Crigger); Brighter still, lacks bottom (Olsen); Plain, dark top and bottom (Rando).

Piano: Not so much presence, Not bad, but not great (Fox); Roomy, but mushy (Paul); Good, but cloudy in the highs (Crigger); Clean, but midrangey (Rando).

• • •

For more information on these preamps, see your dealer or call the manufacturers directly: Aphex 818/767-2929; dbx 801/568-7660; Groove Tubes 818/361-4500; Bellari (marketed by Rolls) 801/263-9053; Peavey 601/483-5365; Audio Upgrades 818/780-1222; Langevin (sold by Manley Labs, 909/627-4256); Martech 818/281-3555.

SPECIAL THANKS

To help me on my way to listening ecstasy, I prevailed upon three fine retailers in the Los Angeles area, Dalton of Project One, Peter at Nadine's Music, and Bruce of Coast Recording Equipment Supply. Also, three manufacturers lent me their products directly: Groove Tubes, Audio Upgrades and Martech.

MORE TO COME

The wave of new mic preamps just keeps coming, and in the months to come we'll be looking at new models from Jensen, Night Technologies, Crookwood, ART and more. Stay tuned.—Ed. ■

Gary Woods, a composer, arranger and orchestrator who has worked on The Mod Squad, The Love Boat, and with artists ranging from Whitney Houston to Jim Nabors, serves on the board of directors of the Society of Composers and Lyricists.

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—FROM PAGE 160, TOOL CHEST

enough that they can go right into the drive rack in a utility drawer along with their chargers so you always know where they belong when not being used. As soon as someone says words like "balcony" or "delay speakers," getting them out will save hand-waving, second-guessing, and just might make it sound better in the cheap seats. They can also be rented.

A **MIDI control source**, a half-dozen MIDI cables and a little pre-planning can automate the resetting of all outboard effects with a touch of a button. This not only allows convenient synchronization of effects to a set list, but also provides places to quickly go for generic effects presets for, say, a ballad, an up-tempo two-step, or a 4/4 rocker. The generic settings can then be quickly modified and saved to a new location for the next time that song pops up. Some consoles, like Ramsa's SX-1, Soundcraft's K-3, and Yamaha's PM-3500 have MIDI scene change capability built in. Small appliances like the \$125 MIDI Mouse from NYC's Tech 21 gives operators of other consoles the same facility.

A **25-foot three-pair** for local TV crews at FOH. This can be anything from a few mic cables taped together in a loom, to a custom box with male XLRs mounted and a space for labels. Plugging these into a few matrix outs on the FOH console ahead of time and placing the males at the edge of the mix position allows you to simply point and grunt when the media people show up just as the band is going onstage. This way you can get them off your back and give them what they need without going too far out of your way when you're busy. Labeling each connector gives you the ability to quickly identify each circuit to either adjust it or shut it off, depending on how you have decided to assist the local crew or *Entertainment Tonight* that day. This can just be coiled up and tossed back in the dog-house each day with the other console looms.

The **IR-1 Automatic Mic Switch** from D-3 (800/701-7899) is a unique infrared proximity gate that simply plugs in between the mic and cable. Introduced two years ago, this relatively unknown product is the best unattended way to turn a vocal or announce mic on and off, over and over. It uses an adjustable infrared proximity beam, so that stepping in front of the mic turns it

HARRY McCUNE JR. 1931-1996

Harry McCune Jr., who died on April 11, 1996, at age 65, was one of the giants of the sound reinforcement industry. Renowned as a gifted and meticulous FOH mixer with superb show instincts, McCune first developed his skills working for his father's sound equipment rental company in San Francisco in the '40s and '50s. McCune's military service during the Korean conflict included training in psychological warfare, and he was reportedly involved in various Cold War intelligence gathering operations.

