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- The Industry At a Crossroads
- Producer Brian Ahern

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can accommodate either 0.775, 1.0, or 1.5 volt drive levels with no performance sacrifice. ■ The LIMPET's universal power supply, equipped with an industry standard IEC connector easily deals with almost any voltage, making the LIMPET a true global traveler. Finally, you can take your monitors wherever your work takes you, and not have to worry about cumbersome and troublesome adaptors, power converters, or strange electrical systems. ■ In addition, the unique and proprietary soft-clip circuitry and the significant reserves in the power supply ensure that no damage will occur to the drive units while providing the headroom needed for even the most demanding requirements. ■ The LIMPET is ideal for professional recording, broadcast/post production facilities, remote and live recording reinforcement applications, and finally gives the private/home recording studio truly reference quality performance unequaled at twice the price.

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BELIEVE

■ Instead of settling for the ordinary, get a LIMPET and get a real grip on your reference monitor performance.

MIX®

PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

AUDIO

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POST-PRODUCTION

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DEPARTMENTS

Cover: Designed by studio owner Simon Andrews and producer/engineer Frank Filipetti, with technical installation by chief engineer John Herman, Right Track Recording's Studio B in New York City incorporates a 96-channel AMS Neve Capricorn digital console with Sony PCM-9000 magneto-optical 2-track and Studer D827 digital multitrack, yielding 24-bit audio from recording to mixing. With Gene ec 1034As for the mains and JBL 8330s handling the stereo surrounds, Right Track Studio B aims to set a new precedent in true 24-bit audio production.
Photo: Michael Partenio.
Inset Photo: Ron Batzdorff, courtesy Warner Bros./Universal

FROM THE EDITOR

CONSOLE ELATION

Buying a console isn't much different from buying a car. What everybody really wants is a 180-mph sports sedan that seats 12 and has off-road handling, a luxury ride and the cargo capacity of a B-29 bomber, yet is compact enough to squeeze into a Greenwich Village parking space on a Saturday night. Pricing should be at least 50% below the competition, with a 2.8%, 72-month, guaranteed-buyback lease. That's the car for me, but unfortunately it doesn't exist. By the same token, neither does the "ideal" console.

A recording console is the single most expensive purchase a studio will make, and the decision is extremely difficult for a facility owner. Follow the supposedly "safe" route of buying what everybody else is buying, and your studio may become another "me-too" room.

Even the simplest of questions aren't so simple: Do you buy an analog desk or one of the new digital wonders? Technology seems to be changing at a dizzying pace, yet reports from manufacturers indicate steady sales of high-end analog consoles. The bottom line, of course, is determining what you—and/or your clients—require and are willing to spend.

Maintaining the current state of the art may be the edge you need to attract business. At the same time, purchasers of absolute leading-edge technologies may find themselves reluctant beta testers for an unending slew of software fixes. The hardware situation is also tenuous: Will the 16-bit design of a few years back be competitive in the 20/24-bit world? And now that we've all become used to mixing in LCRS, how will our current (or future) console handle new 5.1 and 7.1 release formats, whether they be DVD, DTS, Dolby Digital or SDDS?

In the "good old days"—whenever they were—finding the "right" console size required adding the number of channels on your multitrack and throwing in a couple of extra for outboard gear. Now, as studios combine standard multitracking with virtual tracking, MIDI sources, MDMs and dozens of signal processors, such guidelines for determining console requirements are useless.

To make the new console selection process easier, this issue includes a report on the state of the art, with information on dozens of 24/48-bus consoles from 25 manufacturers. Unfortunately, it doesn't include any 12-seat highway cruisers, but with the wide range of mixers presented in the article, you may just find something that will do 48 tracks on the quarter mile in 6.2 seconds. Toss in plasma metering, moving faders and a tuck-and-roll Corinthian leather armrest, and you'll have something even Stephen St.Croix would love.

Rev it up!

George Petersen

George Petersen

KRK: Up Close

RoK·Bottom

The perfect addition for anyone requiring better low-end response in a near-field monitoring application, the RoK·Bottom kicks some serious butt. The sub-woofer utilizes a unique enclosure shape similar to the popular K·RoK, minimizing parallel walls to maximize low-end punch. The 2.1 cubic enclosure features a 12-inch long-stroke polyglass woofer with a metric sensitivity of 91 dB and is available in non-powered and 140 watt powered versions with an LCR summing amp and an internal crossover.

NEW

K·RoK

The K·RoK personal monitor, featuring radical new designs in driver and enclosure technology, has developed into one the most popular near-field monitors on the market. The unique cabinet shape, which minimizes parallel walls, was designed to optimize linearity and maximize low-end punch. This provides extremely accurate reproduction of instruments and vocals. Perfect for all near-field applications, the K·RoKs not only out perform the competition, they also represent an incredible value at $495.00 per pair.

NEW

POWER BLoK

The 140-watt KRK POWER BLoK represents a revolutionary concept in near-field monitor amplification. Offering a cost-effective alternative to conventional rack-mount amplifiers, the class A POWER BLoK is available as an internal option to all KRK monitors, including the RoK·Bottom sub-woofer, or may be purchased separately and used as an outboard amplifier. The proprietary power module features regulated power supplies to all voltage gain stages and heavy duty Neutrik combo connectors as well as extensive DC protection circuitry. Distortion is less than 0.05% at 140 watts, while noise (A weighted) is specified at -100 dB EIN input open.
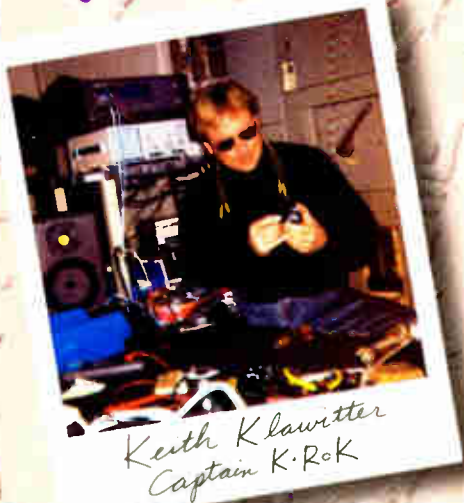
Keith Klawitter
Captain K·RoK

Chris Fichera
with KRK mascot, "Pinky"

Keith Klawitter,

KRK Systems, Inc. president and chief design engineer, started the company in 1986. Previously, Keith had worked as an independent recording engineer at many of the world's major recording and film studios and has gained numerous film credits with projects at Metro/Goldwyn, Paramount, MGM and Universal. KRK's phenomenal success can be attributed to a unique combination of exotic driver materials, proprietary crossover, stylized cabinet design and Keith's vision of uncompromising sonic quality.

Chris Fichera,

vice president, Group One Ltd., exclusive distributor of KRK Systems products worldwide, has gained international recognition as both a Grammy Award winning engineer and industry marketing veteran. "We have intentionally limited KRK distribution," says Fichera. "KRK dealers were selected on their ability to effectively serve the professional audio market with product knowledge and a thorough understanding of the recording process."

CURRENT

DOLBY, MICROSOFT ALLIANCE

Dolby Laboratories in San Francisco is heading up an industrywide venture to develop high-quality audio for multimedia and PC platforms, including surround sound applications. As part of the effort, Dolby has enlisted more than 50 IC and software allies, including Intel, Motorola and Microsoft.

In a related move, Dolby and Microsoft announced an agreement to jointly develop technologies and specifications to support the use of Dolby Pro Logic and Dolby Digital for PC and multimedia applications. "Bringing the PC to the home entertainment center requires giving it the best possible audio abilities," says Carl Stork, director of Windows platforms at Microsoft. "With the support of Dolby, we're working to make that happen."

HARMAN MAKES MOVE TO NASHVILLE

In an effort to focus its U.S. sales operations and realign its North American distribution business, Harman Pro North America will relocate to Nashville and will distribute four major European brands: AKG, BSS, Soundcraft and Studer. According to Harman, the consolidation will enable the group to be more responsive to the needs of the U.S. market, and the move to Nashville will bring practical benefits, such as a central location, growing local economy and local music culture. The new operation, scheduled to open in September, will be headed by controller Mark Leveridge.

MICHAEL GERZON, 1945-1996

Michael Gerzon passed away on May 6. His 121 published papers cover a wide variety of subjects—most, but not all, concerned with audio—and his contribution to the art and science of recording and reproduction was truly innovative.

To some, Michael's name brings to mind his work on digital audio. Others may recall his contributions to quantum theory, or know his brilliant live recordings of jazz, classical and improvisational rock music. For me, his name evokes the person, the many years of hard work

on psychoacoustics and, of course, Ambisonics.

I first met Michael in London in the early '70s. Later, a colleague and I visited him in his tiny Oxford flat to discuss surround sound. He pointed to a volume on relativity and told us it held the key to surround sound recording—he was, of course, correct.

As part of the Ambisonics team, he did the vast majority of the original theoretical work and much of the practical. He was awarded an AES Fellowship in 1978 for his work on psychoacoustics and was responsible for the theory behind the Soundfield microphone. While many wished to use Ambisonics for capturing live performances and re-creating them in the living room in three dimensions with just four channels, we wanted to use the technology for multitrack recording and mixing. We were not surprised to find that Michael had already designed the basic circuits for Ambisonics panpots and mixers; all we had to do was build them. Eventually, thanks to Dr. Geoff Barton and Audio & Design Recording, I had real studio systems to work with, and I have recorded four dozen albums using the technology Michael had pioneered.

Michael worked in other aspects of audio, but the delivery of meaningful spatial information always seemed to be a part of his research, whether it was Waves' TrueVerb or Stereo Imager, his proposals for multichannel stereo for HDTV, or his contributions to the High Quality Audio Disc proposal issued by the Acoustic Renaissance in Audio group. Michael's work on Ambisonics won him the AES Award of Excellence in 1992. Hopefully, we will be using it on tomorrow's multichannel digital discs.

Michael Gerzon was a giant in the field of audio. His work at Ambisonics built on the pioneering discoveries of Alan Dower Blumlein, Britain's earlier

audio genius who developed many of the basic principles of stereo. It is fitting to both men to mention them in the same breath. Michael's work was astonishing, yet so was he as a person. Despite his continual problems with severe asthma, he remained lively about his research and recordings and maintained an excellent sense of humor. He was a man of immense creativity and integrity in a world that didn't always appreciate it. We owe it to Michael Gerzon to ensure that he is not forgotten.

—Richard Elen

SPARS 1996 CONFERENCE

The Society of Professional Audio Recording Services hosted a weekend industry conference to discuss expansion of business through technology. The seminar took place in Los Angeles from May 17-19 and brought together 150 representatives from leading manufacturers. Featured at the event were panel and group discussions, along with lectures from such speakers as Rupert Neve and Russ Berger.

The goal of the conference was to promote development strategies for success in the 21st century, says SPARS president John Fry. "Previous conferences have focused on digital audio workstations and have been largely oriented toward the demonstration of equipment," says Fry. "This years's conference was information-oriented, with an emphasis on the implications of new technologies." SPARS plans to host a similar conference next year.

MIX AES NEW PRODUCTS GUIDE

The November issue of Mix will include our annual AES New Products Guide. Forms are being mailed to manufacturers this month and must be returned before August 1. The Guide will spotlight new, AES-debuted products. If you want to submit a product description but have not received an official form by July 20, please call Barbara Schultz: 510/653-3307.

TC ELECTRONIC TO DISTRIBUTE TUBE TECH

Tube Tech, based in VanLose, Den-

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http://www.mixmag.com

Introducing...

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Neumann understands tube microphones. We've been making them since 1928. The U 47, M 49, U 67, and KM 53 are legendary – coveted by engineers and producers worldwide. When asked to reproduce a microphone with the 'classic' characteristics of our older jems, we decided to go one better. Enter the new M 149 Tube. Utilizing the K 49 capsule and headgrill from the classic M 49, coupled with the transformerless FET 100 circuitry from our TLM 50, the M 149 Tube is a modern microphone in the classic Neumann tradition.

The M 149 Tube features 9 polar patterns and a 9-position high-pass filter. With a self noise of 11 dB-A, the M 149 Tube is the quietest tube microphone in the world. The tube and associated circuitry for the M 149 Tube are mounted on modular 'circuit cards.' In the future, a variety of tube modules will be offered, allowing you to customize your M 149... different tubes for different recording situations.

Neumann has brought more than 50 years of design expertise to the M 149 Tube, and it shows in every detail of this truly outstanding microphone.

Neumann... the choice of those who can hear the difference.

The M 149 Tube

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World Wide Web: http://www.neumann.com

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INDUSTRY NOTES

Mark IV Audio North America in Buchanan, MI, appointed Monte Wise to the newly created position of national sales manager of pro sound fixed installation/cinema... Yamaha Corporation of America (Buena Park, CA) announced the formation of a dedicated commercial audio sales force, headed by national sales manager Rick Young... Audio-Technica in Stow, OH, promoted Philip J. Cajka to president and CEO and Kenneth R. Reichel to executive vice president and COO...Netcast Communications Corp. (New York City) formed a partnership with AT&T (Greensboro, NC) to deliver high-quality audio over the Internet...Jack van der Dussen fills the newly created position of general manager of Quantegy Europa, headquartered in Mountain View, CA...Mackie Designs (Woodinville, WA) announced the appointment of Greg Silsby as "commercial sound guy." In other Mackie news, the company was ranked in *INC.* magazine's Top 100 list of fastest growing publicly held U.S. companies...John Lennon joins Ferrofluidics (Nashua, NH) as audio products specialist...Grass Valley, CA-based Graham Patten Systems named Sheila H. Ross as director of North American sales...Genelec moved to new offices. The address is 39 Union Ave., Sudbury, MA 01776. Phone 508/440-7520; fax 508/440-7521...Dolby Laboratories in San Francisco appointed Strassberg Associates (New York City), Dale Pro Audio (New York City), Audio Intervisual Design (West Hollywood), Cutting Edge Audio (San Francisco) and Sonotechnique PJL Inc. (Vancouver) as new dealers for its pro audio products...Digidesign relocated its headquarters to 3401-A Hillview Avenue, Palo Alto, CA 94304. Phone 415/842-7900...Sennheiser in Old Lyme, CT, hired John M. Ruffner as manager of finance and administration and John Falcone as vice president of

marketing/sales for the U.S... Howard Schwartz Recording in New York City named Fred Miller as audio director/producer and Tony Giovanniello as operations manager...Irvine, CA-based Pinnacle Micro named Lawrence Goelman to its board of directors and brought in Kenneth Campbell as executive vice president, technology and general manager...Paul Freudenberg was promoted to national sales manager at BSS Audio in Northridge, CA...Sam Ash Professional (New York City) named David Prentice as director of marketing, Chris Stubbs in parts and accessories and Dave Carlock, John Convertino, Bill Dexter and Scott Godin as new salespeople...Hickory, NC-based CommScope appointed Gepco International Inc. (Chicago) as an exclusive distributor of its audio and video broadcast cable products...Korg U.S.A. moved to 316 South Service Road, Melville, NY 11747-3201. Phone 516/333-9100; fax 516/333-9108... Joe Territo joined Apogee Sound (Petaluma, CA) as marketing communications manager...San Francisco-based Pacific Bell announced the formation of an entertainment division devoted to sales and development of voice, data and video services for the entertainment industry in California...Richard D. Erwin was named vice president of Audio Analysts U.S.A. Inc. in Colorado Springs, CO...Symetrix in Lynwood, WA, named On The Road Marketing as its sales rep of the year John Oram Professional Audio (Kent, UK) acquired the services of 2001 Music (Surrey, UK) to handle its marketing and public relations....*Mix*'s own Marketplace/Classified advertising manager, Robin Boyce, and former sound reinforcement editor David (Rudy) Trubitt will be married this fall. The couple met sharing an AES cab ride in New York a few years ago. Fate or destiny? You decide... ∎

mark, appointed TC Electronic as its North American distributor. Effective June 3, all distribution, warehousing and services for Tube Tech moved to TC Electronic's U.S. office in Westlake Village, Calif. For more information, call 805/373-1828.

NEW WEB SITES

CAIG Laboratories has a new home page that features product information, safety data sheets and frequently asked questions and answers from its customer service department. Visit http://www.caig.com.

Digidesign has a new Web site that offers 24-hour customer support, system compatibility charts and TechFlix, downloadable QuickTime movies designed to help with system configuration and troubleshooting at http://www.digidesign.com.

Klay Anderson Audio Inc. opened a new site. Located at http://www.klay.com, the site features Netscape enhanced graphics and RealAudio online. Visitors can browse product lines, rentals and new audio developments.

QSound opened a new home page at http://www.qsound.ca.

To see product specifications and applications and to take a virtual company tour, visit Quantegy's new Web site at http://www.quantegy.com.

Speck Electronics has a new Web site at http://www.speck.com/speck. The page features company and product information, and an Audio Trivia page.

EVENT UPDATE

The 6th Australian Regional Audio Engineering Society convention will take place at the World Congress Centre in Melbourne, from September 10-12. More than 50 manufacturers will exhibit, and Ray Dolby is the keynote speaker. In addition, 17 workshop topics have been announced. Call (61) 3 9682 0244 for details.

M.E.E.T., the Musical Entrepreneurs Expo and Training, is a three-day conference geared toward teaching musicians how to break into the jingle/voice-over video production and marketing areas of the entertainment industry. The seminar, sponsored by RZM Direct, will be held September 15-18 in Las Vegas. For more information, call 702/898-7070.

CORRECTION

The *Mix Master Directory* lists an incorrect fax number for Auratone Corp. The correct number is 619/296-8734. ∎
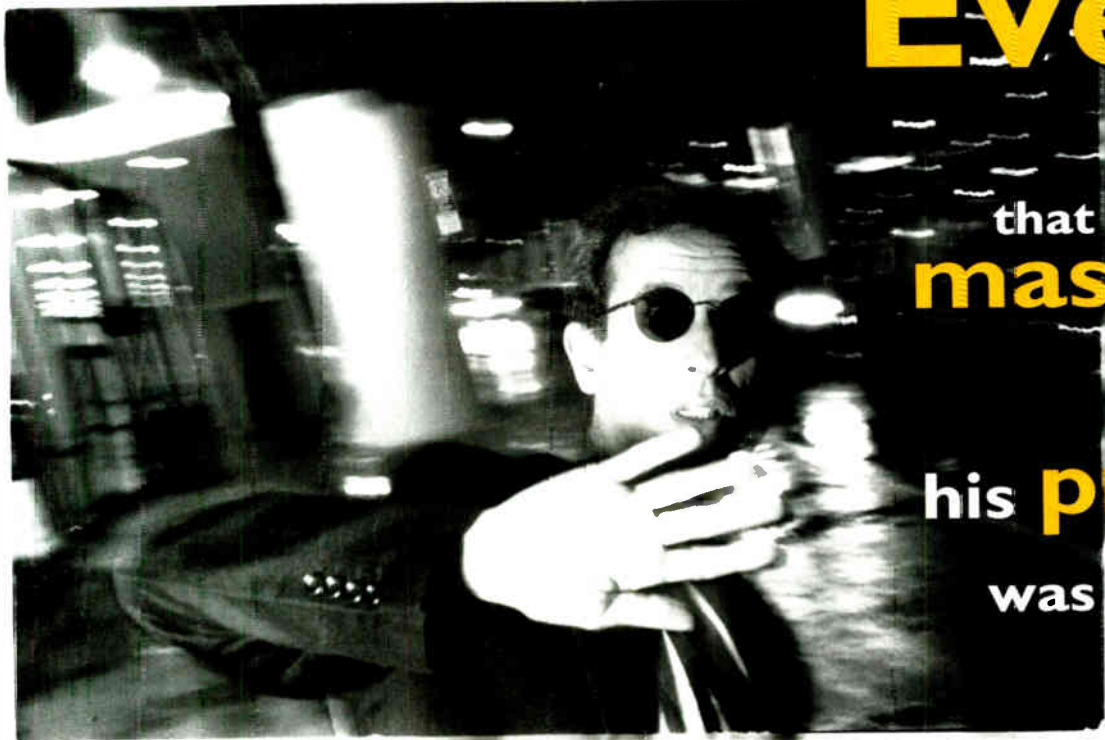
Ever since that masterful edit, his privacy was all but forgotten.

Sound designer Leslie Shatz narrowly escapes camera barrage

Producers, studios and artists are getting more attention than ever these days. Just listen to the soundtracks of Oscar nominees *Apollo 13* and *Dead Man Walking* and you'll hear incredible multitrack editing and mixing made possible only by Sonic.

Tune in to this year's Grammy-winning recordings to hear the superb sound quality delivered by Sonic Studio, the DAW that gives you the power to do your most exciting and creative work.

Sonic Studio delivers the performance and the quality you've been waiting for. Background loading, multitasking and high-speed networking turn your Sonic systems into a seamless media workgroup. Spend your time creating – not waiting.

Get your hands on the industry's favorite digital workhorse. And while you may not have to worry too much about groupies, you can expect to get chased around. By new business.

- 24 bit digital audio architecture
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- 96 I/O channel maximum
- Sub-nanosecond jitter
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Apollo 13 sound edited at Hastings Sound and Wonder Dog Music. *Dead Man Walking* sound edited at World Radio History

THE GOOD, THE BAD AND THE UGLY

A PLEA FOR ELEGANCE AND SPEED

THE GOOD

Okay, people. Gas prices are way up, and memory prices are way down; so walk to your nearest memory dealer and buy all those SIMMs or DIMMs that you have wanted for years. APS is advertising 1-gig drives for $239 and 2-gigs for $479, so you might want to pick up the phone and buy a couple o' spinners, too. Oh, yes, the JAZ is just starting to trickle out so you will need one of those... Then you will have storage and memory—you will be halfway there.

Computers are faster and cheaper, as promised by every prediction, including St.Croix's Second Law of Technology: "Whatever you have is half as fast and costs twice as much as whatever you are looking at in this month's magazines." And, for those who care, the First Law states: "Always specify FedEx overnight shipment so your gear won't be obsolete when it gets there." Okay, okay. As long as we are doing the Laws, I will give you one more, the Third. This one is long, so it is often forgotten or confused: "Always sell all of your gear at the end of every work day and buy new gear every morning." Only by doing this can you avoid the embarrassment of obsolescence and the financial drain of Explosive Value Decompression. Or you could stick your head in the sand like the government and pretend that computers have a five-year functional life—have you seen those depreciation curves?

So buy a new computer, a nice, fast, cheap thing to put all your nice new memory and drives into. Then go out and buy a new digital audio workstation, something pow-

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BY STEPHEN ST.CROIX

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erful that actually uses some modern DSP hardware in a rational way. Stick that in your computer. Track some tunes. Edit some tracks. Stretch, bend, fit, compress, morph and twist a little audio. Go back and replace the tracks you messed up when you stretched, bent, compressed, morphed and twisted them. Punch, loop, insert. Use it for a while.

Now *stop!* Take a day and compare life with a DAW to life without one—the old life, life with a multitrack recorder, a conventional analog recording desk, and a rack full of audio twisters. What got better? What got worse?

Well, it's pretty obvious what gets better when you have a *good* DAW. A good system is so fast and powerful that it takes you past its learning cycle, past the reasons you bought it (increased productivity and versatility), all the way to a

ILLUSTRATION DAVE EMBER

IN THE TIME IT TOOK TO WATCH THIS FRAME, CEDAR RESTORED THE AUDIO.
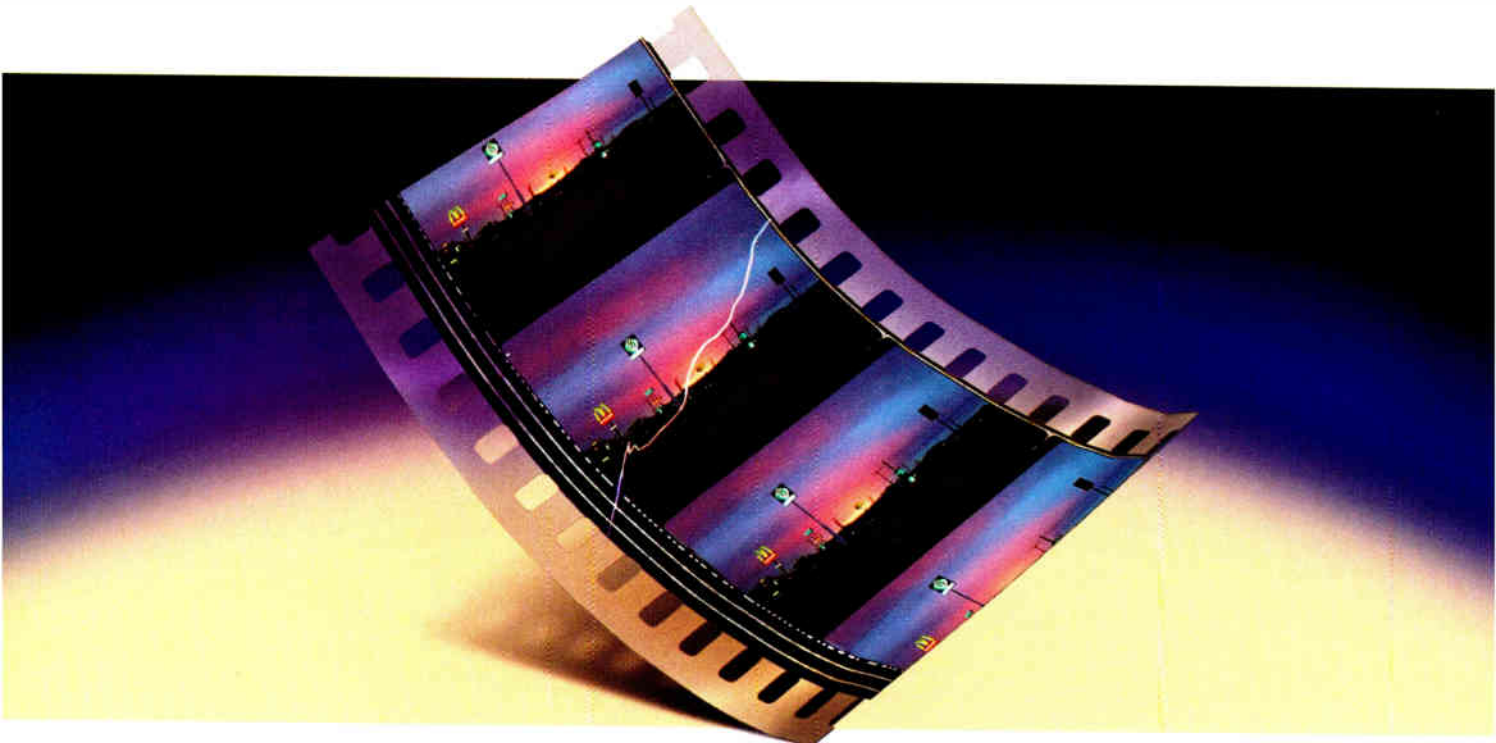
Slower solutions are never as good.

While the competition is still loading the hard disk, you can be on to your next job with CEDAR, the first – and still the only – audio restoration processors to offer mastering quality real-time scratch, click, crackle and buzz removal. CEDAR was also the first to combine unparalleled noise reduction with remarkable dynamics processing and both IIR and FIR equalisation. And then there's CEDAR's unique 'Noise Free Equalisation' which boosts the signal without re-introducing any hiss.

Not only do all CEDAR's products work in real-time, they can also be cascaded to perform all your audio restoration requirements in a single real-time pass.

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DC-1 De-Clicker

CR-1 De-Crackler

AZ-1 Azimuth Corrector

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HHb

new plane: creativity. When a system is so fast that you can afford the time to simply try out an alternate idea that is in the back of your head, and that same system is structured so that there is no

so you will end up with lots of extra bucks to buy those acoustic treatments, ancillary gear and creature comforts.

I will spare you the endless list of DAW advantages when it comes to editing, punching, locking, conforming, yada yada. I'll make it simple; DAWs

tons and big, heavy shuttle wheels are what we need for audio. So let's get them! Let's demand real DAW control surfaces, rationally designed to make DAWs at least as comfortable and efficient a work environment as the Old Way.

Next is what they sound like. This would not normally be a problem, except for the fact that the reason all of us are working today is because of what our stuff sounds like. We are all audio mixers and engineers, so I guess that little detail matters after all.

There are actually two problems here. First, the A/D and D/A conversion. Because these converters are the doorway into and back out of our wonderful new digital universe, they had better have good doors. Your choices are: 1) Find a DAW with really good converters. Oh. Well, maybe we had better go on to number 2) Get a DAW that offers various outboard converters so you may pick the one best-suited for your needs. This should happen more and more now, as DAWs grow up. Or there is always choice 3) Blow it all off and go in and out digitally. The good side here is that you have total control

St.Croix's First Law of Technology states:

"Always specify FedEx overnight shipment

so your gear won't be obsolete when it gets there."

penalty or danger in doing so (the original ideas are not erased or destructively modified), you just might try it, and maybe even several versions of it. It has been my belief for some time that DAWs will produce their own creative surge, as did Les Paul's bizarre multitrack recorder.

So more on what gets better. The DAW is quite small compared to the Old Way, so you will find yourself with lots of extra room for acoustic treatment, ancillary gear or creature comforts. And DAWs are becoming quite inexpensive compared to the Old Way,

are starting to work now. They do all this stuff much better than the Old Way ever could.

So, what's the problem? Why aren't these things the absolute, indisputable, ultimate answer?

THE BAD

There are two main real bad things about these systems. Undeniably, the first is the control surface (or lack of it)! Let's face it; mice and track balls were designed for word processing and pointing to icons or text, and graphic tablets for painting. Knobs, faders, but-

THE NEW ALCHEMISTS
SPINNING SOUND INTO MIDI AND BACK AGAIN

The hottest items at music and audio trade shows these days (besides those 48-channel automated mixers that fit in your shirt pocket) are the dog-and-pony shows in which audio recordings are amazingly turned into MIDI data and back again. A high-jumping flute passage comes out of a cello, and medieval choirs sing in be-bop harmonies. A symphony orchestra is conducted by drawing accelerandos on a screen, and The Beatles are forced into a 110bpm techno beat.

These tools are cool. You can do a lot of things with them that would have been difficult, if not impossible, before they came along. For the right people, in the right situations, they can be a real spur to creativity. So naturally, tons of manufacturers are jumping on the bandwagon, proclaiming that their conversion algorithms and DSP are faster/cleaner/better-sounding than the others. But snazzy technologies have a way of taking over people's imaginations in excess of their real worth, which makes it wise—before anyone decides to scream "Whoopee!" and base a $50-million IPO on it—to take a fairly sober look at what this stuff is for, and what it isn't.

The promise of audio-to-MIDI-to-audio conversion (how about we call it AMAC for convenience?) is that we can now dissect a recorded musical performance and isolate individual nuances, tweak them just as if they were MIDI notes and controllers, and re-apply them to the original; thus, we can

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BY PAUL D. LEHRMAN

create performances with the sonic quality of digital recordings but with a whole new level of expressive control. Computer-based composition can be liberated from the strictures of discrete synthesis and one-shot sampling, and the manipulative techniques MIDI composers know and love can be applied to any sound at all.

How true is this? Well, let's look at the process one step at a time. The first part of AMAC involves extracting performance data from an audio signal on disk. Using FFTs, spectrum analysis, weighting and other tools, the process derives initial pitch, pitch change, initial level, level change, high-frequency content and duration from the signal, translating them into, respectively, note-on, pitch-bend, velocity, volume, "brightness" and note-off

World Radio History

Now You Can See It.

Mixing Some of our competitors' disk recorders use a portion of their recording LSI to provide mix capability. While this saves money, it can also produce audio artifacts like "zipper" noise when adjusting such critical functions like EQ, pan, and fader level. On top of that, many disk recorders won't even let you make real-time adjustments during mix down, eliminating a critical part of the creative recording process. The heart of the DR mixer is a 16-channel, 24 bit custom LSI designed to provide real-time dynamic digital mix capability. Built-in 99 scene snap-shot automation for all functions and dynamic automation via external MIDI sequencers, combined with 8 or 16 channel 3-band parametric EQ option, ensures that the only limit in the DR Series mixer is your imagination. With its built-in 16 channel mixer, the DR8 becomes the perfect compliment to any 8-track recorder you might currently own. It can mix down its 8 tracks of internal digital audio with an additional 8 inputs from a sampler, tape machine, or a live performance, all in the digital domain. The MT8 mix controller provides a 16 track console format for dynamic remote control of all mix and EQ parameters.