In the '60s McCune toured the world with Herb Alpert and the Tijuana Brass and was among the first engineers to ensure quality sound by shipping his own equipment, by air if necessary. In the days when many venues had their own "state of the art" sound equipment (and a union sound man to run it) the idea of loading in a traveling act's sound system often met considerable opposition from stagehands and house managers. McCune became adept at getting his equipment set up in the best position in previously impenetrable halls, and an enviable client list of discerning and demanding artists (including Burt Bacharach, Anthony Newley, and Barbra Streisand, to name only three) gave him the clout necessary to insist on a decent FOH mix position, even in the Las Vegas showrooms, where table space is at a premium.

Though not a designer, McCune was always on the lookout for useful technical innovations and better operating procedures. At a time when there were only a handful of pro audio manufacturers, McCune Sound's technical staff designed and built many unique and innovative systems to McCune's exacting specifications. For example, a requirement for a full-frequency loudspeaker cabinet that would fit through a standard aircraft loading door led to the development of the John Meyer-designed JM-3 speaker system. The integrated tri-amped system, first used on a long-forgotten Gene Kelly show called "Clown Around," redefined industry standards for compact P.A. systems in the early '70s and came to dominate the emerging field of amplified musical theater (*Beatlemania*, *Evita*, etc.). Spurred by McCune's perfec-



tionism, McCune Sound not only pioneered many technologies and industry practices—bi-amped monitor speakers; linkable, multiple-output-bus mix consoles; standardized splitter snakes; and twist-lock speaker connectors, for example—but also provided a comprehensive and often challenging training ground for a "Who's Who" of sound reinforcement professionals. At least two major loudspeaker companies were founded by former McCune Sound employees and many in the industry have been deeply influenced by exposure to the show production methods and techniques that McCune pioneered. A long-standing member of the AES, he was personally responsible for managing audiovisual production at the 1994 AES convention in San Francisco.

A complex and often inscrutable personality, McCune was a master at solving the sound-related problems often associated with sensitive artists and high-profile events. Several clients relied on him to the point that they would schedule performances only when McCune was available to mix. Those who worked for McCune generally agree that he was among the finest FOH mixers, with an uncanny ability to hit every cue, no matter how complex the show or unfavorable the circumstances. He insisted on the highest standards of performance from both equipment and crew and his attention to detail and uncompromising standards were legendary—he even toured with a full-size EMT plate on occasion. McCune was not only a master of his craft but was also a driving force at pivotal moments in the development of concert sound technology; his influence will be felt long after his passing. —Chris Michie

on and stepping away turns it off. When used for vocal mics in front of high-SPL back-line amps, it provides hands-free gating that doesn't suffer from false triggers, and allows the engineer to concentrate on mixing. Used for the emcee's announce mic, it allows the FOH engineer to concentrate on more pressing issues, like the opening act's percussion and horn players that just showed up and aren't on the stage plot.

Headphone amps, like Shure's FP-22 and Whirlwind's new "Brick," are battery-powered field production devices that can be used to trouble-shoot a wide variety of situations. These allow a technician to easily move through a signal chain with a pair of headphones and track down the exact point of failure. Another little known use is to simply plug in a sensitive dynamic mic and walk around the stage listening. You'll be surprised at the ability to hear RF-interference hot spots onstage in high-interference locales.

Isolation transformers can be an invaluable tool when interfacing touring rigs and permanent systems. Many companies build their own from Bud-boxes and Jensen transformers, but they can be bought from various manufacturers, like Whirlwind's Line Balance/Splitter, which provides both a direct and an isolated output. An AC isolation transformer, down at the Cam-lock end of the sound system, can be a boon in reducing the effects of marginal electrical service on your show. These are rather expensive, heavy and, yes, your sound system will actually work without one, albeit with the occasional buzz. However, their ability to put you in your own private Idaho, electrically speaking, means the end of dirty neutrals forever. The ability to re-tap to a slightly higher voltage will ensure that all the digital devices still work when there's only 103 volts at the new casino or shed in Podunkville. These are expensive, but can also be rented.

Carry an **SPL meter** with you. Sounds louder than 90 dB SPL eventually cause hearing loss, given enough exposure time. If you're working on a regular basis with any loud acts, you must eventually acknowledge the long-term effects of what your ears are being subjected to. If you're mixing, it only makes sense that you should keep track of your levels. A Radio Shack SPL meter (priced from \$31.99) is inexpensive, but it implies a professional awareness. You don't need to live by any hard and fast SPL rules, but the ability to track levels over the course of your show offers an

advantage in dealing with individuals who are more concerned with it than you are. Even people who drive fast look at the speedometer occasionally.

Foam **Ear Plugs** from manufacturers like Cabot (EAR®) or Moldex (Spark-Plugs®) can be purchased in bulk at fire and safety supply houses in major metropolitan areas for \$20-\$30 for a box of 200 pairs. They provide 30 dB of attenuation that, although not flat, is fine for noncritical listening. Wear them on the tour bus when you're sleeping or on airplane trips. Noise levels in bus bunks and coach class may exceed the daily dose of OSHA SPL exposure—*before* you even get to the venue! Remember that exposure while you're sleeping also counts.

Electrical tape in several colors for giving the console and other pieces of sound equipment meaningful labels is helpful, but when is the last time you found more than masking tape or even two colors in the work box at FOH? Like anything that gives you an edge for a couple of bucks, buy yourself a PVC rainbow and carry it along with your collection of Sharpies.

A tiny **Excelite™ screwdriver** ("greenie") can be extremely handy to carry around. Taping it onto a lanyard means it's always handy for tightening up those pesky XLR connectors that rattle loose on the snake fan-out and mic cables.

Pin-one-lift XLR barrels are great for trouble shooting when interconnecting equipment from different sub-systems. These can also be manufactured on-the-spot by opening a mic cable (using that "greenie" again) and clipping pin 1, but be sure to label this with brightly colored electrical tape to help you find it again and to warn others; also, this is one mic cable that will no longer pass phantom.

Telephone-style handsets for use with comm systems alleviate the need to rip one pair of headphones off and shove on another in a crisis. They make it easy to cue up problems in one ear while discussing them in the other. There is also no need to turn off the mic on the comm station because of the momentary switch in the handle.

A good mic with a switch is something that can be special-ordered from most manufacturers. Not only useful for checking the P.A. and tweaking effects, a switched mic is indispensable for talk-back as it leaves your monitor engineer without an excuse for not leaving the TB turned on all the time. As a monitor engineer, a switched mic lets you instantly respond to questions onstage

with one hand while making adjustments with the other. A cheaper alternative is Switchcraft's T3F female XLR, which incorporates a switch into the barrel of the connector, but it may take others a little longer to figure out, and the switch doesn't stay with the mic, meaning you must keep track of the cable.

A small powered speaker at each console, connected by a snake line to a switched mic at the other console, makes a great headset-free communications system. Powered speakers can be used instead of headphones by plugging the console's control room output into the speaker's line input. Some consoles have rarely-used comm features that are more useful when used with a speaker than with headphones. Patching a delay between the console and speaker allows you to sync it to the arrival time of the sound from the stage, making it more accurate for you and easier for others nearby to listen to while there's music coming from the stage.

Music. Several well-chosen recordings for assessing and tuning up sound systems are invaluable. Try to pick titles that you are both familiar with and can easily replace when they get misplaced or left behind in someone else's machine. Three useful titles will allow you to always have something appropriate to play on the P.A.: Top 40, male vocal; Top 40, female vocal; and adult contemporary, no vocal. When record company reps come to your show, hide everything in your collection by their label, and then show them what you have while complaining about needing something new to play at gigs.