(Monitor/Keyboard/Iomega Drive and Batteries not included.)

SuperView™ We sort of went into a frenzy packing new features into our DR8 and DR16. When we stepped back to take a look at what we'd done, we realized we crammed a whole roomful of equipment into a single 5U box. In order to help keep track of everything that's going on inside our "studio in a box", we developed the SuperView™ SVGA monitor board. SuperView™ mounts internally in the DR8 or DR16 and provides envelope and track information for up to 16 tracks of audio, as well as region highlighting for record, playback, and edit. SuperView™ is further enhanced by 16 track level meters with indicators for left/right master out and aux 1/2 out. The time indicator will read in the same format as the DR front panel. SuperView™ requires no external computer, simply plug your SVGA compatible monitor into a SuperView™ equipped DR Series recorder and you're ready to go. SuperView™ enables real-time video representation of audio status; no waiting for screen re-draws. What you hear is what you see.

Keyboard Interface To increase the power of SuperView™ even further, we added an ASCII keyboard input to the SuperView™ card, allowing a standard ASCII keyboard to operate as a control interface for SuperView™ equipped DR Series recorders. Function keys will provide the ability to zoom in on a single track, as well as zoom in/out timewise for precise edit capability. All tracks and locate points can be named, allowing you to manipulate and track large amounts of data in a very simple manner. A unique interface has been developed to allow track arming, transport control, and edit functions directly from the keyboard, providing enhanced productivity through an intuitive human interface design.

ELECTRONIC MUSICIAN
1996 EDITORS' CHOICE

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MIDI data. Brightness is not strictly defined in the MIDI spec, and there is little commonality among synthesizers as to how to interpret it, so at least for now, brightness data from this process is not all that useful. The derived MIDI data can be used to play a MIDI synthesizer in close step with the original audio, or used as a timing reference to trigger other MIDI tracks. This in itself, if done well, is worthwhile.

Turning an audio signal into MIDI data is nothing new—companies like Fairlight, IVL Technologies, DigiTech and Roland have been doing it for many years, not to mention all the hapless MIDI guitar makers who continue to bang their heads against the wall of pitch-to-MIDI conversion. This hardware's task has been to do the process in real time—that is, to extract a MIDI line from a voice or a trumpet while it's playing. The new software systems, however, do it offline, which gives them plenty of time to sift, analyze, transform and compare, so theoretically their performance should be much better. But many old problems remain: Where do you draw the line between pitch-bend and a new pitch; between a fundamental and a harmonic; between the noise at the beginning of a note and the note itself; or between voices in a chord?

Just as a hardware converter must be programmed with gate times, attack times, volume and pitch-change thresholds, etc., so that it knows what kinds of limits to set on its processing, a software converter has to be told what to do when it's confronted with ambiguous data, which, unless it's analyzing a diatonic Theremin, is just about all of the time. If the parameters are not set correctly (and sometimes even if they are), the result is a jumble of micro-notes, appogiaturas, flying pitch-bends and wrong octaves. In some ways, the software converter's job is more diffi-

Sharping a singer who sings a couple of flat notes is easy, but turning a symphony orchestra playing *Also Sprach Zarathustra* into "Mary Had a Little Lamb" is dicey.

cult. In a hardware converter designed for live performance, these minor errors fly by in an instant and are forgotten, but once they are part of a recording or a sequence, they must all be dealt with.

Of course, unless the audio is truly homophonic (that is, one instrument playing one note at a time), the output will be essentially worthless. The days when an accurate analysis of polyphonic music or chords can be made by a machine are still very far in the future. Even in the best of cases, for the resultant data to be of much use it has to be massaged carefully, with an eye toward how it's going to be used. Many of these programs include sets of algorithms optimized for different instruments and vocal ranges, but the parameters involved in setting up these algorithms are fiendishly difficult and rarely under user control. So if the material you're working with doesn't fit any of the presets, there's little you can do. And even if the "right" algorithm is there, it might not work consistently in all cases: Try a few different recordings of the Bach *Cello Suites*, or of Debussy's *Syrinx* for flute solo, or any a cappella blues or ethnic singer, and see how var-

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ied the MIDI tracks will be from each other, and from the record.

Now let's talk about the other end. This is where the jaws drop at the trade shows—when the derived data is modified in ways that only MIDI data can be, and then reapplied to the original *audio* track. Thus, instruments can be made to harmonize with themselves, flat or sharp notes can be corrected, and tracks can have their tempos changed—not just statically, but over time—or be rhythmically quantized to fit with other tracks.

The chief advantage here is not that we are now able to do time-based audio processing, which is also old hat, but that we now have a dynamic front end to do it with, one that can be manipulated in musical ways. So, to choose a simple example, instead of merely telling a horn note that we want it a minor third down, we can now tell it we want it to start a minor third down and drop another half-step over its duration. If we want to create a whole new musical phrase out of a recording, we don't have to do it in a sample editor note by note and then assemble the pieces. It can all happen in one operation.

Whether this is successful is largely dependent on the quality of the pitch- or tempo-shifting process (they are essentially the same thing, just turned upside down). Pitch-shifting an audio file isn't rocket science; actually, it's a lot harder, although mistakes aren't quite as expensive. Though great progress has been made since the first chipmunking algorithms appeared in samplers and sample-editing software, there's still a lot that can't be done. Sharping a singer who sings a couple of flat notes is easy, but turning a symphony orchestra playing *Also Sprach Zarathustra* into "Mary

Do too much to the parameters, and they will sever any relationship to the original track. Reapply them to the original, and they will be irrelevant. You'll end up with a stilted track.

Had a Little Lamb" is dicey. Any changes of more than about 7% or 8% are pretty much out of the question, and for many recordings, especially when stereo image stability or room ambience is an issue, the restrictions are much tighter. (I got an excited call not long ago from a Very Famous Conductor who had read an article of mine describing pitch and tempo shifting, and she was crestfallen to hear that she might not be able to change an adagio recording she had made into an allegro. She was even more disappointed when I told her this wasn't something she could learn to do by herself in a couple of days!)

The fact that there are dozens of pitch-shifting algorithms out there shows that engineers are still searching for this particular Holy Grail. Some of the algorithms are optimized for certain types of music, but none will do right by everything. Many of the programs let you decide what factors—pitch, timbral quality or rhythmic accuracy—the processing should favor. I've never seen any worthwhile documentation on these settings, and I don't know if that's because the manufacturers are lazy or that they figure it would be meaningless. Trial and error, for just about every type of audio

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MIX MASTERS

Tips and Techniques From Four Hot Engineers

BY MAUREEN DRONEY

When *Mix*'s editors first decided to cover mixing applications this month, they suggested discussing with engineers how they mix differently for different genres of music. But it came as no surprise that when approached with this idea, the four mixers interviewed here were a bit bemused by the concept. You see, even though they work on very different kinds of projects, the idea of mixing music generically is a foreign concept to all of them. The way they look at it, they're just mixing music—whether the song is bound for the contemporary jazz market, rock radio stations, *Billboard*'s Hot 100, or the top of the R&B charts. To these engineers (who are, by the way, all musicians in their own right) each piece of music takes its own direction, and, as they travel down that path, they use their skills to bring out the essence of a particular song, whatever that may be. That's probably

David Kahne, producer/engineer

one of the main reasons they are so successful (all of them work just about nonstop, and have done so for years). Good sports all, though, they gamely agreed to answer questions about how they use their talents to create hit mixes for various styles of music.

David Kahne is a producer/engineer who has also done time as senior VP of A&R for Columbia Records. His work in the early era of alt rock with artists like Romeo Void, Translator and Fishbone established him as a unique force in the business; he has both the rare ability to recognize talent at an early stage, and the skills to help develop that talent. Kahne's musical interests are wide-ranging—in his spare time he composes orchestral music, and he won an Album of the Year Grammy Award for producing Tony Bennett's *MTV Unplugged* in 1994. He may be best known, however, for his production work with The Bangles, including the single "Walk Like an Egyptian," and most recently, for mixing the Top Five debut release by the Presidents of the United States of America. Kahne lives and

works mainly in New York.

Don Murray has racked up ten Grammy nominations in the category Best Engineered Album, and took home a Grammy for his production of GRP Records' *GRP Superlive* recorded in Japan. He specializes in an eclectic kind of jazz that often combines master musicianship with a pop sensibility, and this work has earned him Gold records for the radio-friendly Fourplay albums, and Barry Manilow's *Singin' With the Big Bands*. Murray, himself a keyboard man, has also recorded and mixed six albums with pianist Dave Grusin, including *The Gershwin Collections*, 16 albums with guitarist Lee Ritenour, and records with Patti Austin, Dianne Shuur and many others. He has also worked on various film scores, including two that garnered Academy Award nominations for Best Score. Although he often travels for his projects, he does most of his work in Los Angeles, where, at the time we spoke, he was working at Sunset Sound on (simultaneously!) projects for Earth Wind & Fire and guitarist Earl Klugh.

You can usually find **Eric Schilling** ensconced in Studio A at Crescent Moon Studios in Miami, where, besides working (often via EDNet) on both the Phil Ramone-produced *Duets* and *Duets II* for Frank Sinatra, he regularly turns out Platinum mixes for, among others, Gloria Estefan and Jon Secada. Originally a West Coast engineer, Schilling moved to Florida in the late 1970s and worked mainly with rock 'n' roll bands such as The Outlaws and Pat Travers. When Latin and dance music began to heat up the Miami scene, he found himself in the thick of it. He joined forces with Gloria and Emilio Estefan and the Miami Sound Machine in 1982 and has been lead mixer for them ever since. In between those albums he stays busy mixing live music for television, and en-

Don Murray (foreground) and Earl Klugh in Studio Two at the Neve 8088 console of Sunset Sound in Hollywood
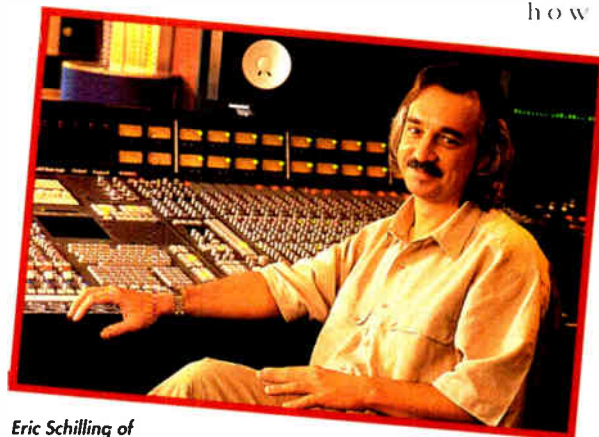
Eric Schilling of Crescent Moon Studios in Miami

Dave Way at Larrabee Studios in Los Angeles

gineering for artists including trumpeter Arturo Sandoval and Grammy-winner Cachao.

Dave Way, based now in Los Angeles, attended Berklee School of Music to study bass guitar. He began his engineering career in New York City, where he worked with the influential producer Teddy Riley on hits like High Five's Number One "I Like the Way (The Kissing Game)," which Way also co-wrote. Lately you've heard his mixes on records by artists such as Babyface, Michael Jackson, Boyz II Men and Brandy, on Toni Braxton's smash hit "Breathe Again," and TLC's "Crazy, Sexy, Cool." Besides spending all those late nights mixing, Way somehow finds the time to play his drums every day. "It's the best thing in the world," he says, "My favorite form of exercise and tension relief—it's the first thing I do every morning when I wake up. I have them set up in my living room with a couple of microphones on them so I can record it whenever I want!"

BASS

Is it the most important instrument in R&B? Not as important in alternative rock? What do you do to make it work the way you want to within the song?

Way: Make room for it is the main thing! You don't want to have a lot of things competing for that space. But lately, R&B arrangements have been a lot sparser, so you don't have to clear out as much, and it's more just keeping it at a good balance, rather than having to spread it and make it feel huge. A good compressor on the bass is probably 80 percent of it, I use an 1176 a lot on bass, or maybe a Tube-Tech—something where you can really adjust the attack and get it to pop out. It used to be, say five years ago when the production style was a little more kitchen sink-oriented, that in order to help put some emphasis on bass in a busy

track, you'd have to stereo-ize it and really compress it to make it compete. Now that things have trimmed down, none of that stuff is getting in the way, and the only thing you have to worry about is the kick drum. But if you are having a problem, it's usually because something is in the way of it. Then I find it works better to filter out something rather than to add something. But, if it's a good bass, like a Minimoog, or a very fat analog bass, and if it's recorded well, half of it's done and you don't have to tweak it that much.

Kahne: To me, it's the difference between live performance and recording. You know that when you go into record you've got 50 dB less headroom than you do in a live show, and that you are taking something that is two dimensions and trying to give the appearance of it being three dimensions. And the bottom or the bassline has so much power in a recording where you are operating at less dynamic level than you are live.

There have been songs that I've worked on where it feels that the bassline isn't coming out enough, and it's not creating enough forward momentum. And in the mixing, even though it may not be there on tape so well, getting the bass to come out changes the whole way that the bottom moves. It just adds so much physical impact to the track that it makes it feel more 3-D.

I use Fairchilds a lot, and I use different combinations of 1176s. Sometimes I'll use two 1176s, or an LA-3A and an 1176. I've also found on the SSL 9000 that the compressor and the EQ are really good. I'll use one [compressor] just to try to pull peaks down a little bit, and then use the other one real radically. Then I try to mix that back into the original one. I do a lot of using different compressors and different EQs and trying to blend them together.

VOCALS

The only part of a pop record that's really important? Something insignificant that needs to blend in with the guitars? Or something that needs to be stereo with a lot of Harmonizer to sound big? What's the most important thing you do?

Schilling: Are the vocals more important in pop? I think that's very true. I also think that the way things are done today for pop music, with the lead singer, whether it's a girl or a guy, they tend to be mixed more up front than they used to be. So the trick for me was

> ## WHEN YOU GET VOCALS TO FEEL GOOD, WITH THE RIGHT EMOTION TO MATCH THE SONG, THEN YOU ARE MORE THAN HALFWAY THERE. —Dave Way

learning to mix where the vocal can be up front but I can still make the track feel very full.

The way I do this, I may work on a mix for part of a day and not really have the voice in a mix. I get it to a point that I like it, and as soon as I turn on the voice and I put it where it's going to be, I rework the mix to create some space behind it. And then it would be very common for the artist to come in and say, 'Well I want to hear a little bit more of myself, or a little bit more here and there,' and then we'll kind of define together where the top of that is going to be. Then I'll go through another process of reworking certain things in the mix to make it feel full. It might be, okay, the voice is higher so I'm probably going to need a little more bass to sit behind the voice—and certain parts of the drums need to be up. But it's not like I turn up the whole track, I just turn up certain things to make it work.

Way: I like to make sure the singer is coming across, especially as the emphasis in R&B has gone more to singers rather than on the tracks, like it was back when I was starting. When you

get the singer to come across, you are not only getting the singer's performance, but the song overall—'cause that's what most people key into, the lyrics and the singer. So there's a lot of weight being carried by the vocalist. When you get that to feel good, and feel right, with the right emotion to match the song, then you are more than halfway there.

As to Harmonizer-type effects, sometimes that stuff can be good; it can make a vocal seem really important. Back when I worked on the Guy record we put a lot of Harmonizer on Aaron Hall's vocal—that was kind of a trademark sound for them, and part of an R&B trend at the time. And at that

time the tracks were a lot busier and if you had a very dry, non-spread vocal with just a little reverb, it didn't cut through. It just wasn't big enough, because everything else was so big. But now, as I said earlier, with arrangements becoming sparser and smaller, thus actually making everything bigger, you can get away with a dry vocal or one that's not very effected—it just goes along with the scope of the way the rest of the mix is.

Vocals are the one place that when you get something that's tracked not so great, you really start pulling your hair out. If the vocal wasn't recorded well, you're kind of screwed—you can't replace it like you can drums. It can be a

WHEN I COMPRESS STUFF, I WANT TO HEAR IT— I APPROACH IT LIKE IT'S A LEVEL CONTROLLING DEVICE BUT ALSO IT ADDS A CHARACTER TO THE SOUND. —Eric Schilling

shame when it happens to a great performance, but, then again, some of the time that tape hiss can add to it!

Kahne: I would never say that the vocals weren't as important—I don't really think about it that way. If you know you are going to lay the vocals back [in the mix], then it has to do with the performer and the way you record it. Because you can't just take a vocal and mix it back. There's a certain kind of a vocal—take someone like Bono [of U2]: You can turn his voice way back in the track but it sounds loud. A lot of singers are like that. Tony Bennett's like that—he's got tremendous tone, and you can

put it farther back

But the hardest thing is when the singer doesn't project that way, and yet you are trying to put it back in the mix, so that you get more of the feel of the band. Then it takes lots of working on EQ and compression forever and ever. I think a lot of times I used to solve that problem with reverb, but reverb to me now is like any other instrument you are adding to a track. I don't like the way reverb spreads stuff out—unless, of course, you want it to spread out. I've come to that insight from working on all this orchestral stuff—it's not that you are making a space, you are actu-

ally adding a new sound as if you had added cellos to the track. And so I started thinking about reverb differently.

MONITORING

What monitors do you listen on at home and in the studio?

Murray: I've been basically an NS-10 guy, but in the last couple of months I've hooked up with a high-end audiophile speaker company called Platinum Audio Ltd. They want to get into the studio near-field, reference monitor business, so they gave me speakers and I've been evaluating them and sending them back and forth, saying, 'Can you give me a little more of this or that.' Now I have a pair where they've basically redesigned the crossover network, and they sound great! It's real smooth-sounding—it gives you much more than an NS-10; it just has much smoother low end and high end, because the NS-10s are pretty midrangey and have that upper midrange bump. The Platinums are real good, even if I have the only pair that sound like this! So I've been using those, and Sunset [Sound] has the JBL TAD big monitors designed by George Augspurger. I

IT'S AN INSTINCTUAL THING THAT ONCE I START WORKING ON A SONG I KNOW WHAT IT SHOULD SOUND LIKE. —Don Murray

don't rely on them a lot for mixing; I just put something up there to check out the low end on a mix. But most of the time I mix on a pair of Phillips speakers that I have, little 3-inchers, the size of an Auratone, just little cube speakers that I've had for 15 years, and they sound great at a very low level. Ninety five percent of the time I'm working on those, so I can work ten hours straight and really not have any ear fatigue, because I'm listening at about 70 dB.

Way: In the studio I have three pairs that I bring with me all the time. I have NS-10s with custom crossovers that a friend of mine made, that I love—nobody else really knows about them I

think, except people who have come to my sessions and liked them.

They take out a bit of the 1½ to 2k emphasis and make them a little more realistic, but they still sound like NS-10s and still have enough hype in them that you recognize that and get the same characteristics.

Then I've got two pair of Tannoys, System 8 NFM2s, one of which I keep at home. But actually they are not my critical ones at home. My stereo at home is a Panasonic receiver that I remember going to buy with my Dad when I was 8 or 10 years old. It has faders for the volume and pan and bass and treble—that's one reason I like it. It weighs about 100 pounds. And I've

got a pair of Realistic speakers that were probably the top of the line at the time that my dad bought them. They are my main home speakers. I've been listening to them for 15 years—went through college with them. I've never really abused them, and they still sound good. And those are the speakers that I know better than anything in the world. It kind of goes to show me that it's really all what you know.

Kahne: I listen at home on Yamahas, and these speakers called Wrights. They are these coaxial speakers, more like Proax, except they have a little more bottom and they are not quite as dry. Kind of in between Proax and Yamaha. They're very phase-locked. I bring mixes home or I set up a system in another room at the studio, where I'll have blasters and maybe I'll put up some speakers that I don't know anything about, like Tannoys.

In the control room I use Yamahas, and Auratones, and KRKs.

Schilling: I have to say that after all these years I'm still working on NS-10s. I've tried all kinds of near-field speakers, but the NS-10s just seem to work for me, and I don't see the need to

throw them out. The bigger monitors here are a large Quested system that I really like the bottom in. When I mix I'll work pretty much the whole day on the 10s, and I will refer to the big monitors to see what it will sound like on a good stereo, one that has a lot of bass. Another thing we've started using are the mid-sized Genelecs. I did the Sinatra album [*Duets II*] with Phil Ramone, and that's what I used for that, because mixing a big band album on a pair of 10s gets a little tough.

Do you have a jacked-up car system that you listen on?

Way: Yeah, I can't live without it. I think I need new speakers at this point

because I've just abused them for too long now! But I can check the low end on them sometimes even more than in the studio. Because they were kind of abused, if I had too much bottom end I could tell pretty easily because it just wouldn't handle it. Of course now it's at the point where even if it's a good amount of bass it can't handle it. But yeah, I do check in my car all the time, and, if I can, on a break, I'll bring a DAT home and play it on my speakers at home and check it out—that shows me everything.

Schilling: I have a custom car system with subwoofers in back. I dumped a lot into my car because I don't play a

lot of stuff at home—it's kind of my retreat. If you come to my house and want to put on the sound system, it's like, 'Oh, let's not do that! Let's do something else!' But I do play a lot in my car; that's really my listening area. So I have a DAT machine, CD player, cassette player, the subs in back—a good sound system so I can do a lot of judging. I take up my whole trunk for this system! When I get in my car to drive to work I turn on the sound and I play it the whole time until I get there. That's my environment. Granted my system is probably a little more high-end than most, so I do try and listen to my work on something else. I'll take it to the back room in the studio where we have a little stereo—something you would find in a store for $500, the small ones that you stack on a shelf. That kind of stuff I will also check stuff on. Just to see how it works.

MONO

Well, what about it?

Way: I've become a big fan of mono in the last couple of years—I remember seeing Phil Spector with some button that said "Back to Mono" and it started me thinking, and in the last year or two my mixes have been a lot more mono than stereo. I think it's because, if you've just got something coming out of one point source, panned 100 percent left or right, or you've got it equally coming out of both speakers—in other words, in the center—without any delay added, or chorus, or some kind of slapback, it's just going to have more impact. Because of the phase coherence, when it finally arrives to you, in your car or ten feet back from the speakers, there's just less smearing going on. So I try not to add as much chorus or Dimension D to things as I used to. And it makes things pop out more.

Kahne: I love mono. I just love the directness of it and the fact that all the relationships are absolute. There's nothing moving around. For instance, a reverb—you can put it exactly, and it stays there. It doesn't do that in stereo. In stereo you know it's in the same place and you haven't turned it up, but somehow it can make things kind of cave in on themselves. I also like hard panning left and right sometimes. Listen to [The Beatles'] *Revolver*, to "Taxman"—when you listen to those records in their original form things are really, really left and right, or they are mono. Like in "Taxman" the tambourine is really loud on the right, the

drums are on the left, and you can hear the room so clearly.

FAVORITE GEAR. COMPRESSORS? OTHER?

Schilling: Favorite compressors? Ones we have here that I use a lot are Audio Design Compex, which they don't make anymore. It has the same compression element that they used in the Vocal Stressor, but without the EQ. They are real ballsy—you can do a lot of compression if you need to and still have a lot of punch. Tube-Tech stuff I like a lot. 1176s I still use a lot. My attitude is that when I compress stuff, I want to hear it—I approach it like it's a

level-controlling device but also it adds a character to the sound. I think it's from all those years of listening to Beatle albums—all that compression just gave it such a great sound. I don't look for compressors I don't hear, because what I've generally found is if you don't hear the compression at all, you turn your back and suddenly realize that you don't have any range left. I find this sometimes happens to me with the Aphex Compellor in the rack at the studio—it being so transparent. But by the same token, in a broadcast situation across a mix, it's the greatest—especially if you're uplinking live to a satellite where your headroom is very limited.

We just put in a Neve Capricorn console in Studio A. It's been quite an experience to learn to work on it. It's a dream I've had for a while, because when you're working on a 96-input board, and you've got to go all the way down to the end to do something, you can't really hear what you're doing. It's really kind of ridiculous! And with the Capricorn you can basically work in the center all the time. And for the people who say, 'Well, I don't like it not to be able to see all my faders,' or 'I can't get to it fast enough,' my retort is, 'I can hit a button and see the next bank of faders in front of me in less time than it takes to wheel your chair!' And I'm always sitting in the center so I always know what I'm hearing. Although there are pros and cons to digital, that's one of the pros!

Now that we have this board, my approach with signal processing has had to change a bit because it's not an analog device. My basic rule of thumb so far on the Capricorn is, when you compress, take all of the factors you would normally use on an analog device and cut them in about a third. Because it's just not the same kind of beast and you really start hearing it too stepped on.

Kahne: I love 1093 Neves; they are just the best. I also use Focusrites and a rack of API 550s. Sometimes I use the EQ in the computer, because I have 16-track Logic Audio. It's a sequencer that has audio capability as good or better than Pro Tools, but I think it's also the best MIDI sequencer that there is. It's a great program, but it's got an intense learning curve. I dedicated a tremendous amount of time going from Performer to it. But now that I'm there I've been converting all my Performer stuff—about 500 pieces. So I have a Mac that I run all the time and I can fly stuff over, and there's some really interesting digital EQ and effects and stuff that are in the program. I also like the Wave stuff—they've got a digital compressor that's really amazing; it runs off the Logic Audio.

Murray: I still have my ADAP 2 digital workstation. The company is out of business, and hopefully it won't break down, because for what I need it works fine. I can get about 30 minutes of sampling time, stereo at 48k on it. I don't need more than stereo because I'm always using a multitrack machine when I'm working with it. The A-to-D/D-to-A converters still sound to me as good as anything and compared to other units I still like mine better. It locks to SMPTE,

it time compresses, it does a lot of the things that I need it to do.

But I'm basically an analog guy unless I'm forced into anything else. I'm mastering now to Ampex ATR-100s using the Flux Magnetic heads, which are a great improvement on anything else, like 200 percent better than the stock Ampex heads. Oh, and I'm really depressed about the fact that 996 tape is being taken off the market. I've been trying other tapes. I've been comparing, and nothing's coming close yet. I can't believe that someone doesn't buy the formula and start making this tape. Because, when it's run out, it's a step backwards, believe me.

Compressors, I still rely on the old standbys, LA-2As, the old things. There's a new tube mic preamp made by Forssell Technologies that I've been checking out, called the M1. I've compared it against the Jensen 990 mic pre's, the Millenia and Demeter, and this one is good; better.

Way: The Manley stereo compressor—that's all I'll say. My favorite piece of gear.

EDITING: ANALOG? DIGITAL? WHAT?

Kahne: I record and mix to analog, and I do analog editing, a ton of it on the 2-inch if I need to and sometimes also on the half-inch. But with digital, in a way, I think it's gotten to the point where you can do stuff that there's no analog equivalent for. And it sounds really good; it's really different.

Plus, if you need to make some pitch corrections or fly things around, it's just kind of there all the time—it's really a luxury. If I had my own studio, I'd have that completely locked. And I'd have an SSL 9000 and two 16-track analog tape machines!

Way: Half-inch—all the time. Maybe once or twice a year on the computer.

OTHER PEOPLE'S WORK

Do you listen to outside mixes when you are working?

Way: No, hardly ever. I think that can end up confusing you. Maybe at the beginning I would, but after I've done my mix I never start to compare to some CD and then to tweak it try to make it sound like that. I'm more likely to use the slave mix for a reference, because that's what the producer and the artist have been listening to the whole time. But there are times I just wish I could sit in on somebody's session, you know, say 'Do you mind if I just...'

Schilling: Sometimes, but that's usually

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at the request of a client. I don't do that actively when I mix, but what I do a lot is, there are certain people I'm a big fan of and I'll listen to their albums a lot while I'm driving, and absorb certain things that they do.

Murray: Not necessarily when I'm mixing. It's an instinctual thing that once I start working on a song I know what it should sound like. I certainly experiment, but I'm not necessarily trying to copy something else. I listen to other music in the car, or at home, but I'm listening as a consumer. I don't sit down and analyze the snare drum sound of Collective Soul or something like that. I'm just listening as a consumer and enjoying the music. But I think I'm influenced by things I hear outside; you couldn't help but be influenced.

MASTERING

How important is mastering to you?

Kahne: Very important. It used to be that it just seemed like a guillotine, because you go in there, and every dream you had is—well, you are listening to the final product. Now, I think about it all the time during mixing, because I've found there are some things, like when you are getting a vocal to be brighter, and the track will start to sound funny. And I'll think, I'm going to put one down like this, where I know it's not quite right but I think EQ'ing during mastering would be better than me working on the vocal here, because of the way that it changes the relationships in the track. And that's been really helpful to me.

I also usually like to get somebody's impression of the mix and see what they do, and then get really intensive about what I want changed. And, on the production side, I think about mastering in terms of how the songs fit— what they mean going from one to the other. And volumes, coming out of one song that ends a certain way and going into another—the dramatic effect of a change in volume or a change in key. All that stuff is really important to me from my musical background. So, now, even if I'm just mixing something, and not producing, I find myself thinking about it a lot. Like Presidents [of the United States of America]—most of their songs are in C sharp. They use that because they get this different kind of rhythmic thing going by playing in those open tunings. But the songs end up almost all in that same key, and it was real interesting sequencing.

Schilling: I think it's crucial. I've been using Bob Ludwig for 16 years, and I

always try to go. I learn a lot about my own work when I go to Bob—it's a good experience for me because I see what he needs to do to my work, and I hear it in a different environment. My goal is that he doesn't do much to my work, but by the same token, there's generally something that you need to do, and something that I want to tell him about. Especially if you've got ten songs and you kind of want them to match, you're gonna need to make some adjustments to those ten songs to make them work as a group. So, if nothing else, even if you were cutting your stuff flat, you still have to deal with changes in volume and things like that to make it work.

So, I love Maine [where Ludwig's studio is], I get to eat lobster, and I get to learn a lot! A lot that we've done in the facility here is stuff that I've learned from Bob, especially about digital. I pick his brain every time I go up there. I see a new box or rack and it's, 'Well, why do you have this?' I'm kind of like a pest.

Murray: [Laughs] Well, it will make or break the record! It's extremely important, and a really difficult part of the process. You have a 2-track master that you've been listening to in the studio that sounds right to you, hopefully. You're happy with the mixes, but you want what you are happy with in the studio to carry over to what people are listening to when they put the CD on at home. I've worked at Capitol for maybe 18 years, with Wally Traugott, and his room there is my standard of reference. I go in to work with him, we just sit down and, at this point he basically lets me EQ. I ask him his opinion on certain things. I take a personal role in the mastering, and Wally is basically my partner in this step. A lot of times there will be new A-to-D converters or other new things that are out, and we'll check things out, experiment and A B. He has access to any new piece of equipment so we'll go in there and try things.

It's also a fun part of the process because it's my final tweak—after that there's nothing more I can do with it! To add a little bit here, adjust the levels— also overall level—we have to make sure that we're right there with everything else on the market, that it's loud enough. So we compare levels between our product and other product. ■

Maureen Droney is Mix's Los Angeles editor.

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t e r !

BY TOM KENNY

Twister, the most talked about, hotly anticipated visual effects film since dinosaurs roamed the screen, is not your typical summertime action-adventure fare. There are no gun battles, no explosions, no squealing car chases or exploding planes, no aliens or orbiting spacecraft. Reduced to simple terms, *Twister* is man against nature, and in that respect it re-creates a style of tension and fear not seen on this scale since *Jaws* made a splash on a July weekend in 1975.

The comparisons in the previous paragraph will not be lost on filmgoers.

The Warner Bros. release is an Amblin Entertainment production, and Steven Spielberg served as one of the executive producers. There is even a little Indiana Jones thrown in, as the unassuming, ragtag collection of storm-chasers take on heroic qualities in their race against a well-funded but sinister corporate group to better understand and predict tornados. The different twist is director Jan De Bont, who established a more heightened sense of immediacy in his main character: the computer-generated series of tornados.

The Twister mix crew in front of the Otari Premiere on Universal Stage 3. From left, executive music producer Budd Carr, dialog/lead re-recording mixer Steve Maslow, director Jan De Bont, film editor Michael Kahn, effects re-recording mixer Gregg Landaker, music re-recording mixer Kevin O'Connell, supervising sound editor Stephen Hunter Flick, music editor Zig Gron.

De Bont, a director of photography whose credits go back to *The Fourth Man* and include such action flicks as *Die Hard*, *Robocop*, *The Hunt for Red October* and *Basic Instinct*, made his directing debut last summer with *Speed*. Visual effects certainly played a large role in the success of *Speed*, but as event-specific filmmaking magic, not as a main character. In the same way that De Bont and the visual effects team at Industrial Light & Magic had to create a different identity and quality for each of the five twisters that roar through the film, the audio post-production crew had to establish different voices.

"Each tornado has its own character...," says dialog re-recording mixer Steve Maslow over lunch at Moe's in Hollywood, "...and whether they're a watery, high-frequency tornado, or ground-pounding, earth-shattering twisters, they all sound different," interjects Maslow's partner in crime for more than a decade now, effects re-recording mixer Gregg Landaker. "We didn't want to reveal all our cards right off the bat in reel 1 or reel 3. We knew we had to get to this 'finger of God' destruction, the last one, the F5, so we couldn't design it so big that it made the F5 seem small in comparison. With the winds and low frequencies that Kevin [O'Connell, music re-recording mixer and 'helper guy'] and I had in hand, we built the characters up to the large one, the payoff."

An individual tornado's intensity is

measured on the Fujita scale, from 1 to 5. *Twister* deals with F3s and F5s, and when you stop to consider the number of audio elements that went into any one reel, especially the climactic F5 in reel 11, it's somewhat surprising that the film didn't turn into a wall of sound. More than 600 DA-88 tapes worth of effects were delivered to the mix team at Universal's Stage 3; reel 11 contained 15 predubs just for the tornado; three 16-channel Pro Tools 3 systems—for effects, ADR and music—handled changes at the mix, with a fourth offline in a cutting room (effects units were duplicated on 1-gig Iomega Jaz drives for easy loading); some of the twisters were made up of as many as 250 tracks; and the recordists in the machine room—Brion Paccassi, Brad Biggart and Kevin Brooks—who have done monstrous pictures, including *Waterworld* less than a year ago, said it was three times as many elements as any film they'd seen. But you know what? It won't even be the loudest film out this summer. And that achievement can be credited to both tasteful editing and a delicately balanced mix.

THE TRAILER, THE DESIGN

"We didn't start with a script, we started with a visual effects test," explains su-

pervising sound editor Stephen Hunter Flick, who won an Oscar for *Speed* "That was March 1995, and it was spectacular. So I went in with Gregg and Steve for a couple of hours, and we did a 4-channel mix that subsequently ended up in the trailer and TV campaigns. The reason it's important to talk about the trailer campaign is that we weren't able to do any temp dubs on this picture because the [computer-generated] opticals were due in late January—very close to our mix time. So the trailers allowed me to play with the sounds of the tornados and develop concepts that would be approved by the studio, and they allowed me to go into the mix with a point of view. By the time we did the second trailer, we had essentially acquired the dragon characteristic of the tornado, which is prevalent all the way through.

"I think of pictures, in terms of soundtracks, as mythological," Flick continues. "What kind of fable or story are we telling? To me, fairy tales are dark and gripping pieces that move our subconscious. But we don't have any sort of European folklore of leprechauns and elves and fairies. We basically have man against nature. We have the literature of the new world. We have Whitman and Jack London

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SCENE

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EFFECT-1 -2

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LOCATOR

and Hemingway and modern writers dealing with man living on the face of this Earth, with realistic issues of weather and natural disasters driving the drama in our lives. Look at earthquakes, look at tornados. They kill lots of people every year. I'm looking at this as a mythic adventure of Western and Midwestern America. So I can call the tornado a dragon.

"The entirety of the work is based on naturalistic, documentary recordings of the Midwest. You start real, and then you ask, 'What do I remember and what am I afraid of about a tornado?' So we talked to people who had seen tornados, and we watched lots and lots of tornado documentaries and listened to every time they discussed the sound. I'm not looking to them to listen analytically; I was looking for people who are not sound or audiophiles to tell me stories about how they *felt*.

"One person said, 'A thousand pigs squealing.' Other people said repeatedly, 'freight trains,' 'sounded like a jet,' 'I heard pops and booms.' Then I had looked at how my naturalistic sounds worked and how traditional methods of musique concrète preparation worked

with animal voices. Then I looked at the essential sonic literature of radio and film, mainly *The Wizard of Oz*. I looked at all this to figure out what people reacted to when they thought about tornados and what made them afraid."

In many senses, *Twister* provided Flick and his team with a chance to re-examine what sound effects are. It was a time to re-assess, he says, a return to his roots. After the long, hard year of *Speed* and *Apollo 13*, Flick stepped back to study the nature of wind and how physical acoustic devices could make and control the sound. Before he could talk about dragons and monsters and the audience's collective id, however, he needed original material.

In the summer of 1995, Flick sent sound recordists Eric Potter and Wayne Bell to Texas to gather authentic prairie ambiences. At the same time, he met with Foley artist John Roesch and sound recordist/designer Ken Johnson about collecting wind sounds. They decided to build two wind machines—one brand-new in the traditional spindle style, and one that fit in the back of a pickup truck to capture and manipulate real wind. One generates

wind, the other sort of captures and manipulates real wind. There is a difference.

"Wind machines don't make wind," Flick explains. "They make the sounds that people conventionally understand as wind. We built one of those. Then Ken built this wooden box—he called it Dr. Marvel—and he strung piano wire and fishing line, bungee cords, wood strapping, metal strapping, loose and hard, tuned and out of tune, Coke bottles full of fluid, all sorts of things. We put it in the back of a pickup and drove it down hills in the desert at 70 miles an hour with a pair of mics well-wind-screened in the back. Every time we added something to modulate the wind, it sounded different. And we could control the pitch by the acceleration of the vehicle, and by having some fast stops. A mobile aeolian harp.

"We had already done about six months of documentary-style recording, and we had all these great growls and grumbles and naturalistic winds. What we needed was that core pitch shift. And the only way you can get that is to build a controllable device, or by varispeeding it. We found we were

able to change the pitch and create the sound of acceleration, because drama, as we know, comes with a pitch shift and a change in volume. Volume is a piece of cake. But to create winds that would physically shift pitch on cue, you have to manipulate them in some way. And it has to have a realistic place to start acoustically."

The amount of material, nearly all of it organic, that went into any one tornado is staggering. Animal voices, real winds, train-bys, whistle-whines, buffeting thumps—all of it layered and assembled in Pro Tools, most of it by sound designer John Pospisil. He was the tornado guy who delivered finished voices to the editors for placement and further manipulation. There were angry winds, soft winds, gentle winds, percussive winds, monster winds, growling winds, high winds, low winds and midrange winds. Much of the processing took place in Pro Tools or with a Lexicon PCM-80. The only dictate was that the wind had to keep moving. Sta-
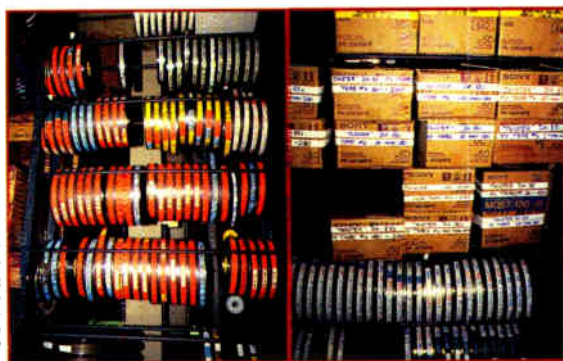
A view from the machine room. At left, reels of Foley; at right, boxes containing the 600 DA-88 cassettes for effects alone.

tic winds are death.

"You can't have constant wind," Flick explains. "Some of the people we interviewed said the tornado pulsed, so John took some low-end tones of animal voices and created a low-frequency undulating tone that wasn't in the pitch area of rumble, one that would pulse and undulate—kind of like a more aggressive soft ocean wave. And it had to be arrhythmic, because rhythm becomes music. That doesn't mean our sounds don't have rhythm and meter and structure. It just means that we deal

with rhythm and meter and structure only as it relates synchronously to visuals. This is a 5/4 tornado in a 4/4 movie."

THE EDIT

Despite the large number of units, this was not a large audio post crew by blockbuster movie standards. At most, there were 25 editors, including assistants, working on the film at Creative Cafe, Flick's new editorial house that he co-owns with his wife, Judee. To ensure consistency, editors were not just assigned reels, they were assigned responsibilities. And in addition to hard effects, they delivered multichannel premixes to the dub stage. Gregory Hedgepath and Charles Maynes took on the moniker of "Twister Twins."

"I would say Charles was a little more synthetic in his treatment, where I was going with animal sounds," Hedgepath says. "But any effect we put in had to have movement, because if you put in a steady and play it loud, it may sound great, but then ten seconds later, you say, 'Okay, what next?' Con-

sequently, we both tended to do more premixing on this film than I would suggest an editor do when I supervise films. I would duck effects and swell them up, but never the same movement on every track.

"For example, I put together a 4-channel mix where a tornado comes right up on the characters and begins to stroll around," he continues. "I recorded my fader moves on my CS-10 MIDI mixer a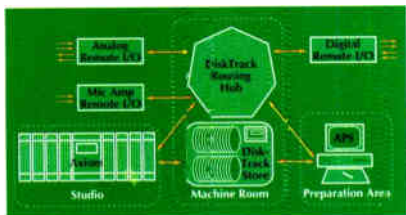t half-speed and swirled them around the room—picking up speed as it got close to them and slowing down as it moved away. Then I would take those four tracks and maybe do two other groupings of different wind sounds—like maybe a nice constant wind, where the faders give you the movement, and maybe a buffeting wind. One is high, one is low, so you pick up three colors. Start with the high, add the medium as they get closer to it, then when it's really upon them, the low wind swells up. Then they go away and you reverse it."

Automated or volume-mapped edits are not recommended, especially without consultation with the re-recording team. Because of the time constraints on the final and the massive number of elements, it worked on *this* film. "One of the pivotal experiences for both Greg and me was the sweeteners on reel 1 tornados for the final, because it was the first time we had done heavy automation to the point of predubbing in our systems.

"Charles and I are both mixers as well as editors," intercuts Hedgepath, "which gave us the confidence to premix without tying the mixers' hands in the final."

"We needed more movement," continues Maynes, "but we found it difficult to convey our intentions by just laying the units up and doing fades. There was plenty of discussion at the shop about whether we should do this. Old-style editors said we were trying to do the mixers' job for them. But we just felt there was too much information, and we didn't think we could make up units that would play to the degree of activity we were looking for. Steve Flick is big on having an editor go to the dub stage to dub their reel. He is one of the finest supervisors because he has his ego in check."

The 4-channel treatments worked well on the wind, and there was plenty of swirling at the final. But this story is also about layers. When cutting the first tornado effect for the film, Maynes was working on *Mulholland Falls* and came across a fast-but-smooth merry-go-round sound in the DAT library, recorded from the Scream Machine in Santa Monica. Run through a PCM-80 (with some modifications on the Finish Line patch, a sort of multivoice Doppler), it became a subliminal building block for the tornados.

Meanwhile, Martin Lopez of Digital Sound Design in San Diego came up with some stunning 4-channel recordings of train-bys, which were "massively limited" in L1, a Waves plug-in for Pro Tools, then dropped in. Hedgepath came across a very slow diesel freight train that added a crunchy sound, which he described as "wind made of razor blades." Maynes also made regular use of the Focusrite TDM plug-in, which allowed him to notch out and boost certain frequencies to place individual colors or sparkles inside a much larger and more violent wind sound. The L1 became key, and distortion ruled the day, replacing reverb as the treatment of choice. Warren Hamilton, who the Twister Twins referred to as their Godfather of sound effects, would walk by and tell the two: "We need more grit. Grit it up."

"When the twister is upon you, like in reel 4, it's always great to add the old constant-acceleration effect," Hedgepath says. "You take some sort of whine

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that increases in pitch and you lay it over itself so it appears to keep going up. It's a tension-building device that was used in the trench war in *Star Wars*—the x-wing fighter was always accelerating. Ben Burtt taught me that. So I got an inertia starter out of the library—similar to the effect used on the cartoon Tasmanian Devil when his feet start moving. I pitched it down two octaves, then four octaves, then overlaid them on top of each other, then ran it through two L1s, and you get this tremendous, increasing, distorted whine that goes up in pitch. Something really bad is coming at you."

"I'm a big fan of L1," adds Maynes. "We figured out that when we put two of them in a line with maximum limiting, it made the most ungodly distortion. You could run an interesting moving wind through it and end up with something that sounded like the world ending. Then we put that into our spinning automation and it ended up fascinating."

"That's something I got from Randy Thom up at Lucasfilm," Hedgepath interjects. "His famous saying when I used to work up there was 'Distortion equals art.'"

So much energy and so much of the drama is focused on the tornado that some excellent Foley work, ADR and music may appear to get short shrift in these and other pages. Flick, who has edited some big films, including cutting on *Raiders of the Lost Ark*, says this was by far the biggest Foley show he's ever done. Wind, by itself, is not that interesting, Flick maintains. It's the dust and debris it whips up that adds the color. Not to mention flying objects—from truck crashes to knives and shards of glass being flung by the main character's ears and into a barn wall. Kudos to Foley artists John Roesch and Hilda Hodges.

Judee Flick cut more than 1,200 lines of ADR for the film, which isn't at all surprising considering they had two jet engines on the back of a flatbed during production to generate wind, along with ice machines to shoot hail, regular wind machines and lots of dialog in cars. ADR was recorded to DA-88, then loaded into Pro Tools for editing.

Music was composed by Mark Mancina, who also scored *Speed*. There is actually a surprisingly small amount of music for such a big "quest" film—roughly 44 minutes of score and 32 minutes of source. But according to all sources, De Bont shoots in a way that provides effects moments and music moments, where by and large music will carry a scene until you see the tornado, then effects take over. Mancina was invited to a few advance screenings of the trailer last December so that he would have an idea of how the sound effects were going to be played. The score was recorded to 48-track analog, then loaded into Pro Tools through Apogee converters.

"Jan is one of the top directors I've worked with in terms of being aware of the potential conflict between music and effects," explains Zig Gron, music editor on *Batman Forever*, *Assassins* and *Don Juan DeMarco*, to name just a few recent credits. "I'm a music editor who happens to believe that if the music needs to be lowered or dumped because of the emotion of the scene—which is unusual because music normally plays emotionally—then I'm all for lowering it if it will make the film better. I believe music can work with effects.

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Above: Producer Edit panel; below: Mixer panel

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Above: StudioTracks edit screen; below: segment editor; inset: dynamics DSP
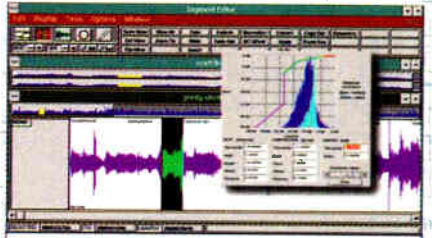
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"Mark delivered the music separated onto 16 tracks of Pro Tools—left-center-right orchestra, left-center-right percussion, left-right brass, left-right synthesizer, left-right guitar, left-right choir, left-right woodwinds," he continues. "That gave us control, because we didn't really know what we were up against sound effects-wise. So if sound effects were going crazy, percussion is one of those things that can get drowned out. So we ended up boosting the percussion about 2 dB all the way through the movie, just to give it some drive. In another scene, we ended up going with choir to cut through the big effects."

"On *Speed*, there were a lot of very literal visuals working with sound," Flick adds. "See something, hear something. But in this picture, there is a lot of sound driving the drama—we hear a tornado offscreen, and it moves the drama forward, or in the house sequence, we hear noises and the characters react. It's in the writing and in the way it's photographed, and by having sound more entwined with the drama, as opposed to being sound *with* the drama, he's become a much more complex filmmaker, which is a delight for me.

"When I started to think about soundtracks in a whole sense in the early '80s, as opposed to earlier, when I was just cutting sound effects, I realized that with any modern picture where you have lots and lots of sound, and the score is dynamic, you have to trade licks. You have to be able to produce a unified, whole process."

TRADING LICKS AT THE MIX

The music metaphor of the tornado is not a stretch, and in many ways, the sound of the individual tornados can be thought of as jazz pieces, fluid and arrhythmic, with complex tonal layers. While the editors are essentially concerned with making "musical" effects—in fact, Flick says, he only hires editors with a music background—the re-recording team strives for that delicate balance between dialog, effects and music, the unified whole referred to by Flick.

You won't find a better re-recording threesome than Maslow, Landaker and Kevin O'Connell, who was brought over to help on *Twister* from his regular gig as a lead mixer at Sony. It's not just the technical chops, or the awards or nominations—though they each have plenty of both, with Landaker and Maslow holding three Oscars and O'Connell with nine

nominations. It's more in the way they can put an entire dub stage at ease and inspire complete confidence. Universal's Stage 3 is their house, and despite the pressure of a big film and the fatigue of three months of 12- to 16-hour days, they are relaxed and jovial just two days before the print master. The three can create an entire comedy routine out of the curly fries at lunch, trading licks in the same manner they do behind the Otari Premiere (with Concept 1 sidecar) on the stage.

"We knew going in that this had the potential to be a loud movie," says Maslow. "So we went in with the premise of letting me set the dialog to

what I felt was a comfortable level, and that gave me a frame of reference. Everything was based around that level—all the tornados and winds and music—everything was bobbed and weaved to facilitate hearing every word. Kevin came in next with the music, and then Gregg supported it with effects."

"At no point is Gregg trying to override until it's time to let him go," explains O'Connell, who in addition to mixing music served as an extra pair of hands on the effects premixes. "If we tried to do this film the old-fashioned way, with effects trying to overdo it, we'd still be mixing the movie. It took

us 150 films to get to this point," he
says, and they all laugh.

Bobs and weaves, peaks and val-
leys—this particular film mix was all
about movement. "We picture Jan's
films as roller-coasters," Landaker says.
"You take an audience, have them grip
ahold of their seats and say, 'Omigod!
Here we go!' They go through the falls,
through the terror, and then relax. *Speed*
was a quick-hitting roller-coaster; this is
more about long undulations into terror.
And at the mix, that's mainly done by
not playing all 800 units at once, even
though you have them. It's built from
maybe five units here, then another 30
to 40 feet in, you introduce something
else, then something else. It's constantly
moving on the sliding scale of intensity.

"I approach sound effects mixing
thinking that I want to have the audi-
ence walk out and say, 'What a ride!
That was worth seven-and-a-half bucks.'
I want to create a 3-D theater environ-
ment illusion for them, something they
can't get at home. I want the sound of
that twister 15 feet in the middle of the
room. I want them to feel what they see.
If we just play it flat-screen, then it be-
comes simply watching a movie. I want
the audience involved; I don't want to
be invisible."

Certainly, the 5.1-channel digital film
sound formats (*Twister* was released in
DTS, Dolby Digital and Sony's SDDS)
play a large part in creating the 3-D en-
vironment. But all three mixers are
adamant that the 5.1 channels are not
about making a film loud; they're for en-
veloping the audience. The surround
work is not overdone, though it does
provide the swirls. And surprisingly,
Landaker, perhaps influenced by O'Con-
nell, is a recent convert to the use of the
subwoofer—he did not employ it on
Speed.

"After *Crimson Tide,* I really got to
know subs," O'Connell says, pun in-
tended. "From the second the tornado
arrives until the second it leaves, you
could literally drive the subwoofer at
100 dB and it would be fine—most
mixers would have done that. We
never did that. We modulated that sub-
woofer in and out, and what we put in
the sub is not a steady rumble track, no
pink noise down at 20 Hz. It was a
modulated, very dynamic track that
would make the sub key on and off, on
and off. Same with the surrounds. We
never played things straight."

"This picture deals with a lot of
mid- and low-frequency information,"
Landaker cuts in, "so we can create a

in the real

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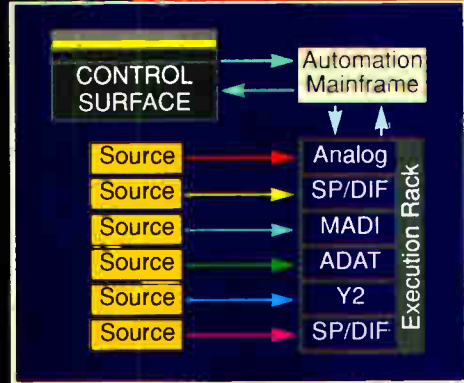
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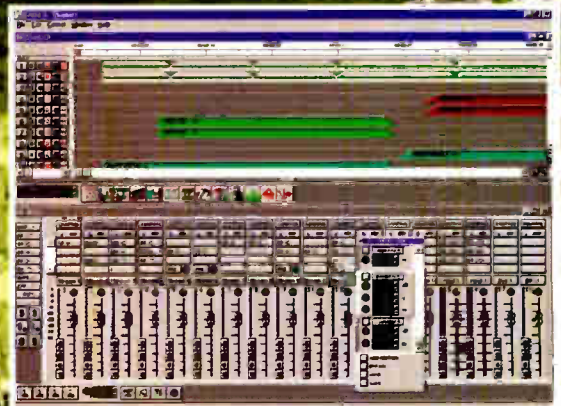
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Large FORMAT Recording Consoles

by Chris Michie
& Sarah Jones

THE STATE OF THE ART 1996

Soundtracs Jade 48PB

all it what you will—console, mixer, desk, board—the single most expensive piece of audio gear in a 24- or 48-track recording facility is likely to be the console. Though acoustics, monitoring systems and even wiring can have a greater effect on the actual and perceived sound of a recording, the console often occupies a disproportionately large space in a studio client's mental picture. Engineers become addicted to particular models, and musicians often remember which board they last recorded through. Some of this exaggerated respect for brand names and model numbers is justifiable—the sonic and operational differences among con-

soles are often significant—but often the choice of console has as much to do with marketing as audio specs. A "name" console may bring in business that a technically more sensible choice may not.

Some studio owners select a console on purely technical grounds; for most price is a serious consideration. But there are other factors to consider: Who owns the company and what are their long term goals? Where is the nearest technical support resource? Is the console flexible enough to cope with coming technology or is it upgradable? What automation options are there? What resale value will it have in five years?

More than any other piece of equipment, a console reflects the taste and values of its owner. Some studio owners are practical and economical, others are flamboyant and idiosyncratic, even eccentric. Some are devoted to "clean" circuitry and low noise floors, others to operational flexibility and sophisticated functionality. Fortunately, console manufacturers are a diverse bunch, and there are console designs and prices to fit every requirement.

Tactile Technology T2

SSL SL 9000 Series

Neotek Élite w/Sidecar patchbay

GENERAL NOTES

All consoles listed are 24-bus (and higher) configurations and are analog designs, unless otherwise noted. Most models are offered in a range of frame sizes; expansion capability is not always noted, although most can be ordered in a short-loaded version, and additional modules can be added as channel requirements (and budgets) grow. Most consoles offer a combined bus addressing scheme whereby channels are assigned to either buses 1-24 or buses 25-48 in two or more banks. Some consoles assign to each bus discretely, some only in pairs; some allow assignment to both banks at once (though with limitations). Some consoles offer onboard dynamics processing. Specific circuitry features and automation options are not described in depth.

AMEK

Designed by Rupert Neve, the TEC Award-winning **9098** from Amek (U.S. offices are in North Hollywood, Calif.) is a large-architecture console that can be configured to customer requirements for recording, broadcast and post applications. The 9098 is supplied with Amek Supermove moving fader automation, Amek RECALL, Amek Virtual Dynamics, Amek Visual FX outboard equipment control software, and Amek Superloc machine control. The 9098 is a radical departure for Amek—it's the company's first console targeted at the up-market sector that Rupert Neve's designs have traditionally been associated with.

The 9098 console building blocks include 24- and 32-module chassis sections, single- and double-bay jackfields, and an eight-module monitor section. Three input modules are available: the 9098A mono, the 9098K dual and the 9098L stereo input module. These may be combined in a variety of ways, and the 9098 may be configured in split or all-input format. Input modules offer 48-bus addressing through two banks of 24 switches, plus an additional four stereo bus assigns. The A and K input modules are also designed to act as group masters, and the A module offers comprehensive stereo, quad and LCRS panning facilities. EQ on the 9098A module is 4-band, with the two mid bands sweepable (HF and LF EQ sections offer six switched frequencies), and there are additional variable high- and lowpass filters. Various switches and pots allow for selective notching in the mid frequencies and alternate filter slopes in the HF and LF sections. EQ

for the K and L modules is comparable, if less extensive. The 9098 offers 16 auxiliary buses that are variously addressed by stereo cue and mono aux send pots on the input modules, and as many as 18 switches can be controlled by automation. Amek's Virtual Dynamics package allows for the insertion and automated operation of compressors, limiters, gates, expanders, etc. on each channel. And so on; the 9098 is not short of features. A 72-input 9098 costs approximately $625,000, depending on configuration.

Galileo is Amek's latest console and is designed for music recording, video post and film-dubbing applications. An in-line design available in 40- and 56-input frame sizes, the Galileo is supplied with Supertrue VCA or Supermove moving fader automation, Amek Superloc machine control, timecode reader/generator, Amek Visual FX, Amek Recall, and Amek Virtual Dynamics.

Input modules contain two signal paths; the Galileo can handle twice as many inputs on mixdown as there are input modules—with full EQ on each channel. The input stage includes a Rupert Neve-designed TLA (transformer-like amplifier). The 24-track bus assignment is via 12 switches that address the buses in two banks. EQ sections for the channel and mix signal paths are 4-band parametric with bell and shelf switches for HF and LF sections and additional swept high- and lowpass filters. The EQ may be reassigned, in sections, to the module's other signal path. There are 16 aux sends, of which eight may be addressed in pairs at one time. Pricing for the Galileo starts at $177,327 for the 40-channel model and rises to $277,065 for the 56-input version with Supermove automation.

The **Rembrandt** is a dual-path console available in 40- and 56-input frame sizes and is supplied with Supertrue VCA automation, Amek Recall, Amek Virtual Dynamics and Amek Visual FX. As on the Galileo, input modules contain two 4-band sweepable EQ sections for channel and mix signal paths, effectively doubling the number of inputs for mixdown. There are 16 aux and 24 routing buses. Pricing for the Rembrandt starts at $99,153 for a 24-input model in the 40-input frame. A 56-input configuration starts at $146,895. Prices include patchbay and stand.

The new **Angela II** is a lower-cost dual path production console. The 40-channel version provides 80 inputs, each with 4-band EQ and automated

fader and mute. The console has eight aux buses, 24 routing buses and includes a jackfield. The console is supplied with the Supertrue VCA automation system, which includes Amek Virtual Dynamics and Amek Visual FX programs, all of which reside on a Pentium computer, supplied with a 14-inch color monitor. The standard model is $74,750.

AMS Neve Capricorn

AMS NEVE

The Logic 2 by AMS Neve (Burnley, UK) is a large-scale automated digital recording system that integrates a fully featured mixing console with an AMS AudioFile. Like other digital consoles, the Logic 2 is highly flexible and may be configured in a number of ways for recording, post and film applications. Up to 60 channel strips with four-layer operation provide 240 fully equipped mono/stereo channels plus as many as 48 aux and 64 multitrack record buses. Featuring a 32-bit all-digital signal path, the Logic 2's signal processing resources are determined more by available digital processing horsepower than input strip layout; EQ is 4-band with 2-band filtering and full dynamics on each channel. Many complex functions may be assigned and controlled at a central control panel. Among the Logic 2's many notable features are total dynamic mix automation plus setup recall automation, comprehensive machine control, moving faders, 32-bit DSP and a relatively compact profile. Contact manufacturer for pricing.

The **Capricorn** is Neve's flagship digital console. Three standard 48-track recording configurations are offered, but a wide degree of customization is possible—the console is to some extent

modular and may be expanded in 24-channel increments to its upper limit of 256 signal paths. A typical configuration, the System 112, offers 32 mic/line inputs, 24 AES/EBU stereo digital inputs and outputs, 48 track sends, 64 track returns, 16 auxiliaries and eight cues. Signal processing is selected and assigned via a screen and trackball, and selected parameters are controlled through multipurpose rotary controls. The Capricorn thus provides enough tactile controls for quick seize-and-twist operation without hopelessly cluttering the control surface with dedicated switches and pots. Contact manufacturer for pricing.

The Neve **VR Legend** is a large-architecture analog console with a fully discrete control surface and is available in recording, post and film-scoring configurations. Including all of the channel features of the V Series consoles, the VR Legend offers assignable Neve Format Spectrum EQ, eight aux buses, and full 48-track routing plus 48 additional sends. Metering is VU or PPM, and discrete dynamics metering is available for each channel. Flying Fader and Recall automation packages are optional, as is Neve's Encore automation system, a Windows NT-based system, which provides consistent automation functionality and interface for all Neve consoles. Contact manufacturer for pricing.

ANATECH

The **VCM-32** from Anatech Systems Ltd. (Cambridge, UK), a division of Martinsound Inc. (Alhambra, CA) is a 32-input, 24-bus in-line console for recording and broadcast (the console is also available in 48-channel and larger formats). The first product from a new company, the VCM-32 is based on a design philosophy that emphasizes ergonomics, flexibility, extensively auditioned electronic design and value for money. The VCM-32 features dual-path input modules for a total of 64 inputs at mixdown, and there are 24 multitrack buses, which are assigned via individual switches. Both mix and monitor signal paths are equipped with automatable 100mm faders, and there is an integral compressor/gate on every channel. EQ is 4-band parametric, switchable between mix and monitor signal paths, and a separate filter section may be inserted in either path or the dynamics sidechain. Twelve aux buses may be used in vari-

ous configurations; the first eight aux sends are normaled as four stereo cue buses. Master control and monitor select functions are comprehensive, and there are two programmable mute circuits. Price is $75,000 for the base model, $93,000 including Audiomate moving fader automation.

API

The API (Wheaton, Ill.) **Legacy** is an all-discrete, fully modular console designed with functionality and transparent operation in mind. The board is based on a vintage '70s design, both in appearance and in circuit design. Each channel strip is made up of sections rather than solid, one-piece input strips, and a modular frame design allows expansion of channel buckets and multi-
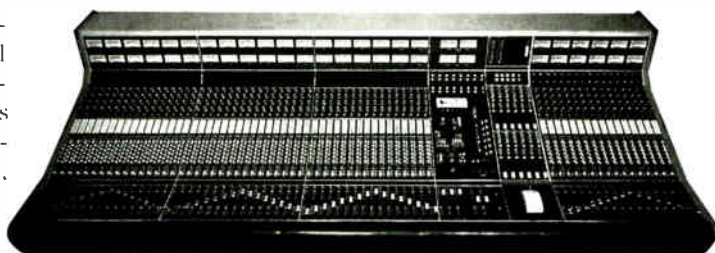
API Legacy Series

track monitor sections. The standard channel input strip is made up of preamp, EQ, input and fader modules; signal processing modules can be added later, and the channel strip can be specified without preamp/EQ modules, providing a cleaner signal path to tape and a cost savings. Many modules are compatible with API's modular rackmount systems.

The channel input module (model 768) directs signal routing functions, including bus assignment, aux and cue sends, pan, solo, mute and mic/line switch. The signal path is a discrete op-amp circuit. The mic preamp module is API's model 212L, the all-discrete, op-amp circuit used in the vintage API 512b preamp. The 550 EQ module is a simple, passive-filter design, offering four bands, with API's proprietary Proportional Q, which varies bandwidth proportional to boost/cut. Monitor options include split or in-line formats. The standard monitor module configuration consists of the 868 monitor module and a separate fader module, which is wired for automation and fitted with a P&G fader. A center master controller section includes bus trims, aux send trims, mix bus matrix, peak reference, master solos, talkback, cuts and dim, 11-frequency oscillator, cue

masters, talkback and meter select.

The Legacy series is available in various frame sizes, based on a 16-channel input section and a 24- or 48-channel monitor section. Prices start at around $100,000.