It can be very handy to have your favorite half-dozen songs for tuning up the P.A. prerecorded on DAT in the order you like them. When touring as the artist's engineer, you can then fill the rest of the DAT with a standard walk-in music recording that you start when doors open so that you'll always have a feel for how close to the top of the show you are. Also very handy for driving the rest of the crew nuts on those long summer tour legs by using day in and out. Carry a couple of back-up copies of this DAT in case it suddenly disappears a couple of weeks into the tour. Same goes for those smelly tennis shoes you wear every day and leave in the back lounge of the tour bus. ■

Mark Frink, who just bought a new pair of Nikes, lives in Portland, Oregon, and can be reached at 503/223-2345.

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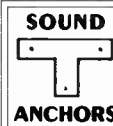
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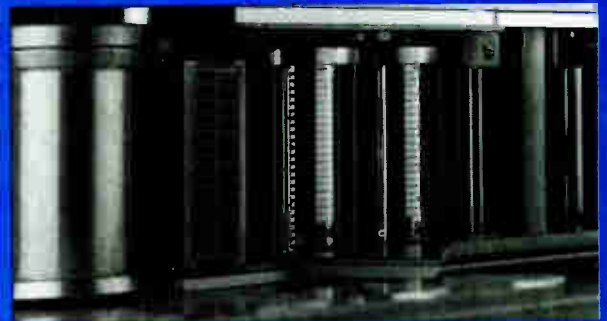
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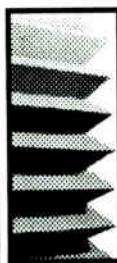
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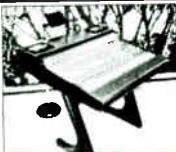
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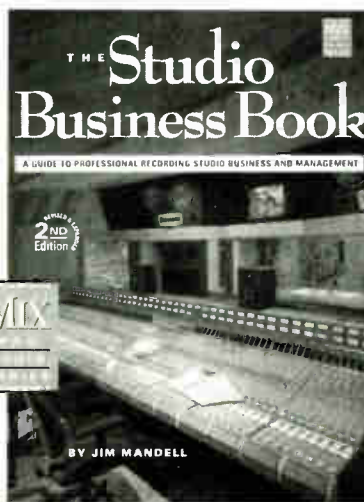
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—FROM PAGE 132, KEITH STEGALL

album was his toughest project to date. "Alan teases me about this because he thinks I worry too much about it," he laughs, "but we had some tuning problems in the piano and I had to go back and replace a lot of piano and bass. Thank God (bassist) Glenn Worf and Pig Robbins were patient with me. Sometimes when you get into a trench with some of this stuff, it gets worse, or you think it is because you start picking things apart. I probably scoped that record to death and worried myself silly about it." Ironically, that has been Jackson's biggest seller, thus far exceeding 600,000 copies.

A big concern in Nashville is how crowded the country music scene has become, which makes one wonder why it is that one song or artist makes it to radio while another doesn't. "When I'm producing a new artist who is a writer," Stegall says, "I look for those songs they've written that I think people and radio will like. As a rule, it's the songs first. Then it's making sure the performance is honest and true, and third is putting it sonically all together and just hoping by the grace of God that we'll get lucky enough to get on the radio.

"I try not to follow trends too much because usually if you're following a trend, you're on the back end of something. I feel like with Alan's records, we've been on the front end of things, which goes back to letting the artists be themselves. Don't get me wrong, you've got to make records for the masses, but you also run the risk of making cookie-cutter records if you're not careful. Again, that boils down to songs."

Stegall concedes that one great difficulty Nashville producers face these days is creating a unique identity for an artist. "You have to be there to make sure the artist is guided and to hear what the artist has to say about their music," he says. "A lot of times the strength comes from where the artist is in their head about what they're doing. An artist who comes to me and says, 'Do something with me,' is too hard. I want to see somebody who says, 'I know who I am, I know the kind of songs I want to sing, this is what I am about, do you want to make a record with me?'"