D&R

The **Cinemix** from Dutch manufacturer D&R (Weesp, Holland) is a customizeable recording, film and post-production sound console available in 32- and 48-input frame sizes, with 816-point patchbays. Notable features include dual signal path input modules with duplication of almost all features, 360-degree LCR, Front/Rear panners, two automated VCA (standard) or motorized faders per channel, comprehensive routing and automation features including assignability to automated 6-channel joysticks, and optional dynamics on both signal paths. ARM routing matrix allows preset and recall of routing and switching. The dual input channel architecture offers 96 mono inputs for mixdown on the 48-input console; all models feature ten stereo effects return channels. EQ for both sections of the input module is 4-band sweepable. The ten discrete aux sends may be routed to up to 34 aux send buses at mixdown. The six-output (LCR, Surround L, Surround R, Sub bass) monitor section is under digital control, allowing for preset and recall of listening levels appropriate to the various film sound playback formats. Prices start at $44,422 for a 24-input Cinemix and rise to $68,358 for a 48-input configuration.

The **Merlin** recording, mixing and post-production sound console is available in two frame sizes, 40- and 56-input, with a standard patchbay, though D&R will customize to suit clients' requirements. Each dual input module offers two 4-band EQ sections. The mix path also features variable Q in the mids and a highpass filter. Both signal paths feature comprehensive automation including 100mm automated faders and six automated switch functions. The 12 discrete aux sends may be routed to up to 36 aux send buses at mixdown. D&R's PowerVCA Automation package for the PC is supplied standard, and VCAs can be switched out of the signal path while retaining full fader control. Motor faders are optional. ARM automation provides instant recall of all digitally controlled signal routing and switching functions. Metering is 25-segment bar

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EUPHONIX

The **CS2000** from Euphonix (Palo Alto, Calif.) is a highly modular, digitally controlled analog console available in a variety of configurations for different applications. The CS2000's audio electronics are housed in a remote Audio Tower that connects via serial links to the MixController. The Digital Studio Control (DSC™) module

is a central assignable control surface that combines with a digital control surface that is expandable from eight to 104 faders, from four to 52 sends, up to 120 dynamics channels and from one to three operators. The DSC provides access to channel functions, such as EQ, dynamics, surround panning, channel routing, snapshots, master control facilities, automation, aux sends and machine control. An active-matrix color screen displays signal routing and processing parameters. Each channel has two universal input (mic/line) amplifiers and four fixed-input gain line inputs; either channel fader can accept any of these six in-

puts, and either fader functions as either a mono or stereo fader. All signal processing is centrally adjusted from an assignable rotary control set. Automation includes SnapShot Recall™, which resets all functions in less than 1/30 second; SnapShot Automation™, which fires SnapShots at cue points or timecode locations as part of an automated mix; and dynamic automation of two faders, two mutes, two panpots and four aux sends per channel.

Although many CS2000 system configurations can be created by combining different options, Euphonix offers custom systems targeted to specific applications. The **CS2000D** is the basic system, fitted with 24 multitrack buses, the Digital Studio Controller (DSC) with color display and both SnapShot Recall and Total Automation systems. The **CS2000M**, configured for music recording, includes the Euphonix ES108A dynamics processor, DSC and 16 aux sends per channel, expandable to 48. The **CS2000B** is designed for television broadcast and production applications, with SnapShot Recall, 12 mix-minus buses (expandable up to 48), six stereo subgroups and surround mix capability. Optional are redundant power supplies and crosspoint audio router/switchers. The **CS2000P** is aimed at television post, and is configured with SnapShot automation and 12 mono/stereo mix buses per fader (ideal for stereo mix stems). The **CS2000F** is designed for surround sound re-recording, featuring Euphonix's new surround panning software with 12 (expandable to 48) multi-format mix buses per fader. These buses can be configured as single or multiple film mix stems; the system also accommodates an optional PicMix system for various surround monitoring formats. Multi-operator systems are also available. Pricing for the CS2000 system starts at around $100,000.

FOCUSRITE

The Focusrite Studio Console, or **F2**, by Focusrite (Bourne End, UK) features neither a traditional split nor an in-line design, but is instead what Focusrite terms an "all input" console—each module can serve as an input or tape return. Modules do not therefore include a small fader and separate monitor chain, as is typical for in-line designs. The F2's no-compromise electronic design revolves around simplicity and high quality, and the console is entirely FET-free. Local bus summing ensures that large-format consoles maintain low bus noise. Available con-

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figurations are multiples of eight, with a maximum of 96 channels feeding 24 or 48 multitrack buses. The center control section is 12 inputs wide. The input module is based on the renowned Focusrite ISA 110 equalizer and features 4-band EQ with two bands parametric, and high- and lowpass filters. Features include 12 aux buses, two stereo cue buses, and three stereo mix buses in addition to the multitrack recording buses. Optional modules include stereo line return modules and stereo compressor/gates. Automation is third-party, with GML's moving fader system preferred. Contact manufacturer for pricing.

HARRISON

Harrison (Brentwood, Tenn.) offers a range of 24-bus (and above) consoles for various studio applications. The SeriesTwelve/MPC is Harrison's flagship console system, available in any configuration of analog or digital I/O, including hybrid combinations. Based on common audio processing hardware, the MPC desk interface is designed for film re-recording, while the Series-Twelve desk offers user-customizable configurations for film, broadcast, post-production and music recording/mixing. Both systems are available in frame sizes from 24-input to more than 300-input configurations and offer a Mac-based full automation (both snapshot and real-time dynamic) system. Also available is an automated joystick for surround panning. The control surface is designed for flexibility in configuration to control as many as 244 audio channels, either analog or digital. The Traditional control surface has the look and feel of a traditional large-scale mixing console, with familiar channel controls and large and small faders. The layered control surface allows a single input strip to control up to four different audio channels; layering may be switched locally or globally. An Assignable control surface is also offered. Contact manufacturer for pricing.

The **TV950** is available in up to a 64-position frame and is designed to be customizable for use in both television and post-production applications, as well as in music recording, with multitrack buses available in up to 24-bus configurations. Inputs may be specified as mono mic/line, stereo line or dual stereo group modules; other available modules include program master, communication, control room, studio monitor, mix minus, master tally, group fader, program output, cinema switch-

ing/monitoring and film panning. Contact manufacturer for pricing.

The **Series-3** and **Series-4** consoles are both available in either TV (television) or MR (music recording) configurations. The Series-4 offers VCA fader and group fader automation and is available in either 24- or 48-bus formats. The Series-3 offers VCA fader automation and is available in a 24-bus configuration. Contact manufacturer for pricing.

Harrison SeriesTwelve

LAFONT

The Lafont **Chroma** (distributed by Sascom Marketing in Toronto) is an analog console geared toward post-production applications. Circuit topology is an in-line design, configured for high-speed use in mix-to-picture and multiformat film/video post. Two standard frame sizes are available, the Chroma 40 and the Chroma 64, expandable in 12-channel buckets.

The Chroma accommodates any combination of dual-line input modules equipped with gates or compressors, or mic input modules with built-in mic preamps and compressor functions. EQs are 4-band with sweep highs and lows and parametric mids; the EQ can be inserted into either the channel or monitor path. Each module features 4-channel LCRS panning with six-way surround monitoring. Two busing configurations are available, a conventional stereo Mix mode and Surround mode; in Mix mode, access to the 24 multitrack or submix buses is via a bank of 12 buttons, linked to a pan control that operates between odd/even buses. In Surround mode, the channel pan operates with true LCR pan laws, while the monitor pan controls front/back balances. The integrated TT patchbay provides insert points for surround encoders, or enables the console to interface directly to DTS and SR·D mastering systems. A master bus/tape switcher panel enables arrays of I/O modules to be assigned to one of three master groups, then flipped between bus sources and off-tape relay as a multichannel/multistem mix is being made.

The console is supplied with Optifile Tetra VCA-based automation that controls channel faders and mutes; optional are Uptown, Flying Faders or GML moving fader automation systems. Prices for the Chroma line range from $85,000 to about $185,000.

MALCOLM TOFT ASSOCIATES

MTA (Ash, UK) offers the Series 980, 900 and 990 large format consoles, all of which are based around four different module types. The 980 and 900 series have input or channel modules, group master modules, line-level effects return modules and a master module. The 990 drops the group output module and adds a stereo bus master module for three additional stereo mix buses.

The MTA **Series 980** is a split design available in 32-, 40-, 48- and 56-input frame sizes; Mosses and Mitchell patchbays and P&G faders are standard. The 980 features 4-band EQ on all inputs and monitor and line-level returns. This results in 62 equalizable channels available at mixdown on the 32-input console, 70 inputs for the 40-input configuration. Input modules offer 24-bus routing in pairs (panpot always in circuit) and a second line input that may be routed direct to the remix groups; there are eight aux buses. EQ is 4-band sweepable with overlapping ranges and a switchable highpass filter. Three mute switches allow for three separate mute programs. P&G faders are standard; most VCA and moving fader systems can be fitted.

Monitor modules combine monitoring facilities for two output groups, each provided with 4-band EQ. Three echo return modules are provided, each containing two line-level return modules with 4-band EQ and aux sends. The single master module contains aux bus send masters, oscillator, studio and control room monitor controls, mute group masters and talkback. Prices range from $50,000 for a 32/24 to $80,000 for a 54 24.

The MTA **Series 900** is a split design available in 32-, 40- and 48-input frame sizes, with or without Mosses and Mitchell patchbays and P&G faders. Essentially a lower-cost version of the 980, the 900 shares the same architecture and similar modules but drops a few features. For example, channel EQ is 4-band sweepable, as on the 980, but monitor module and effects return EQ is two band. AFL, PFL and Solo facilities are provided, but there is only one programmable mute circuit. Third-party automation packages can be supplied by MTA or retrofitted. Prices are $32,500 for a 32/24, $48,500 for a 48/24 with patchbay.

The MTA **Series 990** is what the company describes as a "Virtual Split" design; the monitor sections are located above the inputs, combining the compactness of an in-line console with a split topography. The 990 is available in 32-, 40-, 48- and 56-input frame sizes, with Mosses and Mitchell patchbays and P&G faders supplied as standard. Channel EQ is 4-band sweepable with a highpass filter, and may be switched into the monitor/group output path. The channel provides three stereo sends to the eight aux buses, switch-

able to mono and pre- or post-fader. The stereo effects return modules have 4-band switchable EQ with a highpass filter. As with the 980 and 900 Series, various automation packages can be supplied by MTA or retrofitted. Prices start at $55,000 for a 32-input, 24 group, 32 monitor console. A 56-input, 24 group, 56 monitor configuration costs $81,000.

NEOTEK

The Élite console system from Neotek (Chicago, Ill.) is designed for music recording, broadcast and post applications. It offers 24 multitrack buses, two stereo buses and 32 aux buses; frame sizes accommodate 32 to 64 inputs. Signal routing features include Neotek's Dual Channel Architecture, with two discrete audio paths per input module, which are controlled by separate channel faders and operate independently, in parallel or in series. The channel highpass filter, patchbay insert point and 4-band parametric EQ may be independently assigned to either path for further flexibility, and channel output signals can be routed to the multitrack buses, which include a second stereo bus, or to the main stereo mix bus

through a logic-controlled mute function. A single switch reverses these two delegations, effectively doubling the number of configuration options. The Élite accommodates most VCA and moving fader automation systems. Neotek also offers VCA faders and MIDI Direct mute automation.

An optional fader module for broadcast applications produces a fader start pulse, mutes studio or control room speakers and accepts mute remote commands. Also offered is a new Multimedia module based on design features of Neotek's Encore and Essence film consoles. The module provides a full set of features for monitoring in a multichannel environment, such as LCRS or 5.1 channel formats; features include volume, mute and dim for three-speaker systems with up to six loudspeakers; reference monitoring of encoded and mono-encoded signals; and the capability to insert an encode/decode processor. Prices for the Élite start at $44,000 for a 32-input configuration; a 64-input model is $79,000.

Neotek's **Élan** series is a scaled-down version of the Elite, designed mainly for use in project and artist-oriented studio applications. The Élan is

designed with the same components, quality frame and interconnect system as the Elite, but the architecture is pared down, with simplified equalizers and meters, reduced frame sizes and a smaller list of order options. It offers 24 multitrack buses, 4-band sweep EQ, in-place solo and up to 30 auxiliary buses; its architecture doubles the number of inputs when mixing. Prices start at around $27,500 for 32-inputs.

ORAM PROFESSIONAL AUDIO
Sold direct in North America by Pelonis Sound and Acoustics (Santa Barbara, Calif.) the **British Equalisation Series** consoles from Oram Professional Audio (Gravesend, UK) come in 24-, 32-, and 40-input standard configurations (custom configurations are available). Created by veteran designer John Oram, the BEQ Series consoles feature a non-dedicated split topology that allows unused submaster outputs to function as additional inputs. Thus a 32-input console can actually mix down 96 inputs. Oram's extensive use of surface-mount technology and robotics in manufacturing the BEQ Series has resulted in significant cost and performance benefits. High electronic packaging densities allow potential sources of hum and crosstalk to be widely separated on input strips, and crosstalk between adjacent channels and groups is 80 dB @ 1kHz. The BEQ Series also features ten aux sends per channel, and a master aux matrix allows for 30 discrete aux sends. Prices are $28,000 for the 24-input model, $34,500 for the 32-input, $44,000 for the 40-input. Larger configurations are priced accordingly.

OTARI
The **Concept I** from Otari (Foster City, Calif.) is a digitally controlled analog console, geared toward music recording and video and film post-production applications. The system has a traditional interface, available in frame sizes accommodating 32, 40 or 48 channel modules, plus a master module and integrated patchbay. At the heart of the system is the central CCS (Concept Control System), which digitally controls signal routing, switching functions, snapshots, automation and other console parameters like grouping functions, SoftKeys and channel function parameters. These functions are accessed by the centrally located Digital Master Module (DMM), which controls all module routing functions. Each channel has two separate inputs, and features two 100mm long-throw faders

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Otari Concept 1

and two 4-band EQs. Fader and mute automation is standard. Stereo modules, dynamics and mute automation are available. Prices for the Concept I start in the mid-$50,000 range.

Otari recently debuted the **Concept Elite**, which is based on the Concept I but integrates a host of refinements and a set of advanced functions. The Elite features Otari's Image Recall™ system, which stores and recalls mono input module parameters, such as EQ, pan, fader and switch settings, at the touch

of a button. Each module includes two enhanced 4-band channel EQs (one for the mix path and one for the channel path), with swept highs and lows and fully parametric mid-bands, and low- and highpass filters on the mix path. A new, symmetrical console frame layout allows for customized placement of the patchbay and Digital Master Module. The Elite also features Otari's new M•Pan™ multiformat panning option, which facilitates panning and assignment for multichannel film formats by providing simultaneous dual path assignment to track buses and two-through five-way panning via local pan pots or automated joystick surround panners. The Concept Elite is priced from the mid-$70,000 range.

The Otari PicMix™ surround monitoring and panning system, which accommodates all surround formats, can be ordered as an integral part of either console.

OVER QUALITY

The **OQM 8100** from Over Quality (distributed by GML in Van Nuys, Calif.) is an analog console designed for superior audio quality regardless of configuration. The console operates all audio

inputs at line level and sums all signals at line level, to improve quality of source to destination and to eliminate crosstalk. A remote mic amp generates line-level outputs for minimum loss. Console input and monitor paths are combined in the same module, and circuits feature ADgear discrete op-amps in all audio paths.

Channel signal processing features include a compressor/limiter, expander/gate and 4-band EQ with shelving high and low bands and parametric mids. In addition, channel strips feature high- and lowpass filters, aux and bus sends, sends to stereo buses, and selection of two cut groups. The master section features all of the usual controls, including levels for six auxes plus an L/R aux, three solo modes (AFL, PFL and Cut Solo) and controls for optional remote control cue box channel cut. Meters are a combination Peak/VU/32-point bar graph system. Starting price for the OQM 8100 is about $300,000 for a 32-input configuration with GML automation; a 72-input system with automation is around $550,000.

SOLID STATE LOGIC

The **Axiom** Digital Production System

by Solid State Logic (U.S. offices are in New York City) is a tapeless digital recording/mixing system available in frame sizes from 24- to 96-input configurations and is capable of recording up to 128 tracks on the DiskTrack™ hard disk system. Motorized faders and familiar channel strip controls suggest the appearance and feel of an analog console, yet the Axiom offers all of the signal processing and dynamics automation control one would expect from a state-of-the-art all-digital console. Exact routings and settings may be instantly recalled, digital resources may be shared among multiple rooms and consoles, and multiple digital and analog sources may be integrated and controlled; a variety of digital interfaces are available. Contact manufacturer for pricing.

The **9000 J Series** is an in-line analog console configurable to accommodate a maximum of 120 channel modules. SSL has redesigned the electronics throughout, eliminating electrolytic capacitors in favor of a DC-coupled design. The J Series automation computer has also been designed from the ground up and provides a sophisticated user interface, including a color monitor/pen and tablet combination, and a new version of Ultimation moving-fader automation and Total Recall, including automation of small faders. The SL 9000 EQ is 4-band parametric with variable Q on the mid bands and shelving/bell on the high and low bands with selectable E or G Series curves. The EQ section can be switched to the monitor path and/or the filters placed in the channel input. The J Series Dynamics section is based on G Series circuits, with the addition of a peak-detect option on the compressor, and a hold control for the gate.

Outputs include 48 multitrack buses, four stereo buses, a main LCRS bus (which is also available as an optional LCR panning configuration), plus eight aux buses that are configured as six mono effects sends and a stereo cue/foldback send. Scoring and Surround output options are available.

When the SL 9000 is equipped with DiskTrack, there are a maximum of 128 audio tracks of disk storage with access to up to 96 concurrent record/playback tracks. In addition to dynamic automation, the J Series computer also provides a total of 40 consolewide snapshots of all automated functions. SSL's familiar Total Recall records the position of all the switches and rotary controls in the console's channel modules, as well as the positions of controls within the center section. Contact manufacturer for pricing.

SONY

An all-digital console designed primarily for music production and post applications, the **OXF-R3** "Oxford" from Sony (Montvale, NJ) is a collaboration between Sony's research and development center in Atsugi, Japan, and Sony's Oxford Group in the UK. The hardware is based on a flexible, scalable digital signal processing system, and bus structure and processing capabilities are software-defined. Emphasis has been placed on A/D conversion precision, with Sony 20-bit converters; internal processing is 32-bit, using 24-bit data highways between digital I/O ports. The console can be configured with up to 120 analog or digital (AES/EBU, SDIF-2 and MADI) inputs, with up to 48 multitrack outs (96 optional), 24 aux send buses and 16 independent submix stereo outputs.

Color front panel LCDs show console functions, including EQ response curves, dynamics envelopes, multitrack routing and subgroup output assignments. Signal processing includes a 5-band, fully parametric EQ, and sidechain processors for gating, expansion, compression and limiting, which act simultaneously at the same point in the signal path. An optional multiformat monitor panel provides control for surround sound formats using up to eight channels.

A Session Management System manages the multiple audio channels within the assignable control surface and handles static and dynamic automation (including snapshot automation of EQ, dynamics and I/O routing), automation editing, project setup and notes, machine control and housekeeping functions. The OXF-R3 system starts at around $800,000 for a 120-input/48-fader configuration.

SOUNDCRAFT

The **3200** console from Soundcraft Electronics Ltd. (Borehamwood, UK) is a split design, 32-bus console available in 32/24 or 36/32 frame sizes. Designed for music recording, the 3200 can also be supplied with custom surround film monitoring for film dubbing and post applications. Bus assignment is via 32 separate push buttons for the multitrack buses and offers separate stereo bus assigns with pan for mixdown. The 3200 also features a noise gate on every channel, and 4-band fully parametric EQ on both input and group output modules. There are eight mono and two stereo aux sends. Various third party automation packages are available, including Audiomation Moving fader or Optifile VCA. The 3200 is available with LED or VU meter bridge options and a full patchbay. Prices range from $136,995 for a 32/24 with VU meters to $186,995 for a 36/32 with LEDs.

SOUNDTRACS

The **Jade** from Soundtracs (Epsom, UK) is an in-line 24-bus production console available in 24-, 32-, 40-, and 48-input versions. The Jade's proprietary 4-band parametric channel EQs are contoured to compensate for hearing nonlinearity at the extremes of the audio spectrum. Monitor modules have 2-band EQ, and flexible EQ assignment allows selective assignment of the parametric EQ to the monitor chain. Standard inputs include 12 aux sends and dual inputs for mixdown; additional module options include stereo line-level input modules and 4-channel effects returns modules. Assignable dynamics under VCA control is standard on channel inputs, and Jade automation offers fader and mute automation at 12-bit resolution. Prices range from $43,999 for a 24/24 without patchbay to $73,299 for a 48/24 with patchbay.

Solitaire is an in-line, 24-bus production console available in 24-, 32-, and 40-input versions. Features include 4-band swept EQ, eight aux sends per channel, four stereo effects returns, VCA or moving fader control of inputs and monitors, and optional dynamic processing. Prices range from $19,399 for a 24/24 without patchbay to $40,499 for a 40/32 with patchbay and VCAs.

STAGE TEC

Manufactured by Stage Tec of Berlin, but available in North America through QSC Audio Products (Costa Mesa, CA), **Cantus** is a fully automated, all-digital console capable of handling up to 480 inputs from a 7-foot-wide control surface. The latter is fiber-optically connected to any number of rackmount "base devices," where the actual DSP and audio signal flow takes place; each base provides up to 96 input channels and 64 mix buses. I/O options include any combination of analog mic/line sources and digtal formats: AES/EBU, S/PDIF, Yamaha Y2, SDIF-2 and MADI are all supported. Signal processing can be assigned at any point in the system, and includes EQ, delay, level change and pan.

The onboard system computer han-

Stage Tec Cantus

dles all SMPTE-driven automation functions (static and dynamic) with near-instantaneous (10 ms) recall of any console setup or snapshot; data is archived to magneto-optical media. A central machine panel provides control of two tape transports, with recorder-style transport keys and a jog/shuttle wheel. Moving fader automation is standard.

Cantus can also be combined with optional DARIS (Digital Audio Routing and Interconnect System) signal routing/matrixing/distribution devices, which can form the basis of a large decentralized, multi-studio system, or used in situations where multiple feeds need to be routed to various consoles i.e., broadcast mixers, recording mixers and sound reinforcement mixers. Obviously, Cantus pricing depends on configurations and application needs, especially as it can handle large systems with 400-plus inputs and more than 300 mix buses.

STUDER PROFESSIONAL AUDIO

Studer (Zurich, Switzerland) is delivering its first digital mixing console, the **D940**. The D940 console is fully automated and features up to 64 buses for

Studer 940

use as multitrack sends, groups, masters, etc., in any combination. Dual input layered architecture and a high degree of modularity allows the console to be tailored to a variety of needs. For example, channel functions can be operated from the channel strip itself and/or from an assignable central area, enabling the operator to manipulate signals at the channel, at the central approach or both. An integrated DSP routing matrix enables extremely flexible audio routing, avoiding the need for an external mechanical patchbay. Price for the D940 starts at $500,000.

TACTILE TECHNOLOGY

Tactile Technology (Cerritos, Calif.) offers the M4000, a fully automated mixing system. The M4000 digitally controls analog circuit elements housed in modular rackspace units, via an assignable hardware controller. Input channels provide access to 24 dual-input signal paths, for a possible total of 240 channels. Output modules can be combined to provide a possible total of 30 aux sends and 40 output buses. A disk drive loads system updates and snapshot automation setups; dynamic automation systems have a 250MB hard drive.

The M4000's assignable control surface has a bank of 24 upper and 24 lower channel faders strips, eight group faders, master monitor and two mix output faders. Above the bank of group faders is a 320x64-pixel LCD screen that provides channel status with routing assignments; EQ, pan and fader parameters; SMPTE timecode, etc. This information can be displayed on external monitors via a video interface option. Other features include 3-band input strip EQs, assignable to either input or monitor signal; and individual assignable scene crossfade times.

Complete automation includes instant recall snapshot/scene automation of all routing, level and EQ functions. Other automation features include merge and undo functions, and the ability to write and read fader and

scene automation either discretely or together, depending on the application. An optional Fader Link module ties event controllers (relays and TTLs) and MIDI program scene changes to the fader automation. A 24-bus M4000 system costs about $55,000.

TASCAM

The **M-5000** from Tascam (Montebello, Calif.) is designed for optimal performance in post-production environments. The console starts at under $30,000, and has a 40-input chassis, integrated patchbay and ships with 32 I/O modules, expandable by adding single modules, an 8-channel expansion kit, or by optional stereo modules.

Each channel incorporates two separate signal paths: The channel path accommodates mic/line input and the monitor path accommodates tape returns. The M-5000 features a dual-linear channel fader design, factory-setup for "mixdown" configuration—long-throw faders are normaled to monitor tape returns, and the small-throw fader is normaled to channel input. Channel EQs are made up of two shelving bands for both monitor and channel inputs, and two sweepable bands, each assignable to the monitor or channel path.

Tascam M-5000

The master module has standard features such as monitor and communications controls, aux masters (with AFL modes), selectable meter input, oscillator etc. and also features three mute groups. Tascam also offers a VCA-based channel fader and mute automation package ($9,999) with Macintosh software.

TL AUDIO

The TL Audio (distributed by Sascom Marketing of Toronto) Classic 1000 is a console geared towards music recording. It is designed to combine classic design with modern flexibility, and offers a combination of tube, discrete

A MIXER MADE FOR RECORDING AT A RECORD PRICE.

Class A transistor and IC technologies. The Classic 1000 is a modular design, built around 8-channel buckets, and is available in either split or in-line format, or a combination of the two. Module types (tube/discrete/IC) may also be mixed, or the entire console can be based on a single technology.

Input channels are in-line designs and come in two sections, one containing a preamp/EQ section, the other containing aux sends. The console may be ordered with the preamp/EQ at the top of the channel, or the auxes. All modules may be ordered in any circuit type, but the IC channels feature a noise gate and a second line input. In addition, the IC EQ is a fully parametric 4-band design, while the valve and discrete EQs are 4-band fixed with four turnover frequencies per band. All three EQs are split.

Optional Group-Monitor modules required for split operation are dual-channel designs; the modules may also be used as subgroups and to provide additional inputs. Like the in-line channels, the Group-Monitors are also available in the three technologies. Two additional modules are presently under development for the console—a stereo input module and dual mic-line input module. The console is also fully equipped for Recall, and faders are ready for retrofit of third-party moving-fader/VCA automation. The Classic 1000 system starts at about $60,000. Also available from TL Audio is the **Classic Gold** series, which is a scaled down, lower-cost version of the Classic 1000 that starts around $35,000.

TRIDENT AUDIO DEVELOPMENTS

The **Ventura 85**, the latest console from Trident (U.S. offices in Nashville), is designed as a replacement for the Series 80 model, which has been in production since 1980. The split design Ventura is available in 32/24/2, 40/24/2 and 48/24/2 frame sizes. Features include bar graph metering, two line inputs per channel (both of which may be mixed into the input channel simultaneously), variable high- and lowpass filters, 4-band EQ with switchable Q, eight auxiliary buses, and two automute control buses. Pricing starts at $49,950.

The **Trident 90** is an in-line console, available in 40- and 56-input frame sizes, but can accommodate as many as 128 or 176 line-level inputs due to the dual line inputs on every channel. Each

Trident 90

signal path has its own EQ, auxiliary send controls, automated mute, level and pan control and routing to the stereo and 24 multitrack buses. Bar graph metering is standard. Trimix automation controls both channel and monitor fader levels—both VCA and moving faders are available—and offers comprehensive dynamics control, including two compressor/limiter/noise gates per channel. Individual channel and monitor path compressor/limiters are set up from a central panel, and parameters are displayed on the automation system's monitor. Automation can also control up to 12 switches per channel and associated master switches. Extensive machine control is provided as standard. Pricing starts at $115,000, including Trimix automation.

The **Vector** is an in-line console suitable for recording, broadcast and post and film applications and is available in 40-, 48-, 56-, 64- and 72-input frame sizes and a variety of configurations. Featuring 32 multitrack buses, four stereo buses and eight auxiliary buses, the Vector may be supplied with almost any combination of the four different input modules—mono and stereo input modules; a four-element dynamics module; and a three-section FX return module. Channel EQ (which may be switched into the monitor path) is 4-band parametric. A comprehensive center control section contains a master stereo bus compressor and controls and indicators for studio playback, aux masters, monitoring, talkback, metering, and oscillator functions. An integrated QWERTY keyboard is also supplied for the optional fader automation and/or multiple machine control. Automation and machine status are displayed separately. Pricing starts at $120,350 for a 40/32 and $173,150 for a 40/32 with Trimix automation. ∎

NASHVILLE CROSSROADS

The city of Nashville has the world's highest per capita ratio of churches and recording studios, and lately, it has seen the latter outpace the former. Studios of all sizes have sprung up in the past five years, from small bedrooms to mega-facilities.

Personal recording setups have multiplied the fastest; more songwriters—and they are the largest single block of clients in Nashville—are turning to personal recording technology for demos. The phrase "eaten from below by ADATs" has become a common refrain among commercial studio owners, for whom songwriter demos were historically a reliable way to fill in the time between record bookings.

Still, new major capital studio investments continue at a dizzying pace. The trend started about four years ago with the refurbishment of several top facilities, such as the redesign and upgrade at Woodland, which became Woodland Digital. It is just hitting its peak now, as three major facilities upgraded within just a few months of each other: Masterfonics' $3-million, Tom Hidley-designed Tracking Room in November; MOR Music's estimated $17-million audio/video facility on Dickerson Road in January; and Starstruck (Reba McEntire) Entertainment's new Harris Grant-designed, two-room facility on the Row in April. Several other potentially significant facilities are in progress, including the three-year joint effort by Allen Sides and Gary Belz to build a studio in the old Tony Alamo church on the Row, former Petra keyboardist Jon

Lowry's new studio near Franklin, and Cool Springs Recording.

However, before any envy sets in, consider that this comes at a time when the 1995 market share of country music—the lifeblood of Nashville—is at 16.7%, according to RIAA statistics, well below the high-water mark of 18.7% in 1993, the apex of the boom that helped fuel the studio expansion trend. Overall unit sales of prerecorded music are down nearly 1%; country sales specifically are up .04% but on relatively flat dollar sales. And major country labels—which, after all, are one of the sources for the RIAA's figures—have cut some project budgets and limited new signings over the last 18 months. This is on top of a chronically anemic rate structure that has resulted in another first for Nashville: an organization of studio owners and managers who are finding that their common economic concerns outweigh their competitiveness.

This explosive proliferation of studios under these circumstances offers a snapshot of a city, and even the entire entertainment industry, in flux.

A LITTLE BACKGROUND MUSIC

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Art + Science = Magic

Owen Bradley took over the country divisions of RCA and Columbia in the mid-1950s—marking the transition from New York-based to Nashville-based home rule for its labels—country records were still regularly being made as far afield as Cincinnati and Dallas. Castle Studio, located in a downtown hotel, was the city's only real urban facility into the early 1950s. It wasn't until Bradley opened Quonset Hut (which became Columbia Studios) and RCA opened its own facility that Nashville got a serious studio base.

The growth of that studio base came about mainly through independent studios, such as Norbert Putnam's Quad Recording, which started in 1970. The designs of many Nashville studios of the '60s and '70s reflected the questionable acoustic philosophies that were widespread at the time (i.e., dead rooms), but Nashville's facilities stuck with that approach long after Los Angeles and New York had moved on to large, ambient spaces. For one thing, country's market share was still relatively low, although occasional spikes brought it forward in the national consciousness—Glen Campbell's or Kenny Rogers' or even Johnny Cash's radio crossovers and television shows. But those crossover records were often done in Los Angeles, where producers felt they could get a better shot at pop radio and the pop sales market with more modern studios and what they regarded as hipper players.

What moved Nashville studios off the dime in the 1980s was an influx of new blood, mostly from California. Producers with pop credits, most notably Jimmy Bowen and Jim Ed Norman, came to Nashville to head the country divisions of Capitol Records and Warner Bros., respectively, and their technical requirements migrated with them. Mitsubishi ProDigi quickly became the digital format of choice as a new generation of facilities sprang up. But early acceptance of digital (facilities faced an expensive changeover in replacing the multitracks with the now-standard DASH format) and a plethora of new studios positioned Nashville well to address the skyrocketing country sales of 1989-1993—country's most profitable period ever.