"Terri Clark is a classic example of that," says Stegall of the singer who made a big impact last year. "She knows exactly who she is, and I imme-

diately knew she was different. She had an edge to her personality and her music, she was confident—not cocky—and she sounded different. It was obvious to me that we could make some really cool records with her. If someone doesn't sound different from someone else, we're in trouble from the get-go. I take my cue from the vocalist. Does this artist have something unique in their voice that compels you to listen to them? Then making a record around that is a piece of cake." Stegall says an old Kelton-owned U87 Neumann mic has a lot to do with Jackson's sound.

Stegall also uses specific instrumen-

fort zone that helps when you've got that. Glenn Worf is a great bass player, and we've all gotten to be buddies. There's no ego in the room, nobody trying to outdo anybody. It's just fun.

"When we're running songs down," Stegall continues, "I'll let the section have their way with it for a while because I know if you immediately start telling somebody how to do something, it takes away their creative prowess. After 15 or 20 minutes, I step in and guide them where I want to go with the music. I know a lot of people say, 'Here's what I want you to do,' before the guys ever sit down. I think sometimes you can really rob a track

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tation to help define an artist's sound. "The players most apt to change in my rhythm section are keyboard and acoustic guitar," he says. "Those two instruments can change the texture and sound of a record quite a bit. On Alan, I use somebody traditional like Pig Robbins. On Terri Clark's album, we used Matt Rollings, who comes from a different place. Bruce Watkins plays acoustic guitar on Alan's records because he plays a lot of the older, traditional 'ching ching' guitars that were on the Nashville records in the '60s, but on somebody else's record, I'll use somebody like John Willis who has a more James Taylor-ish approach to music, picking-wise. Those colors can change it. The mainstays for me are usually drums—Eddie Bayers plays on almost everything I do, although I used Kenny Aronoff on my stuff because I felt I could experiment more on my music and get away with it," he says, referring to his own recent autobiographical project, *Passages*. "Paul Franklin is a great steel player, and we have a great communication level. Brent Mason is a dear, dear friend of mine and there's a com-

of its spontaneity and character by doing that. Sometimes I hear records finished in my head, but when I give people the space to do it, it comes out even better than what I heard in my head."

Because Stegall's production philosophy has been strongly influenced by having been on both sides of the glass, the musicians in town enjoy working with him. Many of his other associates, however, aren't so sure what to make of a man who is a successful songwriter, artist, producer and now Mercury's division chief. "People do multiple things in the pop world. I always think about Babyface who's running a record company, is an artist, a writer and producer. I think in Nashville it's just not done, so people look at it a little strangely—they wonder if I can do any of it well. I guess the solution to that is that I just do it and hope I have enough success with it that people will let me do my thing, and I'll be a happy guy." ■

Robyn Flans is a freelance writer based in Southern California.

FEEDBACK

CAUGHT IN THE WORLD WIDE WEB

Recently, I spent a couple of hours browsing the Web, looking for home pages that contained audio samples. My thought was that I would learn more about the new file formats and get a better feel for how real-time audio runs on the super highway. My first stop? Real Audio.

To play these types of audio files, you must have minimum requirements in hardware. No problem, the station that I was on met minimum standards. Next you have to download the play software. That sounded reasonable enough to me. Twenty-five minutes later, I got that done. Can I go play yet? No! You must fill out the information screen describing your system. Okay. What next? Back to the browser.

With liver-spotted fingers from all the previous waiting, I re-entered the Web browser and called up the Real Audio home page. As winter slowly changed to spring, I began to notice a blurry image taking shape on the screen. I made it! My enthusiasm soon turned to apathy, however, as this graphic image turned out to be nothing more than tasteless eye candy that did nothing. I clicked on it vigorously in spite of myself, in hopes that it may make a sound. Nothing. At this point, I figured I would cut my losses before I cut my own throat and tried another page: MTV. Here we go...Click...Wow, nice looking page. Loaded up real fast, too. Lots to click on. Hmm...Videos, videos, videos, more funny little pictures, and my speakers are still silent. Let's try this...Click..."Select file to save to." I don't want to save anything! I want some audio! I turn to the head of our graphics department and say, "Hey, Doug, What the hell is with this thing?" Doug says, "Well, Bob, there is no instant gratification on the Web." Sure there is, I could smash the monitor with this tape dispenser, and I'm gonna feel much better.