The owners of those studios initially saw themselves protected against the onslaught of home recording that was affecting the Los Angeles and New York studio communities for two reasons: The low-end user base in Nashville developed late in part be-

cause A&R people still preferred live sessions, even for demos; and the lag time for revenues from the sales boom delayed the entry of many would-be home recordists into the market. But by 1994, both of those conditions had changed, and home studios mushroomed throughout the Nashville area. Project studios came on top of a steady influx of L.A. refugees (at one point in 1994, as many as 750 California driver's licenses per month were being converted to Tennessee licenses in Davidson County alone, according to one broad-

cast report), who brought personal studios with them. The larger studios began to be affected by home recording just as country's sales began to level off, and country labels (which numbered more than 20 by then) reacted by curtailing signings and cutting record and video budgets.
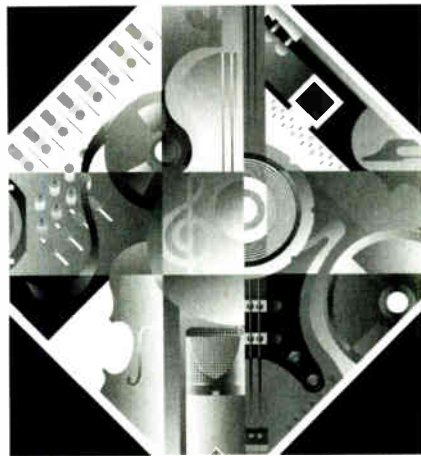
The competition was tighter than ever, and rates were static, thanks to downward pressure from labels, personal recording and the laws of supply and demand. Then, within the last six months, Nashville saw the arrival of three large new rooms that had been in the planning stages for as much as a year—The Tracking Room and two studios at Starstruck. Other studios felt pressure to upgrade: Recording Arts bought an SSL G Plus, and Sound Stage ordered its own SSL 9000J in the beginning of 1995; Sound Kitchen installed a new Neve VR and planned for a new tracking room. And several new mid-sized studios came on the scene, including Seventeen Grand and October Studios.

CROSSROADS

That brings us to the current situation: more studios, better studios, higher capital investment aimed at attracting more non-Nashville clients. At the same

time, though, rates have not changed significantly in the past five years. The players in Nashville's studio drama range from Pollyanna optimists to self-styled realists; all are hopeful about the future but unsure whether the current cycle of upgrades and expansion will be their salvation or lead to their own demise.

General manager of Emerald Recording, Milan Bogdan, who has chosen to defer technological and physical expansion and concentrate instead on adding ancillary businesses such as satellite uplink/downlink and independent marketing services, says the current round of expansion is "premature, mistimed and based in part on egos. It's not just new studios or boards that [non-Nashville clients] want, but new attitudes. I've had a number of out-of-town artists, engineers and producers coming through here recently to check out Emerald and Nashville. And I'm finding that it's how we reflect our image to them that's as important as anything else. We have to show them that we're willing to accept and accommodate non-country music. This place can still be the music Mecca of the world, but we have to do more than just put in new rooms."

Bogdan believes that the addition of new rooms will spur a shakeout as their added capacity causes a further drop in rates. "I'm seeing the effects already," he says. "Even though we're booked well in the short term, I notice fewer clients booking as far out as they used to. There are more last-minute sessions. It tells me that people are shopping studios more and more based on price. I know that's going to cost me five to ten major sessions I would otherwise have had. That's why our response is to diversify, to ride this out." Simply having more clients in Nashville from out of town isn't enough, he stresses. "The new clients come to town already having been through rate wars elsewhere. They know how to negotiate, as do the production assistants in Nashville, who are doing an increasing amount of negotiating for the producers and putting pressure on us to lower rates."

The Nashville production assistants themselves—for the most part a handful of independent contractors whose fees are performance-based (See the July '95 *Mix*)—deny that they have a negative effect on rates. "Certain producers always get a certain rate at certain studios because they do most of their work there," says Kelly Giedt,

owner of Personalized Production Assistance, which performs studio bookings, musician scheduling and clerical work for producers including Clive Brooks and Harry Stinson. In addition, Giedt says, a range of rates for the same room, depending upon whether the same producer brings in a demo, a development project or a major label master project, is not unusual. "If it's a master, then the studio almost always gets full rate," she says.

Lauren Koch, who performs similar services for producers Emory Gordy and Josh Leo, says she is willing to pay card rates "95 percent of the time," although she notes that not all production assistants feel the same. Most of the others feel it's part of their job to negotiate the rates down, she says. "I see my job as getting the project done within the budget. It's not a swap meet," Koch says she can justify paying card rates by insisting that the studio provide all-inclusive services. "I'll pay $2,500 for The Tracking Room, but I won't pay for setup time or a 48-track machine," she explains. Koch also adds that she's concerned about the ability of the current music market to support studio expansion in Nashville. "I'm definitely concerned," she says. "People have been talking about music projects coming in from outside Nashville for a long time, but it has yet to materialize in a way that will really significantly support the studios to the degree they need it now—especially the studios in the middle; they tend to get hurt the most."

Recording Arts owner Carl Tatz says that in addition to flat sales, shortened radio playlists are putting the screws on country budgets. "And I personally don't see out-of-town business playing that big a role here," he says. "You can't count on it, and I don't know how you can nurture it." Tatz recently replaced his Soundcraft console with an SSL G Plus—not, he says, as part of a pack mentality but rather in response to a change from overdubs to mixing. "I was too specialized," he explains. "But there was an element of having to keep up with the neighbors, too. Basically, everyone is waiting to see what happens [in Nashville] after more studios like Reba's come online. If I have to, I'll drop rates to fill holes; everyone does that."

A more oblique perspective comes from Dominic Ambrosio, vice president in charge of production at the recently opened Speer Communications facility in the north part of town. This 110,000-square-foot facility has Speer Communications' MOR Music channel (a sort of Home Shopping Network music video channel, founded by Richard Speer, son of the HSN founder) and a local television station at its core. Speer installed eight online and offline video editing suites but just a single audio room, equipped with a Studer Dyaxis Post:Trio system. Considering that one of its core businesses is music video, and that the facility was built in the wake of Speer opening a country label, Magnatone Records, in town two years ago, why is there so little emphasis on audio? "It's a service we could get less expensively from the existing studios than from building our own," Ambrosio says flatly. "I don't know how many studios there are in Nashville, but I know there's a lot of them."

Dino Elefante, co-owner of Sound Kitchen with his contemporary Christian recording artist brother, Jon, agrees that the current level of non-country revenues coming into Nashville is not enough to warrant business expansion. "The idea of Mariah Carey coming to Nashville to track, that's a pipe dream," he says, adding that it may be the upper-level studios that are most at risk. "The $2,500-a-day places are going to have to compete against L.A. and New York; there's only a handful of clients in this town that can pay that rate," he says. Elefante says studios will have to establish more revenue sources, such as producer relationships (a common practice historically in Nashville) or in-house production and other ancillary services. A sizable chunk of Sound Kitchen's revenues come from the Elefante's Christian productions—enough to finance a new tracking room scheduled to open later this year, for which producer Michael Omartian (an L.A. transplant, like the Elefantes) will be an anchor client. "That's the wave of the future here, man," says Elefante. "You can't just get by with project-based [revenues]."

ON THE OTHER HAND...

Yet for every cautious comment there is an optimistic observation. Dave Cline, co-owner of Seventeen Grand Recording, which opened late last year on the site of the former Hummingbird (which itself reopened on another site), says everything going on in town is simply part of a regular cycle, and in this case the upgrade and expansions are positive in the long term for Nashville. "There may be some shakeout, but I think this will ultimately attract a new clientele to Nashville, like rock bands that will camp out at the larger tracking facilities," says Cline. "The thing to watch out for is that studios here are too quick to drop rates out of panic. They'd rather discount than have a few days open. I'd rather take those days and do maintenance. The [non-Nashville] clientele may only be growing at 5 to 10 percent a year, but over time, that's going to make a big difference. You have to look at it long-term, like the stock market."

Michael Koreiba, manager at Sound Stage, which put in an SSL 9000J earlier this year, says the studio was reacting to the wave of upgrades, particularly to the console installations at mid-level rooms. "We needed to continue to stay in the upper-level category," he says. "It's a scary time, but an exciting one, too."

Jozef Nuyens, owner of The Castle and the first president of the Nashville Association of Professional Recording Studios (incorporated in early 1996) is optimistic yet practical. "Rates are actually coming down, and there's not enough of a music base here to support the expansion," he acknowledges. "I'm expecting a mild bloodbath here in the next year-and-a-half. The reality is that new business isn't coming here in the force that's needed. That's the focal point of NAPRS; that's where we're going to try to make a difference. What we're trying to do is avoid the continuation of a blinding kind of euphoria here that's based on everyone seeing new labels opening up and thinking that that means more work. I don't see that happening unless we make it happen."

WATCHING THE UPPER LEVEL

The two facilities that everyone is eyeing are Masterfonics' The Tracking Room, which opened late last year, and Starstruck Entertainment, which was

scheduled to have a delayed opening sometime around July. Glenn Meadows, Masterfonics' owner, is decidedly optimistic about his and Nashville's future fortunes, citing non-country acts like the Beach Boys and Bad Company as recent clients, and the fact that so far country producers are accepting The Tracking Room's $2,500 daily rate. Meadows acknowledges that bookings in the room have mainly been short stints, with producers using it for a week or less for basic tracks, then moving on to less costly studios to finish. "But the rate structure here was designed all along based on that," he explains. "When we were under construction, the local record companies didn't understand that and reacted negatively. Now they see how to best use a studio like this, and they love it."

Meadows also points out that much of the expansion of existing studios in Nashville is financed by an already-amortized base; Masterfonics' own additions were largely collateralized by the studio's ownership of its assets. "We were leveraging off a paid-for operating base, and so are some others," he says. "Combine that with studios

that have in-house production revenues and new studios coming to town with a business base already in place, and the future doesn't look so bad at all." Agreeing with Seventeen Grand's Dave Cline, Meadows stresses that "Nashville studios have to hold the line in terms of rates and not keep making the same old back-door deals." And both Meadows and Sound Kitchen's Elefante emphasize the idea that, as a new generation of more savvy and powerful country artists mature, they will have more say about the facilities they record in, which the owners say bodes well for studios on the cutting edge.

Starstruck's facility, which will house the company's publishing, management and other offices, as well as two studios (Starstruck also operates a jet charter service), has been under construction on Music Row for more than a year. Despite the fact that Starstruck's management has kept a low profile on the facility, its presence has been a source of great speculation among area studio owners who wonder how much of the studio's time will be available for hire and what the rate structure will be. Studio manager Robert De La Garza would

not comment at press time, except to say that no rate structure had yet been determined. "Anything you hear on the street about what we'll be charging is simply hearsay and rumor," he says, adding that talk of Starstruck opening a film division is also unfounded. "I can tell you that the response to the studio in advance has been phenomenal from inside and outside Nashville."

Nashville's recording industry has undergone such rapid change in such a short period of time that it has been traumatized in a way, and the landscape that appears in the wake of rapid expansion and declining rates holds both peril and promise. The personal relationships that had held the studio community together when country music was smaller have given way to broader-based market forces, in a way very similar to the manner in which Nashville has shed its own small-town tendencies. It will never again be the biggest small town in the recording world. Nashville is now part of the global village, with all the honors and liabilities that accompany that status. ■

Dan Daley is Mix's *East Coast editor.*
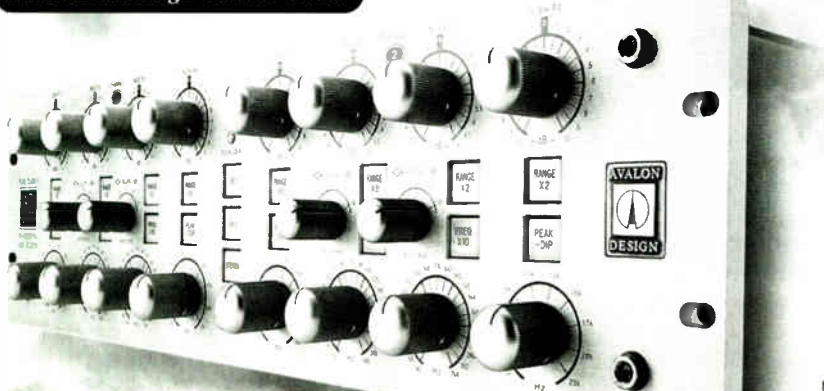
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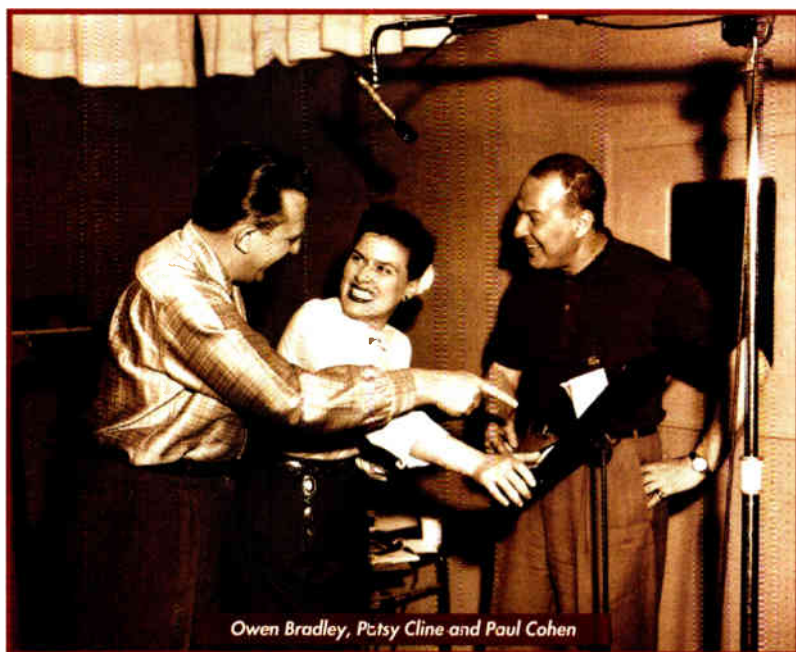
Owen Bradley, Patsy Cline and Paul Cohen

Nashville's
ORIGINAL
Engineers

TOGETHER AGAIN

It took a lot of phone calls and tracking down.
But on March 26, 1996, six guys piled into Emerald
Recording's upstairs offices who between them carried
approximately 200 years of cumulative—and in Nashville's case,
formative—experience. They are in their 60s and 70s now;
they're the people who laid the foundation for the
recording center that Nashville has become.

BY DAN DALEY

Chet Atkins (left) and
Bill Porter at RCA Studio B

Owen Bradley

for a little radio station in Murfrees-
boro. I made some contacts because I
met some people that worked for
WSM Radio. They knew the second
recording studio ever in Nashville—
Brown Radio Productions at Fourth
and Union (Castle was the first)—need-
ed someone down here to do some
engineering work, like mixing radio
programs and so forth. Brown's had a
total of four microphones and a 4-

These engineers worked with each other day
in, day out from the 1950s through the 1980s, in
many cases; and some of them had not all been
together in the same room for 40 years. There was
much bantering as they each entered. After they
got going, this interviewer had little to do but
check the tape periodically and look forward to
transcribing some truly vintage stories.

THE CAST AND CREDITS
Tom Sparkman: Statler Brothers, Barbara Man-
drell, Tammy Wynette, Jerry Lee Lewis, Patti Page
Mack Evans: Nashville's first modern mastering
engineer, founder of Masterfonics, engineered ses-
sions for Ringo Starr and T.G. Sheppard
Charlie Bragg: Lynn Anderson, Ray Price, Johnny
Cash
Glenn Snoddy: Roy Acuff, the New Beats, Johnny
Cash
Jimmy Lockert: Righteous Brothers, Marty Rob-
bins, Beach Boys, Conway Twitty
Ben Hall: studio designer and engineer for Roy
Orbison, among others

*You guys literally created the engineering com-
munity down here. What were your beginnings?*
Snoddy: I started in 1949. I got into radio elec-
tronics during the Second World War and was in
the Signal Corps. When I came out, I went to work

The Everly Brothers at RCA

input console, an old Western Electric 23C, I believe.

You'd be amazed how much stuff we did with four microphones. We did radio shows for regional networks, the openings of soap operas for radio stations. We did a show for Jack Spear out of New Orleans which was regional radio network. We did some kid shows for Mutual Broadcasting that went nationwide. We did 520 15-minute soap operas. I had to transcribe them onto disc and do the air checks. I think I listened to those things about five times each. Later on, I went to work for WSM—that's about when television came in, about 1955, I

would say. A lot of the engineers moved from radio after TV, and that kind of left a vacuum. I went to WSM then, worked the Opry for about ten years. At the same time, Castle Recording was owned by three of the WSM engineers—Aaron Shelton, George Reynolds and Carl Jenkins. We used to go down there and work part-time doing record takes. I would always be the second engineer. I never did any mixing; Aaron Shelton did all that.

Bragg: I started out at a 250-watt station around the midstate area. Glenn and Frank had moved to WSM. As Glenn mentioned, when WSM went on the air with TV, they dropped all

their audio engineers for the most part. So it opened up several openings for new personnel. Glenn and Frank had preceded me. One or the other contacted me and said to leave the little station you're working in in Shelbyville and come to Nashville, so I did. Glenn and Frank and Tom and Jimmy, quite a few of us. I think at one time, out of 12 engineers, nine of us at Columbia had been ex-WSM personnel. From WSM I progressed—what you may call a progression—to CBS.

Evans: I came much later than these guys. I started out in '59 in television. My dad was with the telephone company, and he knew Aaron Shelton, so he got me a job at WSM. Ten years of [working at WSM]. I learned my mixing skills and this, that and the other from these guys. My first boss was Mort Thomason, under Aaron Shelton. The first thing I did was count resistors because I didn't know anything else. I was still in high school, and then I went off to college for a while, came back and there wasn't anything at TV. So I got on with radio and started nine years up there, worked with Charlie and Tom and Jimmy Lockert. Glenn, you had already left I think when I came in, I guess it was in '60. Worked with these guys, did the waking crew, mixed the Opry and such. Charlie was at one time editing the Opry delayed radio network, and when he left, I inherited that job. Then I worked in studios for Nashville Record Productions mastering when I first left WSM. One week I was editing the Opry delayed radio network, and they were put on disc and pressed for distribution to radio stations. I went to work the next week mastering the Opry delayed radio network. I couldn't get away from it. Then I worked in several little studios, worked for Scotty Moore at Music City Recorders for about a year-and-a-half, and then in '72 I started Masterfonics and spent ten years there.

Sparkman: Very much like Charlie and Glenn, I worked at a 250-watt radio station in Columbia. A friend of mine left there and came up to WSM. After he had been here for a few months, he convinced me that I should follow him, and that progressed on in to moonlighting. I guess when Columbia bought Owen [Bradley] out, I was the first engineer hired after that.

One reason WSM supplied so many engineers to the recording industry is because we were one of the few radio stations doing live programming. We

Family Values

AT CASTLE, THEY DIDN'T HAVE EQ. YOU HAD TO SELECT MICROPHONES THAT SOUNDED LIKE YOU WANTED IT TO SOUND RATHER THAN TRYING TO ARTIFICIALLY TAILOR SOMETHING WITH AN EQUALIZER.——*GLENN SNODDY*

had a lot of live programming, and that gave us all experience working with groups, bands. That's where most of us learned to mix big bands, and of course the Grand Ol' Opry was a thing of its own. It had such a wealth of different types of programming that WSM did live, including symphonic-type work.

What about the early studios?

Lockert: Bradley's studio was on 16th Avenue in the basement. They built the Quonset Hut out the back. We built the damn building by hand to shoot pictures in. They did Army and Navy recruiting shows. We tried to fix it so it was like a barn out there. We had bales of hay out in that Quonset Hut there. That was the Quonset Hut in the back, and the control room was upstairs; you used to have to go up steps. Later on, they built the control room in the Quonset Hut. They acquired a console that was supposed to be shipped to Hollywood. Somebody sidetracked it into Owen's up here, and they installed it in the Quonset Hut downstairs. First session was [Columbia Records head] Don Law came in that day and said, "Do you want to work downstairs or upstairs?" He was one of those guys had his 2 o'clock watch on; never took a drink until 2 o'clock. I said, "Let's try the downstairs," so we went downstairs and we cut Stonewall Jackson. That was the first record cut in that Quonset Hut. I think about two weeks later we cut Marty Robbins' "Don't Worry About Me." [Guitarist] Grady Martin plugged directly into the board, and I said,

"Grady, don't hit that guitar like that," so I put a pad in. Just as I hit the control room door, Grady hit the guitar, fused the grids on the input on a preamp, burned out the primary transformer, and it was arcing inside. That was the start of the fuzztone. So the first fuzztone record was Marty Robbins' "Don't Worry." Later on, we got too busy to figure out what to do and make a little transistor model of that, and Gibson picked it up.

What was a typical session like in the '50s? What equipment did you have?

Lockert: When I came to Nashville, they were cutting records at Capitol direct to disc, and they had an Ampex 200 tape recorder that they used for backup. But the main recording was to disc. They did that for a while until they had some confidence in the Ampex tape, and then they started using tape to make the record.

Tape was around but no one really trusted it?

Lockert: It was a way of life back then that you just cut to the [disc], and that was it. When they started settling LPs and so forth, they started relying on the tape a lot more. That's where I came into it. I used to hear stories from my bosses about cutting things out in the field on field equipment for disc, but I never got into that.

Bragg: When I started at the hotel [Castle was in a downtown hotel], they still had the wax lathe or the turntable. The first session I worked down there, I believe, was Grandpa Jones' "Look-

ing Through the Knothole." We were cutting directly to the turntable. They may have had wire as a backup, I can't really recall. There was some sort of backup but I don't think it was tape.

On sessions like that, everybody was present all at once?

Sparkman: That went on really up till the '60s; in '65, '66 we progressed from 3-track to 4-track, and then immediately on into 8 and 16.

What was the setup back then?

Bragg: RCA 77s, 44s, old Altec Lansings, Western Electric 639s, Shure 50s and 55s. Maybe five or six mics.

How were they placed?

Bragg: Carefully, and where you needed them. [Laughter]

Snoddy: You didn't have that many musicians on there to begin with—you only had five or six musicians. The room was small at Castle, and we only used about half the space if I remember correctly. You had a mic on the guitar amp, the singer had one—they usually used a 639 for the singer, an RCA 77 for the guitar, a 44 for the bass, a standup double bass. I forgot what we used on the drums, but we used one or two mics for the drums, one overhead and one for the bass. We used a 77 on the piano. Just open the top and lay a mic in there. Owen played most of the dates on piano.

Lockert: There were two versions of that. Some of them we'd open the top and put the mic on a boom, and some of us would open up the top, wrap a towel around a 77 and lay it down inside the piano on the high end and shut the top.

Had Nashville sessions transitioned mainly from the artists' band to studio musicians by that time?

Sparkman: It was studio musicians.

So you knew when Grady Martin was coming in what mic you would be using?

Sparkman: Most of the time, you could set the EQ on 'em before the musicians ever hit a note 'cause you knew what they were going to sound like.

Snoddy: At Castle, they didn't have EQ, believe it or not, and that was one of the beauty parts about recording those days, because what you had to do was select microphones that sounded like you wanted it to sound rather than trying to artificially tailor something with an equalizer. I think they had one equalizer. That console came from a prior radio show that had to do with Eddie Arnold. Incidentally, it was a very good radio console.

Everything back in those days was vacuum tubes, but that was the best equipment you could buy. We've always been as good as anybody in the country or in the world as far as quality is concerned in radio or recording.

Lockert: That's how you got that clean sound, you didn't have all that crap in there to change it.

The sessions had kind of formalized by then at three a day. Were they pretty routine and would they go quickly?

Snoddy: Not necessarily. One time, we did a session in the old Brown's Studios. RCA used to come down and send their engineer and a tape recorder and a producer. [RCA Records president] Steve Scholes would come down, bring his engineer and his own tape machine, and we did a Johnnie and Jack session, the first record session I was ever involved in. They did a record called "The Atomic Bomb," this was right after World War II. They did 22 takes on that song. I thought they never would get that thing done. Most of the times, it was three to five takes.

Sparkman: One of my first sessions, I was backup engineer at the Quonset Hut on Patsy Cline when she cut "Crazy." That took four-and-a-half hours to get the record on "Crazy," but it was worth it. It was cut mono and 3-track at the same time.

Did that go on all the time? Cutting to different formats at the same time?

Sparkman: From the '50s through the '60s, we cut mono and 3-track at the same time. And they got the stereo off the 3-track, and we put the voice on the center track.

Bragg: You add color instruments basically to the left and your rhythm instruments to the right. At the Quonset Hut, we had three big [Altec] Voice of the Theater A7s, but you monitored monaurally, you didn't monitor stereophonically. The reason was because the records were put out in mono and you mixed to the mono tape, and the stereo kind of fell however you assigned it. But you were mixing the records, and that's what went out. You never remixed anything. The 3-track was only a backup. The stereo LPs eventually came off that 3-track. When you finished that mono mix, which you monitored and taped, it was physically cut out, leadered, and at the end of the session, 15 minutes later, it was shipped to the plate plant.

Sparkman: At the Quonset Hut, for

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how many years, Railway Express, their air version of Federal Express back then, picked up the tapes from the 6, 10 and 2 p.m. sessions every afternoon at 5:30 to go to New York, Chicago or wherever.

Lockert: You guys were lucky. We had to finish our sessions up at midnight and take them to Union Station and ship them out.

What was the transition like to new formats?

Bragg: Up until the time CBS bought out Owen, we were 3-track. Ampex 300. Then when Columbia bought it, they started to expand and bring in CBS consoles, and I believe the first one was a 4-track and then quickly went to eight.

Sparkman: By the time we got the 8-track installed and cookin', it was obsolete. We went to 8, 16, 24, bang, bang, bang.

Bragg: CBS built their own consoles out of New York, and they were very good consoles. You couldn't go out like you can today and buy a console. Nobody was making them.

Lockert: I built the first stereo console that was ever built in Nashville for Owen, but it was made out of Ampex mixer parts. Had four channels for the left, four channels for the center and four channels on the right. The only trick to doing that was in figuring out how to monitor it. We had to build up a monitor matrix so that you could select how you wanted to monitor. You'd monitor it 2-track or mono or 3-track, however you wanted to do it.

Bragg: Didn't you and Tom design the console at Ryman when we took it out and put it in down there? Of course, you were still monitoring monaurally, and you weren't concerned with taping. I think you guys built that console.

Sparkman: We built it, but I didn't have much to do in way of design of it. That had two or three submasters

Bragg: Which was a real innovation then.

Evans: Starday [Records] wanted to record one of those shows during the disc jockey convention, and Jack Linderman actually hauled the 3-track down there and we recorded in 3-track by multing off the submixes.

Snoddy: Let me tell you a story about the Ryman Auditorium and some of those things that went on down there in the '50s. It seemed like when a national pop artist would get cold, they'd want to come to Nashville and record so they could get a hit. We had a lot

of that going on down here. Some of them would record at the Ryman. We used it as a studio...

Evans: It's probably the best studio still in Nashville.

Snoddy:...Archie Gibbs was here, Ray Anthony; we did Ray Anthony's "Bunny Hop." That record was cut at the Ryman with Aaron Shelton doing the mixing. That song was cut with a total of about six or seven mics. We had, I think, six inputs on the console, and he brought down a little Collins mixer to add about three or four more inputs. But that record is still unbelievably good today. It stands out because of the techniques, the acoustics.

When did the independent studios start to come around?

Sparkman: Late '60s early '70s.

Snoddy: I think the first independent was Sam Phillips' studio. He built one uptown in an old lodge hall. A lot of good records came from that studio.

Bragg: There came a point in time it seemed that the individual artists like Cash, Stevens, the Glaser Brothers decided owning their own studio was the thing to do. That, I think, was at the point in time when a lot of the independent studios sprang up as these guys like Cash...realized that the studio business was a viable business, and you could lose as much money as you could invest. After a couple of years they decided, we'll let those big guys suffer the losses, let's bail out while we can.

Today, engineers have relationships with the producers. Back then, if someone wanted to use the studio, you came with the studio?

Bragg: To a degree. If you booked Columbia studios, you used their engineers. But you booked Columbia because you liked that studio and because you liked those engineers. That's why a producer would book those studios.

Who were some of your favorite producers?

Bragg: Billy Sherrill, Jerry Kennedy, Glenn Sutton.

Did they have their individual ways of working?

Bragg: Most of those guys were very conscientious. Of course, then there was Shelby Singleton. [Laughter] Shelby was, I guess if you looked up "character" in the dictionary, his picture would be there. He was a true character, but he was really pretty shrewd.

Lockert: Why so many of us worked with those particular producers was

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because we could communicate with and interact with those guys. Charlie could work with people I couldn't even stay in the same room with, and vice versa. All the guys, we were able to get along with certain personalities and some we couldn't.

Bragg: There was one particular producer that brought in a very top artist at that time, Bob Dylan [Apparently he's referring to Bob Johnston.] This was Dylan's first time into Nashville. Maybe Glenn started the session, and there was no better engineer at Columbia. There was a conflict of personalities, so Glenn lasted maybe 20 minutes.

Snoddy: That's the only session I ever got tired of.

Bragg: They went through the gamut of all of us on Dylan. I think I was the last one that was told to go up there and do the session. He wasn't happy with the drum sounds. I told him I would set the drums up out in the hallway, wherever you want it. I'm not going to argue. I'm just an extension of this console and an inanimate object. But he was an exception. Some guys, they would want slap back, reverb on the return of the echo. They would do all he could to sit there and intimidate you over nit-picky things. You kept your cool and figured, hey,

at the end of this session, I'll be off until tomorrow. You knew your studio and your equipment, basically the musicians that were out there, and they would leave it up to you unless they were wanting a particular sound maybe they were trying for or maybe something the artist had mentioned. I think 99 percent of 'em, and I think we'd all agree, they would come in and let you do your thing. For instance, Billy Sherrill did not give you a hard time unless you just screwed up royally. As long as you put the steel on the far left fader, so it gives them something to do during the session. [Laughter]

Did you ever feel like Nashville was becoming a factory? How did you challenge yourselves?

Evans: Sometimes we'd come in on Saturday, we'd put down the basic rhythm track, then we'd have a lead track, a vocal track and maybe background voices. So on Saturday we'd come in, and I'd take that band track, split it to two faders, and EQ differently and pan left and right to get a pseudo-sounding stereo out of the band track. The console I had at the time had no panpots; we just had left, center, center and right for the four tracks. During the mixing, we would have to switch the lead instruments from 1 to 4, 1 to 4, 1 to 4, so they appeared to be left and right. We got so good at that, that we could start an album, start the 2-track, and mix the whole album without stopping. That's what you call cranking out product by factory specs. That was low-budget, and we had the exact same band every time, and we mixed to the tracks rather than loading tracks or doing any of that, so we knew what was going to come back off that 4-track extremely well.

What about some of the sessions that stand out in your mind?

Snoddy: I have to tell you a story about my relationship with Johnny Cash. I got started mixing Cash's stuff because he was really kind of low on the sales chart at the time I came into the picture. They didn't really know whether they were going to keep him or not, because he was having a lot of personal problems and so forth. Don Law asked me to listen to a Sun record that Johnny thought was so great that he cut, and he wanted that same sound on that record. I listened to it, and the only thing I could hear was just a lot of slap-back on the tape machine coming back on his voice. They had cut that down in Memphis, and

that's what it was, what it sounded like to me. Cash wanted to know if I could get that same sound. I said, "Yeah, I could get that same sound." He said, "Well, that's what I want." So we set up this session in this small basement studio that Owen had, and we put the horns up in the reception office upstairs 'cause it was really too many people to get in this one small studio. [This was the original basement studio at Bradley's, prior to the Quonset Hut.] We did the session, "Ring of Fire" came out of it. If you hear that record, you'll hear all this slap-back on the voice.

Sparkman: You'd also hear the trumpet player say, "Can you hear?" [Laughter]

Snoddy: I have to tell you about one session at Castle Studio I was on that was kind of historic, and that was the last Hank Williams session that he ever cut. We cut four hits, and I was sitting here trying to think of all four of them. One was "Your Cheatin' Heart," another was "I'll Never Get Out of This World Alive." But we cut four big hit records on the night before he passed away the next Sunday morning.