With all this technology, there is no interest in giving someone a sound bite that does not accompany some pixilated fluff that takes a lifetime to render. Is this a medium that I want to contribute to? If I were one of my present clients

looking for information on audio production and interested in hearing a quick sample or blurb or even a single note of music, I would have disconnected my modem and dialed the phone myself in the first ten minutes.

Two hours later, I am still interested in making fast and simple audio available on our company home page. Something easy to get at. Click here...get some sound, on any platform. Well, what are the answers? .AIFF? .WAV? Real Audio? I still don't know. I don't even know if I want to know anymore. I did realize one thing, though. The Web is for spiders. Any of you tasty moths out there looking for audio production can call me direct, and I'll FedEx you a tape.

*Robert Pascarella
Sound Designer/Composer
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FIRE CODES AND FOAM

The question of what type of fire rating applies to surface-applied acoustical foam comes to RPG's attention frequently. We decided to help clarify what users need to be concerned with, from a legal aspect and most importantly with respect to life safety.

Acoustic foam typically falls under what the National Fire Protection Agency (NFPA) refers to as an Interior Finish. Interior Finishes include wall, ceiling and floor interior finishes as described in Section 6-5 of the Life Safety Code. The Life Safety Code, which was adopted by the NFPA, is a guide referred to by most other building codes used throughout the United States.

For any building material to be considered for inclusion into a design as an interior finish treatment, it must first be treated according to the American Society for Testing and Materials (ASTM) test E 84, "Test Method for Surface Burning Characteristics of Building Materials." (The NFPA also uses the same test, which is referred to as NFPA 255.) From this test, data are collected for flame spread and smoke developed. Depending on these values, the material will be classified as Class A, Class B or Class C.

Manufacturers make various claims

and statements regarding the fire ratings of their products, but the only applicable fire rating for these types of products as an interior finish is as described above. Class I or Class II ratings apply to interior finishes and are not applicable to interior wall or ceiling treatment. A "1 Hour" or "2 Hour" rating refers to ASTM test E 119 (NFPA 225), "Method for Fire Test of Building Construction and Materials," which is specific to certain wall structures/partitions and, again, does not apply to interior finish treatments. Underwriters Laboratory (UL) ratings, while applicable to certain ceiling systems and electrical fixtures, do not apply to building materials intended for this type of use. ASTM E 84 values are the only ones that are applicable for determining the suitability of a material as an interior finish treatment.

The Life Safety Code specifically refers to cellular or foamed plastic materials and excludes them from use as an interior wall and ceiling finish, with two exceptions. One, the material may be permitted on the basis of fire tests that substantiate their combustibility characteristics for intended use. Second, the material may be permitted for trim not in excess of 10% of the entire wall and ceiling area, if it is not less than 20 pounds-per-cubic-foot density, is limited to ½-inch in thickness and four inches in width, and complies with the flame spread for Class A or B but not the smoke developed. Obviously, the size restrictions alone would preclude a non-rated material from being as effective as an acoustical treatment.

RPG Diffusor Systems Inc. made the decision early on that in order to fully comply with any local, state or federal authorities having jurisdiction over these matters, all RPG products will carry a Class A rating.


*Dr. Peter D'Antonio
President/CEO
RPG Diffusor Systems Inc.*


Send Feedback to Mix, 6400 Hollis St. #12, Emeryville, CA 94608; fax (510) 653-5142; or 74673.3672@compuserve.com

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 Studio-grade mic preamps with discrete circuitry for high headroom low noise (-129.5 dBm E.I.N.) and wide frequency response (over 300kHz).