Sparkman: We did a Jerry Lee Lewis session one night, and Jerry Lee liked to cut with everyone there—strings, horns, vocal group, the whole shootin' match. The song was "Me & Bobby McGee," and they got started on take 1, and it went for like 7 minutes, 6:35. Of course, it was just a rehearsal, but we ended up going back and using it. But one of the funny things that came out of it, Cam Mullins was doing the string arrangements. We went in the control room and listened to this thing. Jerry Lee was one of these artists that would get bored. After about the second or third take, you could forget his vocal performance because he was bored with it. He'd want to go on to bigger and better things. But Cam was sitting there at the console listening, leans back and says, "Man, that really sounds great. But I don't hear one damn thing I wrote." [Laughs]

Did Jerry Lee do his vocals at the piano?

Lockert: Yeah. Him and Sam Phillips got mad at me because Sam, at that time, had never cut a hit with Jerry Lee. I cut at this studio that he had up on Sixth Avenue. "What'd I Say" was recorded on used tape. Sam'd never set up new tape, always used used tape.

How'd you get separation between piano and vocal?

Lockert: Carefully.

Sparkman: I started working with Jerry Lee after he signed with Mercury Records. You always have a piano tuner come in the morning after a Jerry Lee session. That's not being critical, he just played the piano hard. Usually, we used one of the old Neumann U67s on his voice and whatever would be in the storeroom on his piano. He was a great artist.

Snoddy: I did a record one time with the New Beats called "Bread & Butter." One of the boys that sang with that group was a little bit difficult. [Hank Williams' publisher] Wesley Rose was the producer. This young man didn't like anything that any of us were doing. He said, "I'm gonna mix the next one." I said, "Well, here, have a seat." He got in there and he started mixing. And he told them to go ahead, and they ran through the song. When he got through, he said, "Play it back."

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REVOLUTIONIZING

The Electronic Media

by George Petersen

A REPORT FROM NAB96

One look at the evolving Las Vegas skyline and you can understand what's happened to the National Association of Broadcasters convention. Ten years ago, there were no pyramids or Stratospheres dotting the desert landscape, and people wondered whether The Excalibur could ever fill 4,000 rooms. Today, this is eclipsed by even larger hotels, and the growth trend has no end in sight. Construction is everywhere, from the New York, New York complex to the Fremont Street revitalization. Whether you're talking about casino developments or technological developments, bigger, better, faster is the rule.

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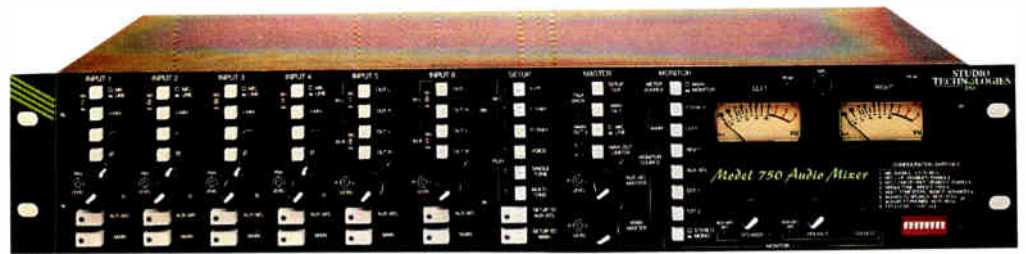
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From April 13-18, 1996, a record 92,333 broadcast and production professionals descended on Las Vegas for the National Association of Broadcasters convention. With nearly 1,000 exhibitors this year, the show has outgrown the cavernous Las Vegas Convention Center and expanded into the nearby Sands Convention Center. Ten years ago, I could see all the new audio goodies at NAB in two days. Now, even four days doesn't seem like enough, even with exhibits opening at the distinctly *non*-Vegas hour of 8:30 a.m. (ouch!).

The show's theme, "Revolutionizing the Electronic Media," was evident to anyone walking the show floor. Computer-based desktop production systems were everywhere, and many of the systems that offered cuts-only editing a few years ago were now displaying editors with comprehensive onboard visual effects packages. Companies such as Apple, IBM, Microsoft, Macromedia, Adobe and Quark have become major players in broadcast. Old-timers beware: It's a brave new world, and you better get used to it.

DVD was a constant topic of conversation at the show, and there was genuine optimism about the possibilities offered by what is now increasingly referred to as the Digital *Versatile* Disc. Sonic Solutions ran continual demos of DVD Creator," the first complete premastering system for DVD releases, and announced alliances with Warner Bros., Warner Advanced Media Operations and Thomson Electronics. Leading post facilities that will use DVD Creator are working with Sonic to expand the capabilities of the system. In other DVD news, Warner Bros. International Dubbing Operations in Burbank has been using the new "Media Tracks" feature of the Studer Editech Dyaxis workstation to assemble hundreds of subtitle tracks for DVD releases, which can carry up to 32 different subtitle tracks and multiple surround channels.

New alliances have become somewhat of a tradition over the past few years, and some interesting pairings were announced at NAB. Avid and Lucasfilm, working to provide an integrated systems approach incorporating elements of Avid's Film Composer, Audio-Vision, Matador, Media Share, MediaServer and Digidesign's Pro Tools, announced the AvidDroid hardware controller. Dolby and Digidesign announced plans to integrate the new Dolby Drive removable media dubber into the Pro Tools and AudioVision environments; a Dolby Surround encoder-decoder plug-in

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is also in the works. And the Trinity, the powerful, low-cost video workstation from Play Inc., which debuted last year, now offers a palette of Softimage visual production tools. Meanwhile, Graham-Patten has developed the audio editing side of Trinity, with some serious hardware and software interfaces, including 16- and 20-bit digital I/O boards, ADAT optical I/Os, disk recording with 16-record/32-playback tracks, and a DSP farm module.

Speaking of new formats, Panasonic showed its DVCPRO, a component digital videotape production format (with CD-quality audio) on a pocket-sized cassette and announced a computer drive bay-sized player, designed for loading field tapes directly into PC-based edit systems.

From the audio standpoint, there was plenty of action at NAB, so get out your shopping list: Digital dubbers were hot, with products due later this year from Akai, TimeLine, Dolby and Sony; Fairlight was showing a working unit. Digital consoles have gone from dream to reality, as I counted more than a dozen digital mixers on display from Amek, AMS Neve, Audio/Design, Fairlight, Graham-Patten, Korg, SSL, Sony and Yamaha.

To go with your digital console, what you *really* need is a 24-bit, 48-track recorder. Sony unveiled the PCM-3348HR (high resolution), a DASH-format reel-to-reel machine with 45-minute recording capacity on a reel of ½-inch tape. A wide selection of interfaces (including MADI) will be offered, along with serial and parallel control port options. Compatibility with existing 24- and 48-track DASH tapes is assured, according to Sony.

There are times (and budgets) when 48 tracks is a bit much. To address that market, Fostex unveiled the D-80, an 8-track hard disk recorder/editor in a three-rackspace box. Affordably priced at $2,195 (including 850MB removable hard drive), the D-80 provides 18 minutes of uncompressed 16-bit record time at 44.1 kHz and the ability to slave three units for 24-track capacity. The front panel snaps off to double as a remote controller, and a 1.3GB plug-in drive is optional.

Anyone with an ENG truck should rush out and buy the Model 750 audio mixer from Studio Technologies (Skokie, Ill.). This is no repackaged P.A. or disco mixer: It's packed with the real features that broadcast pros need. Housed in a two-rackspace chassis, the 750 has four mic/line inputs (with

switchable phase reverse, highpass filters and phantom power), two stereo line inputs, speaker and headphone output controls, mechanical VU meters, aux/AFL stereo bus, digital tone generator (selectable from 50 to 15k Hz), high-quality onboard limiter, mono (phase-compatibility check) switching and an extensive monitoring section for selecting any input or output source. A talkback mic allows routing voice commands directly to output buses or to a 12-second digital recorder for instantaneous playback of channel IDs, site locations, etc.

Disk-based video recorders are becoming more affordable. Two new models that are targeted directly at the audio post market are the VVCR from Drastic Technologies (Downsview, Ontario) and the V1 from Doremi Labs (Los Angeles). Both systems provide tape recorder-style front panel controls, easy operation, a variety of compression ratios, removable media, compact rack-mount packaging and serial/parallel control support. The V1 retails at $5,995, but for the same money, the VVCR adds NTSC/PAL composite, S-VHS, component or D1 video I/Os, along with a

Fostex D-80 hard disk recorder

large LED timecode display and MIDI machine control for simple integration into an ADAT/DA-88 sequencer-based scoring environment.

Also on my NAB shopping list is a Marantz CDR620 stand-alone CD recorder. I already have a CD-R burner hooked up to my mastering system, but there are times when all you really want to do is cut a quick CD of a session, without having to deal with a workstation, and the CDR620 is just the ticket. Besides, it has a SCSI port, so if you want to do all those slick workstation tricks, it can handle those chores, too. Best of all, it retails at a down-to-earth $3,600.

But what wowed me the most at NAB wasn't an audio product per se,

but the CamLink 100 video transmitter system from Telex. A tiny transmitter (a variety of directional and omnidirectional antennae are available) mounts between the ENG/EFP camera and the battery, and transmits the video, audio and timecode to a receiver up to 100 meters away. Very nice, but a companion CamLink R100 receiver mates with a Sony handheld 8mm VTR/monitor, allowing the producer or director to not only see what the operator is shooting, but also leave immediately after the shoot with an 8mm reference copy (with window-dub timecode!). The transmitter also sends camera tally signals to put the VTR into record when the camera rolls. What? No more standing around while some whiny producer waits for dubs? (*Their* time is important, you know.) This is what technology is all about.

Mark your calendars now for NAB97, April 5-10, 1997 (exhibits are open April 7-10). In the meantime, the NAB Radio Show, October 9-12, 1996, and the World Media Expo Television/Video/Film Exposition and Radio/Audio Exposition, come to the Los Angeles Convention Center October 10-12, 1996. See you there. ∎

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BRIAN AHERN

A RARE INTERVIEW WITH COUNTRY'S GREAT 'NATURAL' PRODUCER

Music is much more than the articulation of mathematically executed notes. It is the rendering of the space in between those notes that helps give each performance its unique character and soulfulness. This may seem like a very logical assumption, but most productions fail to illuminate and enhance that reality.

Brian Ahern understands the value and beauty of using space to create unique soundstages that have subtle immediacy, depth and color, a technique that can be readily heard on classic recordings by Emmylou Harris, Anne Murray, Ricky Skaggs, Ronnie Hawkins, Jesse Winchester, George Jones, Rodney Crowell, Roy Orbison, Jonathan Edwards, Johnny Cash, Billy Joe Shaver, Albert Lee, George Fox, The Woodys, Terry Radigan and others.

Ahern got his start in music in his hometown of Halifax, Nova Scotia, playing guitar in three bands and regularly performing on two Canadian television network shows. While in Halifax, Ahern met a young female singer named Anne Murray, who was performing on a TV show where he served as music director. That meeting launched Murray's incredibly successful career, and provided Ahern with the

Brian Ahern (L) with Mark Knopfler on the steps of the Enactron Truck outside Bradley's Barn

impetus he needed to begin a full-blown production career.

Ahern moved to Toronto, where he produced ten Anne Murray albums and gained national prominence in the Canadian music industry. After a string of hits with Murray, Ahern's next find was Emmylou Harris. After moving to Los Angeles, Ahern produced eleven classic albums for Harris, including *Pieces of the Sky, Elite Hotel, Blue Kentucky Girl, Roses in the Snow* and *Evangeline*. They were also married for many years and had a child together.

"I was very lucky to do all of those records with Brian, because I learned to be completely relaxed and open to the creative process," recalls Harris. "I really feel that I became a recording artist during that time. Brian tends to have a lot of faith in the intrinsic instincts of an artist. It is because of this empathy [that] he attempts to make the artist blossom intact, rather than trying to fit the artist into his particular sound."

Ahern's production sensibilities have influenced the cream of Nashville's best producers. In fact,

it would be fair to say that it is almost impossible to hear country music of the last 15 years without recognizing elements of Ahern's sonic vision.

"Brian Ahern's Emmylou Harris albums rank up at the top with the great country records that were done by Billy Sherrill and Owen Bradley," says Tony Brown, president of MCA Nashville. "Although that seems like a big statement, Brian's influence on how records are made in Nashville today is more prevalent than some would care to admit. When I was looking for a producer to do the *Bradley Barn Sessions* with George Jones, there was only one person I considered, and that was Brian Ahern. The end result was a classic 'Jones' album that will hold up years from now."

Over the years, the quiet and elusive Ahern has turned down many requests for interviews. So fans of Ahern's work will no doubt enjoy the anecdotes recounted here, and those looking to refine their production and mixing sensibilities should appreciate the generous tips offered. *Mix* is especially grateful for the time and care he took in helping us make this a special interview.

BY RICK CLARK

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How did you get into production? Were you a musician first?

I remember the first job I had. I used to watch a live local television show that broadcast from a TV station a couple miles from my parents' house. One night I noticed the guitar player was missing, so the next day after school I went over there with my guitar and told them I wanted to do an audition for the job and I got it. They made me play a live guitar solo in front of some fishnet every Saturday night. I was 17 or 18, I guess.

So I started making money playing folk and electric guitar. At one point, I had actually three bands going simultaneously. I was working at two different television networks, CBC and CTV, at the same time with these different bands and they didn't catch on.

One of the bands was called The Offbeats, and we played on a national television show called *Music Hop*. They were going to play records and have kids dance, and we convinced them that we could play the hits just as well as records and it would be much more interesting to have live music. I wore sunglasses in that band, because the lights annoyed me, but the image of the sunglasses became a very hip thing and generated lots of fan mail. Paul Shaffer wears sunglasses to this day. Maybe it is a Canadian thing. [Laughs]

At the same time, I had a band on the other network called The Nova Scotians that played totally different music like Celtic jigs and reels. I was not recognized without the sunglasses, and I had changed my hair. We wore plaid blazers and really itchy gray flannel pants.

I had a third band of totally different musicians, called the Bad Seeds. We had a record deal in the States on Verve Forecast and we put out a couple of singles.

I was also music director on the folk music show called *Singalong Jubilee*. That was where I met Anne Murray. This was all in Halifax, Nova Scotia. Even though I had all the work I could handle in Halifax, I got bored. I went to Toronto and starved for a while and talked Anne Murray into doing a really cheap album for $2,500. That was around 1968. I used that record to get her a deal at Capitol Records, where she stayed for 20 years.

That first Capitol album had the international hit "Snowbird." Was this album your first major-label production?

Yes. I produced that and I played everything except the strings [on that track]. It was my first 8-track experience, and I could only think of six tracks worth of stuff, including the strings.

While you were in Toronto, you conceived and built what has become one of the legendary mobile studios in the music industry, The Enactron Truck. How did that come about?

It was inspired by an image that had

come to me in my sleep. One day, about 1971, I got up on the garage roof at my Toronto home with all the cardboard and plywood I could gather from the neighborhood and built the interior of a mobile unit. I walked around inside this space I was creating and cut it, hacked it and changed it until I got it the way I liked it. I then called up a young architect to come over and draw it before the wind blew it down. I wanted to make it a real studio, with an overdub booth, a control room and a shop in the back, with a machine room. So I had this crazy idea and did it.

Why a mobile unit?

I had left a successful career in Halifax to starve in Toronto. Once I had a successful career in Toronto, I assumed that I would be moving on. This time I wanted to have some tools that I could count on that were constant. At the time, a typical mobile unit was a cluster of equipment strapped down and wired together in a box on wheels. I wanted to have a working environment, fixed and comfortable inside, but very portable. It had to have at least three rooms with sound-lock doors. In most trucks, the speakers are jammed into one end of the vehicle, and the other 30 feet are behind you. I mounted my gear sideways, so you could look in either direction and have a 40-foot sight line

at all times. I lined it with lead, so that if we pulled up next to a radio station, power pole or a lighting tower, RF would be minimized; although we tell clients we did it so we could mess with Lois Lane, and Superman would never know.

So you bought the trailer. Did you buy a truck with it too?

No. This thing is making money when it's parked. When you buy a tractor, you buy it with the idea that you're making money while you're rolling. So I just rent a tractor and he comes with a million dollars of insurance.

What are some of the more memorable sessions in the truck?

I had an interesting experience in Toronto just before I left for Los Angeles. I was sweetening an Anne Murray album and working on two other Canadian projects at the same time. The trailer was in a machine shop having some welding done. I had a big horn overdub session to do, so I booked these guys into the machine shop—all those brass horns in a shop full of steel machinery. We hung the music charts from the lathes, and we sat on crates. It sounded like some bizarre steel temple.

I had a realization that the Enactron Truck could stimulate the people and enhance the music. I decided to try this idea on a big string session. At that time in Toronto, most of the string players considered it a real yawn to come in to studios and overdub on popular music. It showed in their attitude and performance, until I booked this session at their Toronto Symphony home, which was an old wooden concert venue downtown called Massey Hall. They had to play well, because it was their place. Their attitude was totally different. They played their hearts out. I had big speakers on the stage, so they could listen back and fix things. We finished early, and it was wonderful. That's when I realized what magic I could work by having a mobile studio.

Typically, we drag music into environments that continue to become more sterile and generic. Everywhere you go you encounter the same configurations and equipment.

How has the Enactron truck evolved over the years?

I've just kept turning the gear over and keeping the stuff that wasn't necessarily the most valuable, but had the most character and would be difficult to replace. I like gear with attitude. Flat is boring to me. My favorite EQ is a big old stainless steel Lang. I recorded all that acoustic Emmylou Harris stuff with

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bums that we did had some little rule that would serve to set it apart from the other records. In this case it was a big rule: no drums or electric bass. There might have been an occasional cardboard box or foot pedal, but most of the rhythm came from that big Gibson, and no click track.

Tell me about some of the most significant moments in your production career.

The high point for me, as a record producer, happened while I was working in a studio I built in North Hollywood. Roy Orbison called to tell me he had won his first Grammy. After all he'd accomplished, he finally got a Grammy. He was emotional and weeping. It was for a song we recorded called "That Loving You Feeling Again."

Do you remember anything about those sessions with Roy?

One thing you'll notice about Roy's records, especially the old ones, is that there are few solos of any kind, or as he calls them, "rides." Sometimes he might have a riff, as in "Pretty Woman." During this session, Skunk Baxter was designing an electric guitar solo. Roy took me aside and said softly, "B.A., I don't like 'rides.' I'd rather we just called a break, and you and I sit in the control room and we'll write a third part or some kind of a bridge just to make the song longer, so we don't have to have that 'ride.'" So he bounced stuff off me and I told him what I liked. We worked it into the arrangement and bang—there was another "Roy Crescendo"! So you'll notice there's no solo in that record. That's why many of the Roy records have that huge crescendo—out of desperation, because he couldn't tolerate solos. You know, he sings very softly.

Even in those real impassioned parts?

They sound loud, but it's just what he's doing emotionally with his throat. Good singers are true athletes.

The lowest point in my career was when I had to file for divorce [from Emmylou]. It was more than the break-up of a marriage. My identity was caught up in being the producer of this quality body of musical work, which was about to come to an end. The last record we did was *White Shoes*.

What is your opinion of the sound of the CD reissues of Emmy's catalog?

Since I've heard the first few CDs, I've kind of given up on hearing my old analog work remastered. And I wish they'd called me. When I made those records, I often had three reverb effects

going in the mix, and they were all clearly identifiable and all were making their analog contributions. When they got to the reissued CDs, they were all blurred into one reverb.

I built a two-story booth off the control room with non-parallel walls and a teak tongue and groove floor. We called it The Silo Room. That room typically was populated with lush Roger LS3-5A—my favorite—and edgy NS-10 speakers on the floor. I panned a stereo send to get suitable balance between the two. I would often send a kick

> **Many people are pontificating about how they masterminded country rock. We all just did the best we could with our influences and the assets around at the time.**

drum through the LS3-5A and a hi-hat through the NS-10. In addition, an AKG BX-10 would furnish the brief, initial reverb, and I used the Lexicon 224 to leapfrog over it. So the effects were in constant motion waving outward. I always attempted a sense of place. I use tape speed to alter the delay time of rooms. Having recorded a drum or vocal, I might speed it up or slow it down and play it back into the room. If you speed it up for instance, and run it through the room and record that sound, when you play the tape back at normal speed, you get a larger version of the same room. You can go for the opposite effect, too. I'll spread the larger version of the same room out wide. When I do that, the sound will seem to zoom out through the small room into the big room. These are time-shifted versions of the same room that I've recorded in stereo. It's true stereo, so it works up in mono.

What are some other things you have done to play with space?

There's a track on Terry Radigan's record, "Never Gonna Fall in Love

Again," where I had my Neumann M50 mics about 60 feet from Eddie Bayers' drums. During mixing, I shifted the ADATs to remove the decay time, as if they were right in your face. Then you have the sound of something 60 feet away, but not the delay that your brain normally expects to hear. Spooky.

Have you bothered to transfer your old Emmy masters to DAT?

I have analog generational safety copies that I've transferred to DAT, a frail format which I mistrust. I'm going to put them on ADAT, which is very robust. ADAT is like driving alone down a six lane highway. You may only need one lane, but you can mess up and not worry about it. You can stomp on the tape and wrinkle it and it still plays. What's even better is magneto-optical. It's supposed to last 100 years. Perhaps we should carve the numbers into the pyramids.

Emmylou is finally getting the box set treatment this year. What input did you have on this box set?

I've got my work in three box sets so far, and in all three cases I've declined to interview or contribute to liner notes because I think my work speaks for itself. I'm not about to ramble on and on about it. I've also been called by three or four different people who are writing books about country rock and how it evolved. There are many people who are pontificating about how they masterminded country rock. We all just did the best we could with our influences and the assets around at the time. We never did any masterminding, so I just decided not to say anything. It's so unconscious. You just do what you can. When the Beatle albums were being made, I'm sure they didn't sit around and say, "They're going to love this in 1996. We're going to reissue it…" [Laughs]

What is it about country music that appeals to you?

I'm not a swept away, spellbound country music fan. I like a lot of things about country music, and I respect what has happened historically. However, there is something about every kind of music that appeals to me. The George Jones record I produced was sort of a dessert tray of country music. Only in country music can you have a song about a family who are so dirt poor that they can't grow anything until they bury their mother under it. That's what I like about country music. Try to put something like that in rap or pop! Country music is the only venue for

some of those real feelings, and people know it.

How did the George Jones Bradley Barn project come about?

I got hired to do a Dan Seals project and was fired halfway through. I got angry, so I finished a couple of songs with my own time and money to play for skeptics. I think that determination to finish appealed to Tony Brown [president of MCA]. When it came time to do the George Jones project, which we both knew would be like running Desert Storm, Tony picked me. I also had one foot in the past and still had one foot in the present. I came up with that retro concept for George, wherein I put him in a sonic time machine hoping to provoke him to sing as in days gone past. It worked. I wouldn't allow any electric bass or crashing drums. I wanted to transport George back in time. It was just an intuition, but I always thought that singing against an acoustic bass seemed to be a part of his thing. The bass would strike and then fall away, and his voice would fill and swell. It worked, as you can hear. George went back in time.

So everything was cut just straight on the floor...no overdubs?

I had assembled a team of superstar musicians and did not want to bore them. First of all, I would rehearse only sections of each song with the band. When it came time to play it all the way through, I would hit record, and, because they knew the song, but they'd never really done it all the way through, it was fun for them and the sky would open up. There was an excitement and an urgency, a kind of presence to it. I recorded that "excitement" first. Then we would do two or three more takes that were increasingly more tidy. I almost always used the first take, and then I would plunder the subsequent takes when needed to replace an occasional sloppy passage in the magical first take. I used the technology to actually avoid overdubbing. I think this was the first big Nashville ADAT project. Alesis was very helpful.

And the groove was steady enough that you could lift from the other takes...

Yes, plus with ADATs you can shift things around. Like two trains in the night, you can line up the windows and look right through them. You can look through eight trains. Once in a while the bluegrassers, like Marty Stuart and

Ricky Skaggs, would rush a little. That's part of bluegrass, and that's why we love that music. The rock guys, like Leon Russell, would sometimes lay back. The windows on the trains wouldn't line up, so I'd slow the "grassers" down about 12 milliseconds for a few bars, when they got a little excited, and at that same point, maybe I'd speed up Leon Russell about 8 or 15 milliseconds. The outcome is impressive. That's how you avoid doing overdubs. You mine and shift.

Not only have you done the lion's share of your recording in the Enactron Truck, but I understand that you do your mixing there.

Two songs on the new Ricky Skaggs album were mixed by me in The Truck, and it's an "illegal" mixing environment. You're not supposed to be able to get good sounds there, but we have done it for 25 years. It's a poor mixing environment, according to the rule makers. It's only eight feet deep, and when you mix you have your back to a wall. Some of the bass passes through the walls, which I think is good, but that too is illegal. We pioneered the use of near-fields because we were compelled to record, overdub and mix masters in

the truck. All those early Emmylou albums were done on Klipsch speakers and a single Auratone.

Are there specific things you like to do for mixing?

I like to continuously do updated rough mixes back to the ADAT while working on a project. When it is final mix time, I instruct the engineer to have my rough mix in sync and available at any given moment on a 2-track selector button on the console.

What projects were done in that truck without you?

Hundreds. We did *The Rose* with Bette Midler and Barbra Streisand's *A Star Is Born.* We've done symphony orchestras, Black Sabbath, Bob Dylan's *Hard Rain* and a lot of television. I've been told we have over 40 Gold and Platinum records attributable to work done in the Enactron truck.

One of your most recent productions is Terry Radigan, which is still unreleased.

Yes, it's an album I did for Asylum Records here in Nashville. I developed her and managed her for a while. Got her a publishing deal with Tree and put together a showcase and that kind of thing. When we signed with Asylum, they were going to be the special alternative country record label. By the time we finished the record to their liking, they had experienced what record company president Kyle Lehning called "mission creep," which is a military term. When it was time to release the record, they had evolved into mainstream radio pursuers. They were no longer the company she had signed with, and there was a mutual separation.

From your perspective, how is the future shaping up?

I have a Ricky Skaggs single climbing the charts right now, with two more singles in the wings over at Atlantic. I have been approached with four record projects, one of which is pop, and another which is a film soundtrack. One of the projects is a wonderful duo called The Woodys. They sound like Gram Parsons and Phil Everly. I am also looking forward to the imminent release of Terry Radigan's debut. After maxing out what Halifax, Toronto and Los Angeles had to offer me, I find myself really busy in my fourth city, Nashville. ∎

Formerly based in Memphis, writer, songwriter and producer Rick Clark now lives in Nashville.

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SOUNDCHECK

HOUSE SOUND FOR THE ACADEMY AWARDS
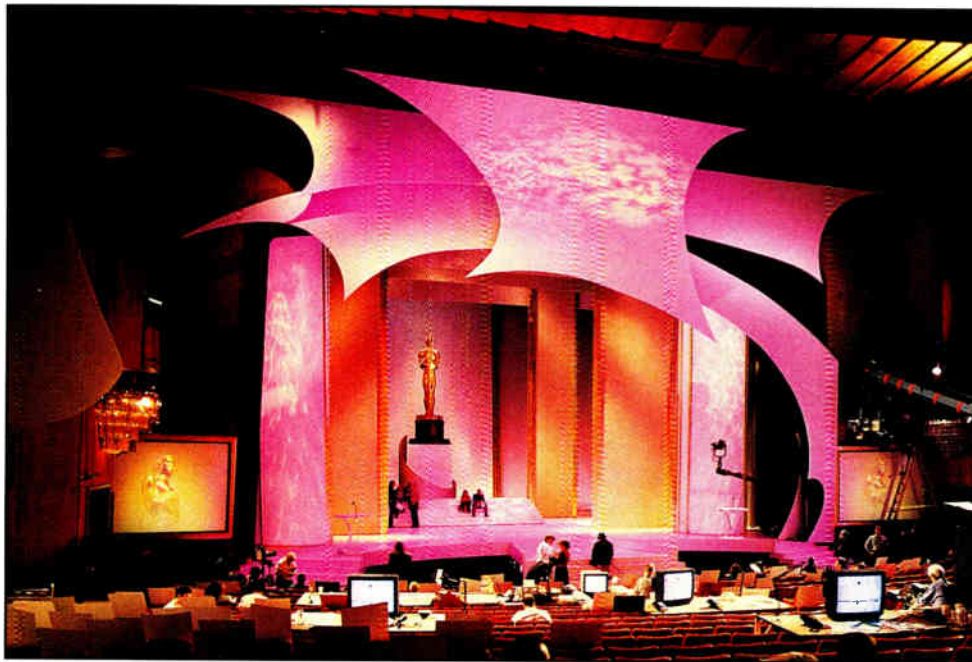
Left: Stage setup at the rehearsal. Below: In the Remote Recording Services Silver Studio are (seated L-R) owner/engineer David Hewitt and World Studio Group CEO Chris Stone; standing are assistant engineers Phil Gitomer and Sean McClintock

In the land of high-profile awards shows, nothing quite compares to the Oscars. There are bigger-venue shows, more demanding shows and perhaps even more complex system setups. But when the baton drops at about eight minutes till air, nothing matches the intensity or grandeur of Hollywood's annual honors. Hell, even the crew shows up in black tails.

Literally scores of stories could be written in and around the technical requirements and applications of the Academy Awards broadcast. Just from an audio perspective, *Mix* was pitched on stories ranging from Whirlwind connectors to EAW's house loudspeaker system, and everything in between. Much has changed in the past couple of years in terms of who handles audio services for the Oscars; little has changed in terms of the process. But perhaps the biggest measure of consistency has been independent engineer Patrick Baltzell, who has mixed the house for the past eight years.

"Dialog is king," says Baltzell, who has made a career out of FOH mixing for live shows ranging from

the Democratic and Republican national conventions to the Grammys (eight years), to the Emmy Awards, the Billboard Awards, the Academy of Country Music Awards (15 live performances, seven consoles) and, coming up, opening and closing ceremonies for the Summer Olympics—name the show, he's mixed it. The Dorothy Chandler

Pavilion is the winter home of the L.A. Philharmonic; Baltzell mixes from the Founder's Circle, or the first balcony. "My job is to ride the dialog portion of the show right up to the edge. It's never quite loud enough [in the house], especially on the lavaliers when you get soft-spoken people. Everybody always wants it a few dB louder, yet it used to be that you were always

Bob Seger &
The Silver Bullet Band

For the past decade, fans have been waiting for Bob Seger & the Silver Bullet Band to tour. Six shows at the Auburn Hills Palace in Detroit sold out in under an hour, breaking all records for the building. Later this summer, Seger will return to his hometown to appear at three Pine Knob shows for an expected audience of 180,000.

House engineer Robert "Cubby" Colby is taking a sabbatical from his duties with Phil Collins, a client for the past eight years, in order to mix for Seger. Other Colby credits include Prince, Janet Jackson, Paula Abdul and The Cure, to mention just a few, and he is a perennial TEC Award nominee.

Colby mixes Seger on his very own Amek 56-channel Langley Recall console, using 43 inputs from the stage and 13 effects returns. "I had no intention to buy this console originally," says Colby. "I'm not in the console rental business." If there's any doubt that this console has finally arrived, one has only to look at the number of acts touring with them this summer. The same day I saw the Seger show at Portland's Rose Garden Arena, another Recall was across town with the k. d. lang show at Schnitzer Hall.

PHOTOS: STEVE JENNINGS

L to R: Randy Wille, system engineer; Rab "Cubby" Calby, FOH engineer; Kevin McCarthy, stage tech; Randy Williams, monitor engineer

The Recall console works with a laptop PC that stores settings, automates levels and mutes, and can trigger MIDI events. The position of all knobs and switches can be stored for ten different bands, allowing opening acts to share the headliner's desk with a minimum of disruption. The console can be reset with a choice of coarse, medium or fine accuracy, and the operator can choose which sets of controls will be recalled or ignored. A window on the PC screen shows settings for the preamp, routing, EQ

and auxiliaries, one channel at a time. Rotary controls have a red arc showing the angle through which the control must be turned to bring it to the stored position; when readjusted correctly, the control goes gray. As each channel is reset, the next one automatically comes up on the screen. The Recall system also features Rupert Neve's voice through the headphones, telling you which controls to change. "We never have to worry about what we've got to do for the support act," Colby explains. "They can use my effects, do whatever they want, set up the desk any way they want, and then the next day the same support engineer is really happy because everything's all set for him." After Seger's opening act, I watched Colby reset the entire desk and then double-check it in less than ten minutes.

The console's Showtime automation allows snapshot control of fader levels, mutes, MIDI events, mute and VCA setups, and Virtual Dynamics

BY MARK FRINK

BUSH AT ARCO ARENA

British grunge rockers Bush recently toured the U.S. in support of their latest album, *Sixteen Stone*, and were joined by opening bands Goo Goo Dolls and No Doubt. Sound for the tour was provided by Clair Bros.; *Mix* caught a show in early March, at the Arco Arena in Sacramento, Calif.

FOH mixing was handled by Dave Natale, who has been mixing for Clair Bros. since 1978. Natale started working with Bush in early 1995, when the traveling production consisted of the band, Natale, monitor mixer Raza Sufi and a couple of crew guys all in one bus, with a monitor system and the band's gear in a trailer. "That was about 369 days ago," says Natale on a March afternoon. "And they went from clubs like the 9:30 Club in Washington, D.C., which is about 300 seats, to [13,000-seat arenas] in a year.

"When we came in and started playing these clubs," continues Natale, "I'd explain to them [things like] if you turn the amp down, then it will sound better up front, and they tried different things, like turning the amp down, turning it around, taking it off the stage, miking it and putting it through the monitors; they tried everything, and none of it was quite right. If they did that, it's not Bush anymore. We were trying to make it different so it would be better in clubs, but we just didn't have enough horsepower in these club P.A.s to make it happen."

When the tour began, the band

PHOTO: STEVE JENNINGS

didn't carry a P.A.—they would use whatever house system was available. "Raz had a monitor system because you can't rely on house monitor systems," says Natale. "So I had like 25-watt house P.A.s, and he had about a 100,000-watt monitor rig, so it's

BY SARAH JONES

K.D. LANG

Grammy Award-winning Canadian singer, songwriter, entertainer, and dancer (!) k.d. lang is on a whirlwind international tour in support of her latest album, *all you can eat*. After two North American legs and side-trips to Great Britain and Australia, she is due to hit summer venues back in North America. We caught up with the tour at the Paramount Theatre in Oakland, Calif., and the Schnitzer Hall in Portland, Ore.

Grant McAree, who has mixed for lang for nearly a decade, used a 56-channel Amek Recall console with Virtual Dynamics configured as 48 mono channels and eight stereo effects returns. The Recall's Showtime automation is a

PHOTO: STEVE JENNINGS

DOS program that runs on any 486 IBM-compatible computer (the Thinkpad is recommended for touring applications). The ability to archive the FOH console's settings and performance sequences as a computer file makes it simple to request the same desk overseas—simply bring the laptop and plug it in. Shows can be programmed offline ahead of time in the comfort of an aircraft cabin.

The Showtime automation display shows inputs across the bottom half of the main screen. Each channel shows its VCA assign at the bottom, and at the top its channel number, mute status and performance mode. The Recall desk runs each channel

BY MARK FRINK
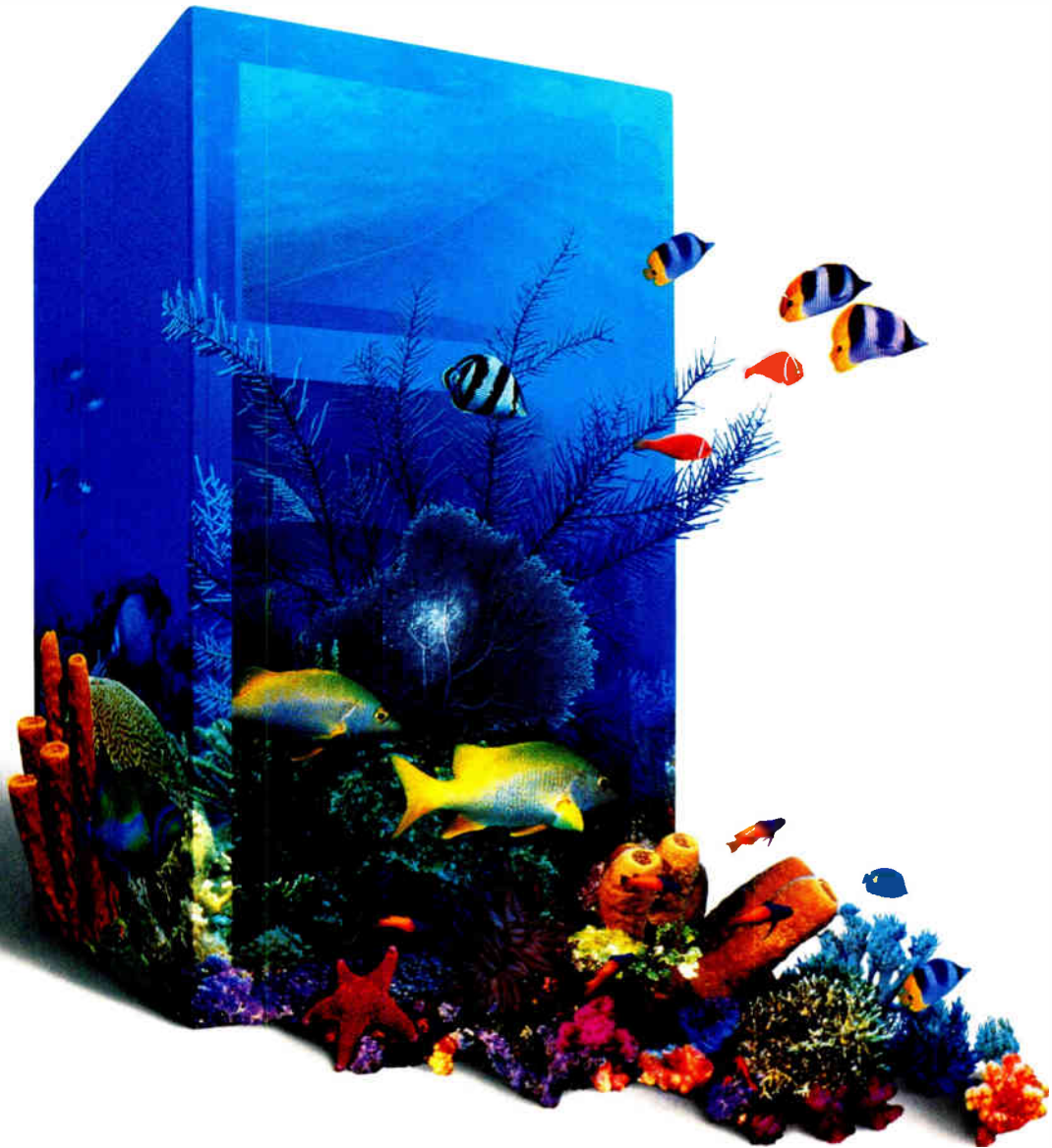
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—FROM PAGE 124, BUSH AT ARCO ARENA

much better now, because at least I have enough horsepower to keep up with them."

Natale mixes on a Yamaha PM4000 and maintains that although the scope of the tour has grown dramatically over the past year with Bush's increasing popularity, production remains simple. "This mix is like 16 channels, 18 channels," he says. "It's just the way the band is. They still have [guitar] cords. There's hardly any effects, the mix is loud and there's not a lot of air in it."

Processors at the FOH rig include Aphex 612 noise gates and Yamaha SPX1000s, although the reverbs are used only if the room sounds dry. No compression is used in the mix, says Natale. "It's boring if you [use compression], because then you don't have to do anything. You just sit there and the limiters do everything. So I push the faders up and down a lot; I figure I'm a mixer, so I'd better mix. You could put a gate and a limiter on every channel and just sit here and it will run itself, but no skill is involved in that."

Monitor mixer Raza Sufi is an independent engineer who joined Clair Bros. for the Bush tour. "Basically, a full mix of everything goes throughout the sidefills," explains Sufi, who mixes on a Midas XL-3. "Their monitors just reinforce what they want to hear at their 'spots,' like this side is guitar-heavy, that side is bass heavy. But it is a full mix of everything. The only guy that moves around anywhere is Gavin [Rossdale], the lead singer.

"There's four guys onstage, and we're running 12 mixes, which seems like an awful lot, but there's four sets of three-way sidefills," continues Sufi. "The singer gets his own sidefills, which are on a single motor, which allows us to angle them just at him. And then there's the main sidefills, which consist of four R4s and four sub ML18s a side." Everything onstage is basic Clair Bros. equipment: There are double-15s for bassist Dave Parsons, guitarist Nigel Pulsford and drummer Robin Goodridge; Goodridge also has subs in his monitor setup, and singer Rossdale has a pair of Clair Bros. 12AMs. There are EV XEQ crossovers on the four sidefill mixes and the drum mix. The monitor system is powered by Crest 1004 and 9001 and Carver 2.0 amplifiers.

Microphone selection is straightforward. Vocals are miked with Shure Beta 58-As. Drum mics include a Shure SM57

FOH engineer Dave Natale (L) and monitor engineer Raza Sufi

(top) and Sennheiser 409 (bottom) on snare; Sennheiser 409s on toms; AKG 460s on hi-hat, ride and overheads; and combination Shure SM91A and Beyer M88 on kick. "We use two microphones on the kick drum—I use mostly the 91A, and the 88 to get more click, depending what the room's like," says Sufi. "And Dave [Natale] tends to use the 88 more, and a little bit of the SM91. We chop and change each day.

"Their backline is simple—two guitars, two 4x12s, a bass rig and a small drum kit. They like to keep it to just their raw, bare minimum." Processing includes TC Electronic EQs, Brooke-Siren DPR 901s and a Yamaha SPX1000 on the vocal, a Tube Works tube DI and dbx 160x on bass and Drawmer DS201s on drums, with an SPX90 and a dbx 120xp bass synthesizer on the snare. "The drummer plays a DW snare—maple and brass—and he likes a really fat snare drum," says Sufi. "To tune it that way tends to be too floppy for him onstage, so he tunes it to a medium tightness, and we use the bass synthesizer to add to it. It works—you can feel the snare drum, as opposed to just hearing it, and I guess that's what he likes." Occasionally, Bush will include a string section in the show. "It doesn't change things much," says Sufi, "except that you bring a string instrument into the environment of 13,000 screaming teenagers, so it's hard to get those subtleties."

Sufi says he has made an effort in the last year to bring their onstage level down by keeping the band informed of excessive performance levels on any

given night. At the beginning of the tour, Sufi experimented with keeping the cabinets and amplifiers offstage so that the band could keep the stage level down and get a better mix in the monitors, but the band was dissatisfied with the results. His suggestion of using in-ear monitoring systems also met resistance from Bush. "Right now, their vibe is to get up there and feel that pressure. It's still very old-school, but it works for them and they don't seem to have a problem with it." ■

Sarah Jones is Mix's editorial assistant.

riding up against the feedback threshold, so you were dancing all night.

"But over the years we've been able to bring up the level of the dialog with a lot of these black boxes and better speaker design," he continues. "And these line arrays that I'm using now are a major step forward, more so than all the black boxes we've added. Everything else has been incremental—good filter sets give you 2 dB, the Dolby Cat 430 gives you another 2 to 3 dB...so gradually we've come up 12 to 15 dB on the average level of dialog reinforcement in the house from what it used to be."

Line-array technology is not new. A similar system from French manufacturer L'Acoustic was employed at 1995's Grammys and Oscars broadcasts, but when Baltzell had trouble finding L'Acoustic systems on the East and West coasts, he approached Kenton Forsythe at Eastern Acoustic Works about building some new boxes. The first set of EAW KF-860 KF-861 cabinets was used at the June 1995 Special Olympics in New Haven, Conn., the second at the Billboard Awards a few months later. The proprietary horn design was modified, and 24 boxes were constructed for Version 3 at the Grammys in February. Further modifications were made to the high-frequency horns, and Version 4 was ready by the Oscars. The system was supplied by AudioTek of Los Angeles. The goal all along, according to Baltzell, was to have a compact, powerful system in place for the Opening Ceremonies at the Summer Olympics.

"It all starts at the front cluster," Baltzell says. "Even though there are speakers up in the acoustic 'clouds,' speakers on the side, speakers under the balcony, 40 to 100 percent of the energy that any listener hears is coming from the cluster—everything else is filtered and EQ'd to supplement or fit in with that. The line array is very simply taking the energy from a speaker cluster, and it is so well-defined that pattern control holds down to 100 Hz. There is very little going to the stage.

"I don't even highpass instruments

FROM CADAC CONCERT TO HOUSE P.A.

Here is a list of the matrix outputs from the FOH Cadac Concert mix console.

Matrix 1 Out/Cluster A Left (Balcony Rail): EAW KF-860

Matrix 2 Out/Cluster A Left (Orchestra, Downfill): EAW KF-860, KF-861

Matrix 3 Out/Cluster C Right (Balcony Rail): EAW KF-860

Matrix 4 Out/Cluster C Right (Orchestra, Downfill): EAW KF-860, KF-861

Matrix 5 Out/Cluster B Center Fill: JBL2445 with 2366 horn

Matrix 6 Out/Under Balcony: Inside—(3) EAW UB842; Outside—(2) EAW UB842; Sides—(2) ATK M2 Wedge

Matrix 7 Out/Founders' Circle,

2nd Balcony: Founders' Circle, left-right fill—(2) 1152 DeltaMax; 2nd Balcony, left-right fill—(2) 1152 DeltaMax

Matrix 8 Out/Upper Balcony: Distributed Cloud System—(4) 1152 DeltaMax; Distributed Powered Speakers

Matrix 9 Out Front Fill: Inside—(4) Ramsa WSA 200; Outside—(4) Ramsa WSA 200

Aux 1/Subwoofer: Left, Under Cluster A—(2) ATK CSW218 Subs; Right, Under Cluster C—(2) ATK CSW218 Subs

Aux 2/Lobby Page System: In-house Distributed Ceiling Speaker System

Aux 3/Preshow Page System: (6) ATK M2 Wedge Speakers

now that I used to," he adds. "I used to highpass at 150 Hz before I did anything and say that's the way it has to be. Now I only highpass if we have popping, maybe at 80 or 100 Hz. There is so little lobing on these arrays, low- to mid-frequencies in particular. Systems have always been good at controlling 1 k and above, but that's not where the problem is. The problem is always below 1 k, or below 1,500. The line array gives you the same degree of pattern control at 200 Hz as at 6 k, or close to it. Now I can turn up the dialog with someone two feet off the microphone, and my limiting factor is not feedback, so I don't do all the equalization that I used to just for gain. Now I EQ for tonal distinc-

(3) ELEMENT KF 860 SPEAKER ARRAY
(TYPICAL OF CLUSTER A - LEFT & C - RIGHT)

21.75 FT FROM FLOOR

EXISTING STEEL CABLE POINT (1200 LB. LIMIT)

SPEAKER HANGING FRAME (RATED 4200 LBS.)

10.0 DEGREE SPLAY

15.0 DEGREE SPLAY

GROSS WEIGHTS:

SPEAKERS AND HARDWARE = 985 LBS.

STEEL ROPE W/ HARDWARE

15 FT FROM FLOOR

AUDIO "SIGHT LINE"

8 FT X 10 FT PICTURE SCREEN WITH BORDER

EAW KF-860 virtual line array

tion, as it should be. The limiting factor is actually reflections off the back of the room coming back into the mic, where the broadcast develops an echo or a room reflection—it's not feedback anymore, and that's a major revelation."

Room-tuning chores were handled on the Tuesday and Wednesday before the broadcast by Alexander Yuill-Thornton II (Thorny). "He has a Meyer SIM system, and he has a couple of his own systems, using an HP 3582 dual-channel FFT that he's had for ten years," Baltzell says. "He's also developed his own software called SMAART, which is going to be marketed by JBL—it's software written by him and Sam Berkow, an acoustician in New York. It's a PC-based program that with an external card will give you a dual-channel FFT, and you can do similar measurements yourself. You just need an interface like a Pro 01 to do switching. It's source-independent, and there's an acoustical module and there's a real-time module—FFT, third-octave, octave, or anything you want. He did this room on that system.

"He'll do measurements during the show, too, just touch-ups," Baltzell adds. "He'll have test mics here, up top, and down on the floor, look at those three regions and do gentle adjustments, nothing radical. Sometimes he'll lean over to me and say, 'I'm seeing a sag at 3 k to 8 k up in the balcony. Will it bother you if I fix it?' And I'll say yes or no. In the old days, when I was right on the edge with every podium and

lavalier, just starting to kiss feedback, if he did do a 3dB boost, I would get feedback. So he works with me and he'll know already that the low end is where it's getting a little loose with the dialog, so he'll gently fix it. We all know that things change with 3,000 people in the audience, and certain frequencies will sound duller, or the excitement of certain frequencies will go away. So you have to put a little back. And Thorny's the best."

The parade of presenters and acceptors at a three-plus-hour awards show—appearing either at left-podium, right-podium or a center pop-up stand—keeps Baltzell busy with minor adjustments and level-riding. Each of the Schoeps mics up front contains three elements, with CMC5 preamps: MK-4 cardioid, MK-41 hypercardioid and an omni Countryman sandwiched between the two. Master of ceremonies Whoopi Goldberg was fitted with two Vega UHF body packs (the second for backup, in case one failed), with Vega LM210 elements.

"In years past, I used to put a cardioid and an omni lavalier on Billy Crystal," Baltzell explains. "But Whoopi's not singing any songs or anything like that, and she tends to be more high-end sibilant. This room, in particular, is designed to keep the sibilant splash that is meant to keep the high end moving with lateral reflections off the walls, adding definition to the orchestra when you're sitting at the top. But with people talking on the lavaliers, that sibilant

energy tends to come back and give that 'ssshhht' sound that sounds like a splatter, or flutter, of sibilance. The Vega 210 tends to solve that problem because it's slightly directional above 2 k. Whether you call it an omni, it actually exhibits directionality at high frequencies. But you have to aim it right. You can't just pin it on like any other ECM-50 or Tram, where orientation doesn't really matter. Aim is critical, and that's the difference between having to EQ or leaving it as a natural sound."

The podium mics, Whoopi and the various live announce, taped announce, video source, film source and other cues come in on the far right 18 inputs of the Cadac live console, which was also used on the Grammy Awards. "I picked it for its compact size and the automation," Baltzell says. "It's the best-sounding board I've ever used. It rivals a Neve, which you don't usually get in a P.A. console." The 24 inputs to the left handle the live band inputs, which Baltzell mixes for the house—a split feed is sent to the Greene Crowe & Company television truck, mixed by Paul Sandweiss. A further 20 inputs to Baltzell's far left, in a wrap-around, L-shaped layout, take in the submixed orchestra feeds from David Hewitt's Remote Recording Services "Silver" truck.

Tommy Vicari, a music mixer whose credits go back 25 years but in the past few years include Parliament Funkadelic, The Winans, Ray Charles and Quincy Jones, was picked by show producer Jones to mix the orchestra. From the Sil-

ver Truck's Neve V 48-in console. Vicari sent submixes to Baltzell—Drums, Bass, Guitar, Keys 1, Keys 2, High Strings, Low Strings, Brass, Woodwinds, etc.—in stereo pairs. Except for two hours during the week before the broadcast, much of which was spent positioning and optimizing mic setups, the first chance Vicari had to get in the Dorothy Chandler Pavilion with the 47-piece orchestra was the night before the show.

"My responsibilities really began with the prerecord at Paramount's Studio M," Vicari says. "We recorded the entire show on Tuesday and Wednesday the week before, mixed it to DAT and sent it to the show director so he could use it on the staging. They used to have the orchestra here for the week of rehearsals, but they didn't do that this year, so we had some logistical problems to work out. My brother Danny worked as the liaison between me at Studio M, the truck and the house. David [Hewitt] and I had been talking for a couple of weeks before the show, and we had everybody in the pit before they physically arrived—we had the mics coordinated, 24 direct boxes and the mic selection. We had to go out and find some Schoeps MK-41 mics because we thought those would be best for the violins, but it turns out there aren't a lot of them in L.A. Then we found out ABC had some, so we put those in the pit.

"Then we went in and had the ABC prop department build small Plexiglas cubicles so the players could actually see each other while still giving us a shot at separation," he continues. "We put Sonex on the bottom and left the tops open. I think we did a pretty good job preparing for the show, in that the orchestra wasn't really here until the night before. We had to be very careful in our mic selection and positioning—like not having the trumpets blowing into other instruments; we had to position them so the woodwinds are behind them, with the French horns off to the side and the trombones in front. But the horns can't be in front of Tom Scott, the conductor, because that's very fatiguing. It's not a typical orchestra setup, but we did it this way for the house and for the comfort factor."

Vicari readily admits that his experience is in the studio, and in the weeks before the broadcast he was in constant consultation with Hewitt. The violins, they both knew, would suffer the most from contamination, and they needed a big violin sound.

"You have to start with your vulnerable point," Hewitt says. "All the leakage is coming from the drums, from the orchestra itself, from the house P.A. All these things make it difficult to have a large string sound in a live show without creating a 'swim.' Our experience has been that these Fishman pickups will give us a clean sound without a great deal of expense or trouble to the players. It takes some effort and a little finesse for the players to feel comfortable, but you can do away with leakage. They are a bit midrange-y, but in combination with the warmth of the Schoeps, they sound great."

Mixing for television, as anyone who has done it will tell you, involves a series of compromises, although most everyone involved in this year's broadcast said audio was given special consideration, mainly because Quincy was the producer. In response to the age-old live broadcast question "Are you mixing for the house or the 1 billion viewers?" Vicari said, "I'm mixing as if I'm making a record. I'm taking into consideration that it's a television show, but I'm basically mixing a record. Still, picture is king."

"Picture is paramount," Baltzell echoes, "so if they want someone far off the mic, or they want a small child on a lavalier, I can't put the mic in their hair, on their beard or hide a flesh-colored wire on their face like in Broadway makeup. It's all about the close-up, and you have to work around that—more like the movies and less like a stage performance. And by tomorrow night's broadcast, I have to try to make it seem like a show I've been doing every night for a month." ∎

changes. Hitting "control-C" captures the current settings on the console and opens the Store Scene window. The Edit Sequence window allows up to 256 songs, or "scenes," to be arranged in the order they will be performed. It shows saved songs on the right, and they can be dragged and dropped into the performance list on the left to make up the set list for the night. "If we get a call from backstage during the show, Randy Wille [Showco system engineer] can go into my performance list, remove a song by just dropping it in the trash, and I don't even have to think about it," says Colby. The main window shows the fader positions and assignments, the current cue in the list and the next cue to be called.

"I think that you get a big bang for your dollar with the Recall," says Colby, "I like all the consoles: I'm a big Midas fan and have used them for years. I use the [Yamaha] 4K for a lot of production stuff I do for TV. I like the Gambles, or any of the Mackie products for people on a budget. I think the Recall came along right when things needed that extra effort toward automation."

Kevin "Tater" McCarthy, whom Colby calls "the fifth man on a four-man crew," is stage tech, monitor assistant and helps crew chief and system engineer Randy Wille hang the main P.A. Showco's PRISM system flies four rows deep on an eight-column grid. For venues with 360-degree seating, two Showco four-column rear-fill grids are flown three rows deep. When rear-fill coverage is not needed, half of it is flown as two-column extensions to the main rig, allowing it to wrap the sides further. Six Showco PRISM sub-bass cabinets are down-stage of the side-stage extensions (*aka* ego wings), with five Showco 450 two-way front-fill cabinets arrayed across them. Two additional 450 cabinets are used for center coverage of the front rows, with a sub placed beneath them. The system is powered by 48 Crown PSA-2 and 66 MacroTech 1200 amplifiers. System drive is provided by the PRISM digital controller, with separate control for main, front-fill and rear-fill systems. In typical Showco fashion, the main system EQs are two custom Industrial Research Products DG-4023 Transverse Equalizers.

Colby uses a half-dozen tracks from various CDs to tune the P.A. "I'm listening right now to a band called Blue Nile, to Sting's new *Mercury Falling*, my old, reliable *Nightfly*, a little Peter Murphy because of the way it's recorded and the dynamic response on the CD, a little Paul Brady, Phil Collins' *Face Value*, and I listen to a bit of my own Genesis stuff," Colby says. "Then I use a Beyer M88 to check the response of the P.A." To cut down on the fatigue for the band during soundcheck, Colby doesn't turn on all 16 columns, just the inside five on each side. "Then for parts of the soundcheck, we bring up the other three columns and turn the rear fill on," he explains. "The band knows which parts of the soundcheck that happens on, I've got to prepare them for the worst."

Five Tascam DA-88s, along with a Tascam RC-848 remote control, are in a rack next to the console. "I'm not sure what they'll do with them. We're just archiving for now, but the cost of owning 40 tracks of digital was very affordable, and for an artist like Seger, it's a good investment," Colby comments. "We're able to fit the whole show on 120-minute tapes, which is about $100 an evening in tape cost." On the Recall console there's a dedicated direct output on each channel, and a switch changes auxiliary 12 to be the level control. "I unplug five multipins from the back of the rack, tuck them into the doghouse every night and I'm done,"
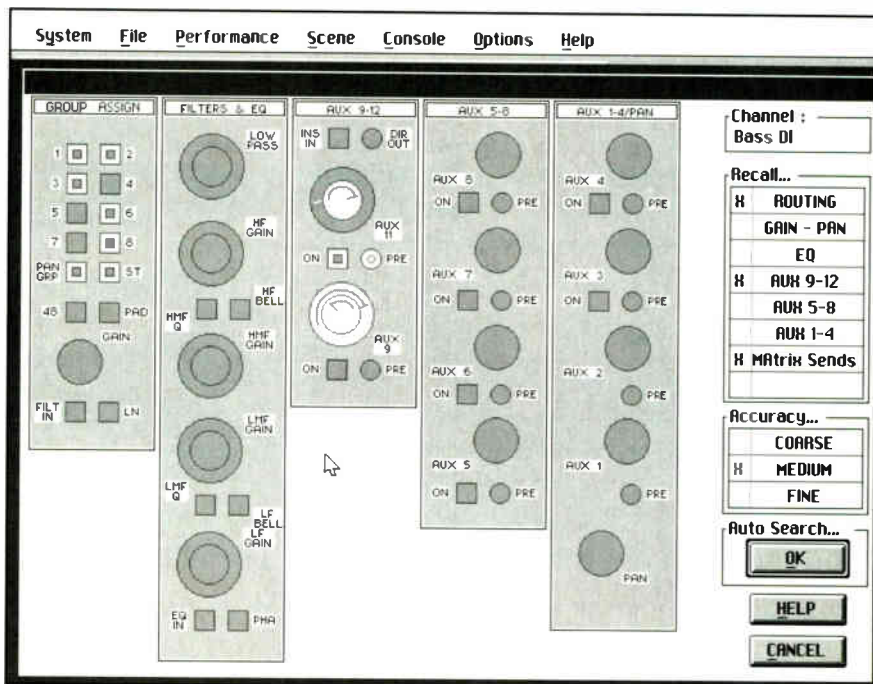
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adds Colby. "That's how easy it is."

Four audience mics are used. Two AKG "blue-line" CK-98 shotguns at the down-stage corners point straight down the room. At the outsides, pointed up at the sides of the arena, are two C-460s with CK-61 capsules. "Bob takes two tapes from me every night," Colby explains. (One tape is the console mix plus the four audience mics mixed in with a Mackie 1604. The second is a DAT, just using the Sony stereo mic that comes with the DATman.) "I don't mix for the tape—I don't set up any special aux sends or matrixes," Colby continues. "I believe that if you get your sound system set up properly, your board tapes are going to sound pretty close." Because the audience is so involved in the show, it's necessary to really put the vocal on top of the mix. The mic-only mix helps confirm that the board tape is the product of a mix that's correctly balanced for the dynamics of the room. "I wasn't offered the old board tapes, though I would have liked to listen to them. I was just told to listen to the albums, but don't forget that two of his most successful records were live, so I got a good indication there," adds Colby.

After trying a variety of both hard-wired and wireless mics, Seger settled on a Beyer NE 700 UHF wireless with a TGX-80 capsule. The other vocals are hard-wired M88s, and an M160 is used for the tambourine that the backing vocalists play. Sax player Alto Reed, one of the founding Silver Bullet Band members and the source of that signature "Turn the Page" riff, mixes all his saxes, from alto on down to a huge bass sax, with his effects from the stage, sending a single line to the engineers. "It works perfectly," Colby says. "He's into his sound and very much on top of it." Two mics are used in Kenny Aronoff's kick drum: a Beyer TG-X 50 and an M88. A Shure SM57 is on the snare, SM98s on rack-toms and Beyer M201s on floor-toms. Beyer's new MCE-83 condenser is used on the hi-hat; the overheads are Beyer's MC-834 large-diaphragm condensers, which are fixed-pattern versions of the MC-740. Guitars and bass use the Tube Direct DI, except for Seger's Boogie, which is miked with a Beyer M201, as are the Leslie cabinets. Chris Campbell's bass is also miked with a TG-X 50.

Effects include a Lexicon 480L, with one machine for background vocals and another on snare. A TC Electronic 2290 is used for vocal delays, and a Lexicon PCM-90 is used for Seger's vocal. "I really like using all the Lexicon devices, but this has quickly become my favorite," Colby says. "I'm using a preset called Good Ol' Vocal Reverb and varying the parameters for songs, whether they're ballads or up-tempo." There are also two PCM-80s—one for chorus on the background vocals and the other for a reverse-gated reverb on the toms. A Lexicon 300 with a Plate algorithm is used for a true stereo drum reverb at special moments.

Monitor engineer Randy Williams mixes on a 32-channel Harrison SM-5 with a 20-channel extender and drives 28 of Showco's new Stage Reference Monitors (SRM), powered by Crown 36x12 amps. Loaded with a 12 and a two, the SRM low-profile wedge is vertically symmetrical, allowing it to be used with the horn to either side by turning it 180 degrees. Two Showco B-1 subs augment the drum mix. Seger's mixes are equalized with TEQ ⅓-octave Transversal equalizers. There are 12 more channels of K-T EQs for the other mixes, along with a DN-60 RTA. Inserts include two dbx 900 Series racks, with

NEWSFLASHES

Southard Audio and **Soundworks**, based in Harrisonburg and Richmond, VA, respectively, each purchased a 12-stack Turbosound Floodlight system...Soundcraft reports the sale of a 40-input SM-24 sound reinforcement console, a 40-input Vienna board and a K-1 board to Michigan's **Thunder Audio**...China's **Yellow River Concert**, held late last year in Guangzhou's Tianhe Stadium, featured a choir of 15,000 workers, farmers, students and soldiers, and a 500-plus-member symphony orchestra. The concert, which was heard by 60,000 people live and an estimated 2 billion via China Central Television, employed an array of gear from **ARX Systems**: 48 ARX922 loudspeakers, 30 ARX215 stage monitors, 30 Maxisplit line splitters, 90 SX Series amps and a number of EQ60 equalizers... **Davidson Electronics** of NYC has been named the authorized repair/warranty center for Stage Accompany USA. ∎

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eight compressors—two each for bass, Leslie, keyboards and lead guitar—and eight gates on the drum mics.

Colby ends our discussion by congratulating Showco on their high level of tour support. He points out that while all P.A. companies are striving for consistency and quality, personnel is a key ingredient that is often overlooked. "I don't think it was really an issue five years ago the way it is now," Colby says. "With all the improvements in technology we now enjoy, it's only logical that the people need to be that much better."

Several songs into the set that night the *entire* audience leaps to their feet and comes alive, singing "Just take those old records off the shelf…" right over the top of Colby's mix. I guess it's true that rock 'n' roll never forgets. Now it also Recalls. ∎

VCA to emulate a gate, compressor or limiter. There are nine different algorithms, with more due to be released this year, including an expandergate. Also due to be released this year is Visual Effects software that will provide onscreen control surfaces for popular effects by Eventide, Lexicon, TC Electronic and others. The Showtime software will control and document the mix's auxiliary effects through MIDI sysex messages from the computer, which will act as a librarian.