 Low Cut filters (18dB/oct. @75Hz) on mono mic/line channels allow use of low-frequency EQ on vocals without boosting room rumble, mic thumps, P-pops and wind noise.

Trim Controls on mono channels have 60dB total gain range for boosting weak sound sources and a 10dB "virtual pad" for taming hot digital multitrack outputs.


2 Aux Sends per channel (one globally switchable pre/post, one post-fader), each with 15dB of gain above Unity to boost weak effects.

 3-band equalization with 12kHz High shelving EQ, broadband musical 2.5kHz peaking Midrange & 80Hz Low shelving EQ.

Constant loudness pan controls.

Stereo in-place Solo.  Mute button routes signal to "bonus" Alt 3-4 stereo bus outputs & Control Room matrix. Handy for both recording and live applications.

 **MS1402-VLZ ONLY:** 60mm logarithmic-taper faders based on our exclusive B-Bus design. Long-wearing wiper material and tight polymer lip seals to protect against dust & other crud.

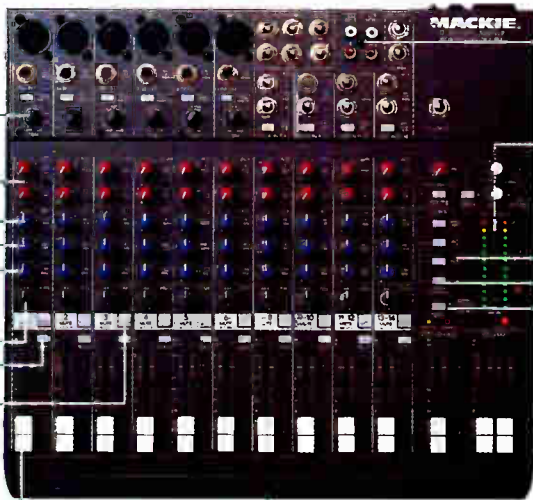
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Phantom power so you can use high quality condenser microphones. XLR outputs with mic-line level switch (along with 1/4" TRS outputs on top panel).

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 All inputs & outputs are balanced¹ to cut hum & allow extra-long cable runs, but can also be used with unbalanced electronics. ¹except RCA tape jacks, headphone jack & inserts.


 VLZ (Very Low Impedance) circuitry first developed for our B-Bus console series dramatically reduces thermal noise & crosstalk in critical areas.




Control Room outputs feed monitor speakers without tying up the headphone jack.

BOTH MODELS HAVE:


 Radio Frequency Interference protection via metal jacks & washers plus internal shunting capacitors.

 High-output headphone amp can drive virtually any set of phones to levels even a drummer can appreciate.

Aux 1 Master level control & pre/post switch.

 Effects Return to Monitor switch folds Aux Return 1 effects into a stage monitor mix via Aux Return 2 level control. RCA-type tape inputs & outputs.

Peak-reading LED meters with Level Set LED combined with In-Place Solo allows fast, accurate setting of channel operating levels for maximum headroom and lowest noise floor.

 Control Room/Phones Matrix adds monitoring, mixdown & metering flexibility. Select any combination of Main Mix, Tape In and Alt 3-4 signals for routing to phones, Control Room outputs and meters. Can be used as extra monitor or headphone mix, tape monitor, or separate submix. Way cool.

Tape Assign To Main Mix assigns unbalanced RCA tape inputs to main mix. Besides its obvious use as a tape monitor, it can also add an extra stereo tape or CD feed into a mix or play music during a break. **MS1402-VLZ only:** Global Solo Mode selects PFL or AFL solo modes.


Solid steel chassis & thick fiberglass internal circuit boards resist abuse. Channel inserts on mono channels.

Not every production project requires dozens of input channels and boatloads of buses.

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Our MicroSeries 1202-VLZ and 1402-VLZ might have small footprints, but when it comes to performance, they walk very tall.

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