MEYER SYSTEM
WITH CREST AMPLIFIERS

The main FOH system was essentially the same one that A-1 Audio's crew chief Dave Lawler had out with Anita Baker last year. The hang consisted of a row of two Meyer MSL-5s for the balcony, with a row of four DS-2 double-15 bass cabinets underneath, all delayed about 22 milliseconds to the backline. These were run together as a system, along with the Meyer 650 sub-bass enclosures in the orchestra pit, individually delayed in .75-millisecond increments to accomplish low-end steering. The bottom half of the hang was a row of the new self-powered Meyer MSL-4 speakers on a separate send to cover the orchestra level, with MSL-2 speakers on a third zone as front fill. Other than the self-powered MSL-4s, the system relies on Crest Touring Series amplifiers. The stage set featured lots of red 24-ounce velour, plus carpet on the risers and floor (except for the down-stage edge), resulting in relatively dead acoustics.

Lawler operated a SIM System II computer to EQ the system. At Schnitzer Hall, a late load-in due to a morning orchestra rehearsal delayed getting the first pieces in the door until 1:34 p.m. In spite of the delay, Lawler was able to perform his daily SIM chores, furiously dashing through computer menus and tweaking parametrics. Lawler has nearly perfected the art of compressing a routine that normally

in one of three performance modes (Safe, Override or Update). In Safe mode, only the computer runs the levels, and faders are not active. Override places control entirely with the faders. Update mode, usually used for automating touring mixes, loads in the stored levels for each scene, and then fader moves are used to change them. The mutes continue to operate in all three modes.

Typically, each song is recalled in Override mode, which sets the faders at zero and allows the operator to mix through both VCAs and individual faders, while at the same time resetting levels, effects and mutes, including auxiliary send 1 and 2 mutes, which are also automated. The Showtime software accepts MIDI control; a MIDI event can be programmed anywhere in the cue list, either with or without a scene change.

McAree's FOH effects include a two-machine TC Electronic M-5000 for vocals and instruments, a Lexicon PCM-70 used on lang's vocal, and a PCM-80 for snare reverb. An Eventide H3000-SE was used with an L/R delay and small amounts of pitch change, and a Roland SDE-3000A was employed for occasional vocal echo treatment. A BSS DPR-901 dynamic equalizer was inserted on the main vocal. All other dynamics processing was provided by the Amek Virtual Dynamics package, which allows configuration of each channel's

QUICKTIP

All five guitar amps on the k.d. lang tour stay inside specially designed road cases, simplifying setup and maximizing isolation on-stage. An assortment of Rivera, Fender, Vox and Laney combo amps are in custom road cases that have a hatch that comes off the back to let the open-back speakers "breathe" correctly. A lid comes off the top, and just enough of the amps are exposed to offer access to the knobs and allow the tubes to ventilate. Four extra inches of space in front of each amp allows a Sennheiser MD-409 mounted on a gooseneck to stay inside the case, and an XLR simply gets plugged in each day. Not only quick to set or strike, the package also minimizes the number of dead cases each day. The lids and hatches store under the risers, and the amps are quickly packed up and ready for the truck at the end of the night. The sound from the amps is

Rear view and front view of combo amps

consistent, isolated and natural. There is practically no bleed from the amps onto the stage or into the audience.

—Mark Frink

takes at least half a day into an hour, using seven BSS Varicurves and three BSS TCS-804 stereo delays to equalize and align the system. "You can't use a SIM in a one-off situation without using a Varicurve, because going between the computer screen and the knobs on a traditional parametric is too time-consuming," McAree explains. "Plus, you only have time to do one side of the system, and you need stereo devices to duplicate the moves to the other side. I do 60 to 75 percent less knob turning on the desk from room to room. When there's something you can't dig out with a ⅓-octave EQ, you normally start cutting with console parametrics on the most offending channels."

EAR MIXES TOO ISOLATING

Jerry Harvey, who spent the last two years out with Van Halen, mixed monitors on a Yamaha PM4000M-52 and had the entire band on 'ears,' while lang listened to 'the room,' plus a couple mixes of fill speakers. "She wants to maintain intimate contact with the audience," Harvey explains. "The ear mixes left her feeling a little too isolated." Sidefills were a pair of Meyer MSL-2s for vocal, plus a pair of A-1 Audio's single-12 wedges with band in them to give lang more of the show's feel onstage. Another BSS 804 delayed the sidefills to the main P.A., which hung several feet upstage of the proscenium.

lang's vocal mic was her familiar AKG 535, while background singers Julie Delgado and Debra Parson were using Shure SM87s. McAree split lang's vocal mic at the FOH console with a Y cable, using the second input for all vocal effects, putting them on their own fader. Randall Stoll's kick drum was miked with a Shure SM91, snare top with a 57 and snare under with an AKG 535. Ride, hat and overheads were Neumann KM84s, and toms were SM98s. Sam Sims' bass was picked up with two DIs, taking highs above 250 Hz with the second one. Larry Campbell, who has played for Cyndi Lauper, ably replaced lang's longtime band-member and collaborator Ben Mink, who is sitting out this tour due to family commitments. Campbell played electric guitar through a Vox AC30 and pedal steel into a Fender Twin. David Barry, previously from Janet Jackson's band, played smokin' electric through a stereo Rivera Ignitor, which McAree called "the best-sounding amp this

side of heaven." John Lowery played electric through a Laney; McAree took his signal clean with a DI. Electric amps were miked in their cases with Sennheiser 409s (see "QuickTip"). All three guitar players also doubled on acoustic. Musical director Darrel Smith played a Yamaha baby grand with a Lawler-modified Helpinstill pickup, a real Fender Rhodes and accordion for the signature licks on "Constant Craving."

A double-wide rack at the monitor position held substantially more processing than was used at FOH. For the speaker mixes, there were three Klark-Teknik DN 3600 programmable graphics, along with a DN 6000 RTA. Inserts included K-T DN 504 and dbx compressors, and Drawmer DS-201 gates. Also in use were a Summit TLA-100 tube compressor and BSS DPR-901 dynamic equalizer for lang's vocal. The 901 was used with slight amounts of compression at 800 Hz and 3 kHz and a wider bandwidth centered at 160 Hz. Effects included a Lexicon PCM-70 for lang's vocal and an LXP-15 for the drums. A Yamaha SPX900 was used

with its Vocal preset on backgrounds; a second SPX900 was set to Room and used for guitars. There were also four more DN 504s used as mix limiters on the band's ear mixes. Single-12 wedges with their horns turned off were used to supplement low-end information to the band's ear mixes, along with a single-18 subwoofer for the drummer.

Along with all his other setup tasks, system technician Fumi Okazaki was responsible for the modular digital multitracks used to record each performance. Backstage, next to the monitor console, a double-wide rack had a Mackie 32•8 console mounted on top, fed by a third split from the snake. The rack held four DA-88s on one side; the other had mic preamps and processing for critical inputs. An SSL Logic FX G3 and a dbx 160x were used for lang's

Monitor engineer Jerry Harvey and FOH engineer Grant McAree

vocal. A 4-channel John Hardy M-1 was used for both background vocals and two acoustic guitars. A BSS DPR-404 was used to compress snare, bass and background vocals. A Focusrite ISA 115HD was used on the two piano channels. Audience mics were AKG 451s with CK-8 shotguns at the proscenium edge and a Shure VP-88 stereo mic at the FOH mix position. ∎

Mark Frink is Mix's sound reinforcement editor.

World Radio History

New Sound Reinforcement Products

RANE GRAPHIC EQs

Rane Corporation (Mukilteo, WA) announces two new rackmount graphic equalizers, the 2-channel, 15-band, ⅔-octave GE 215 and the mono, 30-band, ⅓-octave GE 130. Both feature Rane's constant Q fixed-band-width filter design, 45mm slider controls with center detents for +12/-15dB boost/cut, front panel level controls, overload indicators and hard-wired bypass switches. Rear panel XLR and Euroblock connectors are provided for the active balanced inputs and outputs. Output relays provide turn-on delay at power up.
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SPIRIT LIVE 4 MARK II

The Live 4 Mark II mixing console from Spirit by Soundcraft (Auburn, CA) is available in 12-, 16-, 24-, 32- and 40-channel configurations, each with an additional four stereo inputs (except the 12-channel model, which has two), four stereo effects returns and four mute groups. An 8-channel expander module is available for the two smaller mixers, and the 12-channel version may be rackmounted. Mono mic inputs feature switchable 4-band EQ (two bands sweepable), highpass filter, 48V phantom power, six aux sends and Spirit's Ultramic Plus™ 66dB gain mic preamp, which accepts line level. Outputs include a 10/2 A/B matrix derived from the four subgroups, direct outs from each channel, and -10dBv outputs for recording. Prices range from $2,399 for the 12-channel model to $7,299 for the 40-channel version.
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RENKUS-HEINZ TRAP40 SERIES

Renkus-Heinz (Irvine, CA) says three-cabinet arrays of its new TRAP40 Series of three-way loudspeaker systems can provide performance equivalent to a single point source. The TRAP40/6 and TRAP40/9 systems, designed to operate bi-amplified with an associated Renkus-Heinz X220-TSC controller/crossover, feature 40° trapezoidal enclosures and provide 120 degrees of controlled horizontal coverage in a three-cabinet array. The CoEntrant design provides tight pattern control in both planes down to 500 Hz and ensures proper signal alignment and constant directivity and Q through crossover. Components include a 15-inch LF woofer crossed over at 250 Hz to two 6.5-inch cone MF drivers and a 1-inch HF driver (the TRAP42 features two 15-inch woofers). Maximum SPL is rated at 129 dB; frequency response is 40 Hz to 17 kHz.
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ACE PRODUCTS GIG BAGS

ACE Products (Petaluma, CA) offers a range of padded Gig Bags suitable for carrying and storing microphones, mixers and effects units, keyboards and musical instruments. Constructed of luggage-grade nylon with thick padding, heavy-duty zippers and sturdy handles, the KEB Series bags are suitable for small mixers and feature additional accessories compartments. Prices range from $24.95 to $54.95. The new MB-6 ($89.95) and MB-12 ($99.95) mic bags feature precut foam inserts for six or 12 mics, plus an accessories compartment and adjustable carrying strap.
Circle 215 on Reader Service Card

CELESTION ROAD SERIES SPEAKERS

Celestion Industries' (Holliston, MA) Road Series loudspeakers are virtually indestructible, the company says, thanks to a new polymer cabinet molding process that provides exceptional acoustic stiffness and light weight. The R1220, a two-way system featuring a 12-inch woofer and a constant-directivity, horn-loaded ring transmission transducer, will handle 250 watts and weighs 27 pounds. Two other full-range systems, the R1520 (single 15-inch woofer, 300 watts power handling, 29 lbs.) and R1522 (dual 15s, 500 watts, 46 lbs.) feature a 1-inch compression driver on an exponential horn. The R1542 is a dual-15-inch woofer system (500 watts, 44 lbs.). Full-range systems are passively crossed over and feature protection circuitry; all Road Series speakers feature Neutrik Speakon® and ¼-inch connectors.
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Russell and Nathaniel Kunkel

FAMILY HARMONY

I n this Lunching, we are going to investigate two success stories linked by blood. The father, Russell Kunkel, is a renowned drummer, songwriter and producer with a brilliant career spanning more than a quarter of a century. The son, Nathaniel Kunkel, has already proven himself at an early age as a top engineer.

Born in Pittsburgh, Russell started as a professional musician in the heyday of '60s California music. Early triumphs as a session and touring drummer with James Taylor, Carole King and Jackson Browne led to songwriting and eventual success as a producer with Aaron Neville, Carly Simon, David Crosby, Dan Fogelberg and Jimmy Buffett, capped off this year with Buffett's *Banana Wind*.

Join us now for a cappuccino in the enchanting gardens of L.A.'s Conway Recording Studios. Nathaniel has just finished the Lovett project, and Russell has just returned from Nassau and Key West and work on the Buffett album.

Bonzai: Russ, when did you first come to California—the '60s?
Russ: I actually came earlier than that, around 1958. But I pretty much grew up, junior and senior high, in Long Beach and Southern California.
Bonzai: How was that a formative time for you?
Russ: There was a prevailing feeling in the '60s, along with all the music and the great things going on, that you could accomplish just about anything you set out to do, if you meant it and cared enough. The Beatles were an influence on me in that direction—their music was so good and so different that I was suddenly aware that a human being could achieve those kinds of musical heights. It was inspiring. I would actually sit down and think I could almost

Russell and Nathaniel Kunkel

play as good as Ringo if I really tried.
Bonzai: And you were a drummer at this time?
Russ: Yes, I was, and my brother played drums. His bands always rehearsed around the house while I was growing up. When I was about four years old, he sat me down at a snare drum and put the sticks in my hands. Whenever I was interested in learning, he would show me something new. When I got to elementary school, I joined the band.
Bonzai: Why do you think you were drawn to the drums?
Russ: I guess it was because I had a jump on it, and I had a brother who was a drummer, and there were drums around. My first summer job was at a gas station, and after that experience I made a decision that I would never work a normal job again. I decided to become a musician. Getting that first $50 for playing one night—that was for me.

BY MR. BONZAI

Bonzai: When did you first feel that it was becoming a reality?
Russ: I played in a lot of bands in high school, and one of them made it to Hollywood. We played the Whisky-a-Go-Go for a few weeks in a row. That was a pretty big deal. The band was called Things To Come, about 1967, and we opened up for Cream. Beyond that, the biggest thing that happened to launch my career was being hired by Peter Asher to play on James Taylor's first album, *Sweet Baby James*. There was a domino effect after that.
Bonzai: Interesting Beatles connection. Wasn't James Taylor the first artist signed to Apple?
Russ: Yes, he was, and Peter was on the A&R staff.
Bonzai: James Taylor's *In the Pocket* album has this great photo of about 30 people—the bell-bottoms are so outrageous.
Russ: Big lapels, collar out. It was a Tom Jones kind of time.
Nate: [Laughter]
Russ: Are you laughing with me or at me?

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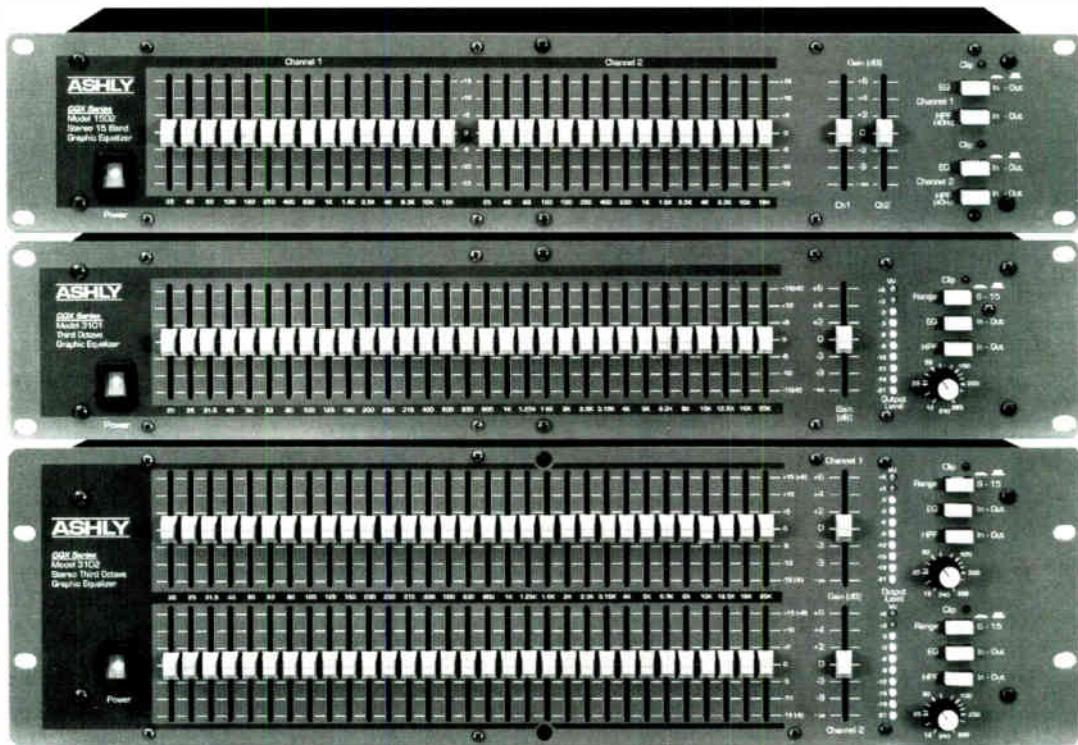
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World Radio History

Nate: With you, with you.

Bonzai: From that period, what work are you most proud of?

Russ: Early '70s? Well, the first album with James. When I listen to that, I still like it for its rawness, and acoustics. And Carol King's *Tapestry*, which I played on a good portion of. And Jackson Browne's first album, *Saturate Before Using*. Those albums stick out for me—pinnacle albums for those artists, and I was fortunate enough to play on them.

Bonzai: Were you writing at that time?

Russ: Very little. I wrote some songs for the band I was in, but I was really concentrating on being a drummer.

Bonzai: Did you have any heroes in the drum world?

Russ: Ringo for sure. What I heard on those records was great, groundbreaking stuff. And, of course, I think every drummer has respect for the jazz greats: Elvin Jones, Buddy Rich, Roy Haines and down the line. At that time, I was in awe of the session drummers in Los Angeles: Hal Blaine, Jim Gordon. I met Jim Keltner at that time when we were both just getting started.

Bonzai: How did you move on to become a songwriter?

Russ: Well, I was working for people who were great songwriters and I started to learn about the business. It's great to be a musician, great to make records and go on the road, but if you write the songs, it opens up a whole new world, financially and also creatively. I knew I didn't want to become a singer, so I felt that writing was for me. I was inspired by the people I was working with, and the more I was around them I began to feel strong enough to go ahead. None of it was very good, but I was started.

Bonzai: Have you had any big hits?

Russ: One song that got some notoriety was written with Jackson Browne and Danny Kortchmar: "Tender Is the Night" from *Lawyers in Love*.

Bonzai: Do you write music, words?

Russ: Mostly lyrics. I feel comfortable

> **It's great to be a musician, great to make records and go on the road, but if you write the songs, it opens up a whole new world, financially and also creatively.**
>
> **— Russ Kunkel**

with that, and I love cowriting and working with people who have the music covered.

Bonzai: You just finished working with Jimmy Buffett, someone who brings literary credibility to the wasteland of rock 'n' roll...

Russ: He is definitely a writer. He works on it all day long. He's on his computer more than anybody I know. Writing books, Broadway plays, songs for the next album, keeping a diary. He's writing all the time, and he's very good.

Bonzai: He's also a pilot—didn't his plane recently get shot up?

Russ: And he writes about that. There's a song on the new album called "Jamaica Mistaica."

Bonzai: Well, we've covered drumming

and writing. How about your career as a producer?

Russ: I'm 47, and somewhere along the way I realized that I didn't want to be 50 and have to go on the road to earn a living. I've been in the studio with some of the best producers around and seen how they work. I've learned what is needed. Not to put anybody down, but I've been in situations where I felt my ideas were equally as good, and I might have been able to get them accomplished faster. I decided that being a producer was a logical extension for me.

Bonzai: When did you first feel you had succeeded as a producer?

Russ: Before I started to work with Jimmy Buffett, I had co-produced a few projects. Two or three film scores with George Massenburg and Bill Payne, an album for Carly Simon, an album with Jimmy Buffett and Mike Utley called *Hot Water*, a song with Bonnie Raitt, and I co-produced *Exiles* with Dan Fogelberg.

I don't think it was until I produced Jimmy's *Fruitcakes* that I really felt like I knew what I was doing. He hadn't had an album out in six years, and that one went straight to Platinum. It was a turn-ing of the corner for him, and he let me know that I was part of the reason why. That was the moment for me.

Bonzai: Could you tell us about this recent adventure with Jimmy in the Bahamas and Key West?

Russ: It's called *Banana Wind*, which is a wind strong enough to blow the bananas off the trees, but it isn't quite a hurricane. We did this album much like the last one, *Barometer Soup*. When it was time to start that album, Jimmy was in the middle of writing the music for the Broadway show, *Don't Stop the Carnival*, which is brilliant. It was taking up a lot of his time, and he and I had the idea to put together a little core writing group consisting of the players in his band, myself and him. We set ourselves up in Key West, and the writing group would write Monday, Tuesday, Wednesday and Thursday. Jimmy would come down for the rest of the week to edit everything we had done. When he came down, he really worked. We'd be thinking we had something great, and he'd come down and make it all better. He'd say, "We gotta Buffettize this," and it would often become more humorous, and we'd all end up liking it better. We tended to take it too seriously and he'd come down and lighten things up.

I learned so much about song writing from watching the way he does it. For *Banana Wind* we worked in a similar way, with a core writing group, but Jimmy had a lot more time to devote to the writing of this album. It really shows—his fingerprints are all over it. All we did was create an atmosphere, come up with some music, and play.

I watched him sit at his computer while we were vamping on some changes, and in eight minutes he wrote all the lyrics to "Cultural Infidel." And while he's typing, he's laughing hysterically. "Wait'll you guys hear this," and we'd stop. He'd say, "Keep playing, keep playing—turn the tape on." He'd turn around and sing it. In fifteen minutes, the song was done. That's how the album was made.

Bonzai: Are you drumming on this album?

Russ: No, just producing. The drummer in his band, Roger Guth, is a fabulous drummer. His whole band is wonderful.

Bonzai: Let's move on to Nathaniel. I guess you started out in California?

Nate: Yes. I was born in North Hollywood.

Russ: And he was driven home in a 1957 Chevy station wagon that he now owns.

Nate: For my 24th birthday, Russ gave me that car, a '57 210 with a 10-foot Stewart longboard in it, wrapped with red ribbon.

Bonzai: And how old are you now?

Nate: 25.

Bonzai: The car is older than you, and I bet some of the microphones you use are older than you...

Nate: Almost all of them.

Bonzai: What was life like around the Kunkel household as a kid? What's your first musical memory?

Nate: I remember being in the basement of our house when Russ had a 4-track studio set up. He and Danny Korchmar were working there. I also remember crawling underneath the console in the main room at Record One and sleeping. These are some of my first memories.

Russ: There were people a lot older than you who fell asleep under that console, for different reasons though.

Nate: Maybe they were looking for something and they just fell asleep.

Bonzai: Did you feel that you had a musical calling as a kid?

Nate: Musical, yes. I play drums as well and have since I was about four. It wasn't until around 1985 that I got really into audio though. In grade school I was very interested in technology and lighting, and when I would go on the road with my dad, I was really interested in the lighting board. It wasn't until I met George Massenburg at the Complex when Russ was working with Bill Payne on some films that I really got into it.

I remember George typing SMPTE numbers into an Eeco Synchronizer—seemed big as a washing machine. I liked that. I thought to myself, this is cool, this is hip stuff.

Bonzai: How old were you at that time?

Nate: The summer of 1985, I was just out of 8th grade when I met George. The very next summer, just before I got out of school for the year, I was speaking with Greg Ladanyi on the phone. At that time, Greg and George owned the Complex. Greg offered me a job—running basically, but I didn't have a driver's license. I was just there and would do things like clean the snakes when they came in off the road, clean the connectors, solder patchbays. There

was a great technical staff, and I learned how to wire and all that.

After vacation, I would go back to Massachusetts where my mom lived and go to school, and then come out here for the summers. I did that until my senior year, and two days after I graduated, I was on a plane and working at the Complex. That was a great time. The second year that I worked there was when I really started to learn. I was living at George's house, and Russ was on the road. I got my learner's permit, and George taught me how to drive.

What was cool was that he was doing so much R&D for GML. At the end of the day he would go, "Great,

My secret is not so much a secret. When anyone asks me how I did something, I just tell them that I do what George Massenburg taught me to do.

— Nate Kunkel

you go in there and mix because I have to watch the logic analyzer hooked up to the automation computer while it's working." He'd put a mix up and say, "Don't touch any of the EQ—go for it." I would mix and mix and mix.

Bonzai: So George was your mentor?
Nate: Unquestionably. I spent a lot of time with George, and I was close with him until that fourth summer, when he ended up leaving the Complex. Greg stayed, and Art Kelm was running the studio, and in his mind I was not quite ready to be put in a room as an assistant because I was young. He told me I was capable, but I was just too young to put me in the room.

Two days after I had that conversation, Ed Wong from Jackson Browne's studio called me and offered me a job. I worked there for a year or so, and then George offered me a gig assisting him on the new Little Feat record at Skywalker Ranch. From that point on we worked together.

Bonzai: What was your first solo gig?

Nate: The first record I did solo was Lyle Lovett's *I Love Everybody*.

Bonzai: I just heard some cuts from his follow-up, the new album, *The Road to Ensenada*. "Long Tall Texan" with Randy Newman has such a great guitar sound. What was your secret to get that ol' guitar sound?

Nate: Actually, my secret is not so much a secret. When anyone asks me how I did something, I just tell them that I do what George taught me to do. It was a C-24 on Lyle's guitar. I run the C-24 up the neck, not up and down, so your left-right is the top and the bottom of the guitar. It's as if your head was kinda sideways. His vocal mic is a large part of that sound, too. He plays and sings at the same time, and all of his vocals are keepers. I use a U67 on his vocal. Because there is so much leakage, I don't really try to isolate the vocal and guitar. I just try to get a good blend going. I use the C-24 in M-S and fudge that around, making the guitar and the vocal sit right in an image.

Russ: So how do you punch in vocal parts?

Nate: You punch the guitar and the vocal, which is really difficult because Lyle moves so much, and a large part of it is just being on top of things. Move closer, lift the head of the guitar a little, or to the side, lift your head up.

Bonzai: Sounds very athletic...

Nate: Very athletic for both of us. But we've done some great fixes and Lyle is an incredible professional at that. He is able to put himself right back where he was.

Bonzai: So that's two of his albums in a row for you...

Nate: We get along well. By the end of this record we had our dynamic really worked out. He knew what to expect from me, and I knew what to expect from him.

Bonzai: Did you also mix the TV special?

Nate: Yes, we're just posting the Disney special today.

Bonzai: What's the challenge of taking what's great on a record and making it fit the TV medium?

Nate: Mixing for TV is just different. I've mixed a couple of *Austin City Limits*, and that taught me a lot about mixing for television. You have to mix with a more limited dynamic range, and it has to be a little edgier. I like natural-sounding recordings. When I was coming up as an engineer, I used to listen and go, "It's so bright. When I mix records it's not going to be that bright." After mixing for a few years and getting things to compete on television and on the radio, I realized you have to push the envelope in that way. For TV, you have to get things right up there on the edge, getting your levels real hot and getting things bright. Weird answer, I guess. The most difficult thing is to get it to cut through a speaker and sound like music.

Bonzai: Won't that change with increased dynamic ranges, 24-bit recording, fiber-optic cable and new deliveries like DVD? Are you anticipating that?

Nate: Yes, eagerly. Technically, there isn't such a bottleneck in getting quality audio delivered on a video medium in terms of the equipment they use. The problem is that it all goes through an infinity-to-one dbx 166 stereo limiter as soon as it leaves the VTR at the television station. And it doesn't matter if they digitize it at 16-bit or at 24-bit before they send it to the dish. What they do at the post house or that station to make it match levels with that commercial right before is the larger part of

World Radio History

what influences the sound. It can end up very different—I've mixed things and I hear them on one station and they sound completely different on another station.

Bonzai: For you as an engineer what is the most difficult—piano, voice, violin?

Russ: My kick drum?

Nate: I'd say that of all the techniques that I have, the one for piano is the one that I am most willing to change. There is no instrument where I go, "Oh God, I have to record…"

Bonzai: Well, how do you record a piano?

Nate: With a C-24 M-S. I open up the piano lid, and I have the piano player play and I move my head around inside the piano until it sounds good. I mark where the center of my eyes are and put the center of the front capsule there.

Bonzai: Have you recorded your dad?

Nate: Yes, a bunch.

Bonzai: Is his kick drum a problem? [Both laugh]

Bonzai: This must get into some interesting family dynamics...

Nate: Actually, on Lyle's last record, I was looking for more of a pillowy kick drum sound. Russ played on Lyle's last two records, so we worked together on both of them. It was a great help for me on *I Love Everybody*, because it was my first album, and I was so nervous. Having my dad on the session was great—I could stall for time.

Bonzai: Could you point out a few engineers who inspire you?

Nate: I am consistently in awe of mixes by Ed Cherney and George Massenburg. I hear things that George does that just blow my mind, and the same with Ed. There's a warmth and a texture that Ed gets.

Russ: His mixes are just like he is, warm and friendly.

Bonzai: Your discography, Nate, has one unusual artist: Lynni Teekrem…

Nate: She's a Norwegian mariachi singer, and she sings in Norwegian. Lynni heard Linda Ronstadt's mariachi records that George recorded, and she came here to record with that band. They called me because I had worked on the records, and it turned out to be one of the most amazing things I've worked on.

Bonzai: Russ, in looking at your child growing up, and seeing where he is now, could you pinpoint something you provided for your son? What was most valuable?

Russ: First of all, I think Nathaniel has done a phenomenal job coming from a "broken home," which is true of many kids. I didn't come from a broken home, but I lost my father when I was very young, and it's a hard thing to bear in either case. When you have children, you need to take that seriously and be there for them. Nathaniel has done a wonderful job on his own. He learned at an early age the value of having a job. If I gave him anything, it was that. I really wanted him to know the value of earning a living.

He was bussing tables at a restaurant in Martha's Vineyard when he was technically too young to work. We snuck him in, and that first summer he made $300 per week. I told him he could do anything he wanted with the money. You can put it in a bank, which is what you should do, for school. But it's yours and you can do anything you want. Well, he bought all of his friends presents. He went out to dinner, bought himself some clothes. He was generous with that money. He loved having money in his pocket and being able to buy his girlfriend a sweater and not have to ask anybody for the money. He learned the value of being responsible and that having a job equals freedom.

Bonzai: Let's look at the flip side of the coin. What was the most valuable thing your dad gave you? What makes you stand tall today?

Nate: To find that I would look back at the conversations I've had with my dad, the ones that stick in my mind as being important. It has to do with diligence, staying with something, committing yourself and following through until the end. It means completing what you said you would do, in terms of records. When it's done, all that will be remembered is how the record sounds.

My dad taught me to follow through, stay consistent, and to always do your best. When I think of Russell's reputation in town—so many people have worked with him and everybody asks me about him, pretty much everybody feels the same—he always gives 100 percent when he shows up at a session, and it doesn't matter if the song sucks or the producer doesn't know what he's doing. He's right there and gives them the best ideas that he can. That ethic is the one that has done me the most good in engineering, because people know that it doesn't matter what the budget is—I'm always gonna give them everything I can. ∎

Roving editor Mr. Bonzai learned everything he knows from his dad, the well-known taxidermist.

AMS NEVE LIBRA
DIGITAL MUSIC-RECORDING CONSOLE

Someone recently suggested that we are now firmly in the age of the third-generation digital console. The first generation was little more than technology prototypes, where the learning curve was steep and often at the studio's expense. The second generation was the large up-market boards that meet demanding specifications while trying to include nearly every feature you'll ever need. The third generation runs parallel but recognizes that there is a demand for digits in mixing at every level of pro audio activity. The high and low ends of the spectrum have been addressed; here's the beginning of the mid-market.

The AMS Neve Libra, starting at around $300,000, is a digital music-recording console aimed firmly at that middle market. It's ideal for applications that don't need vast numbers of inputs or every possible digital feature but still require optimum audio quality and full automation. Libra will be available in standard 24- and 48-fader frame sizes, but other configurations are not ruled out. The smaller frame would be ideal for project studios and tracking or off-line prep rooms in studio complexes, while the larger frame could fulfill main console duties.

This is the first product from AMS Neve that shows the combined influence of their separate company pasts. Elements have been drawn from the Logic Series and the Capricorn digital consoles such that if you come to the Libra from either direction, it will seem familiar. But even those who have never met either board will find Libra quite easy to come to grips with. Internally, the A/D converters are the same as in Capricorn, while the processing boards are Logic SSPs.

Libra is essentially an in-line design and is relatively compact. From the operator position on a 24-frame board, almost every control is within reach. The channel strips are split equally either side of the central panels, which house the automation, signal processing and general console controls. The two high-res TFT screens have differing roles—the right-hand screen principally handles routing while the left one is predominantly for automation functions.

The channel strips contain the basic familiar controls—motorized faders, cut and solo, output routing of the channel (bus or direct), channel automation switching, pan control and an assignable control switchable between monitor and any control. It is possible to flip whatever is on the control to the main fader either locally or on a global basis. Electronic scribble strips identify the channels and the role of the assignable control. Alongside all of the level controls are automation status indicators that emphasize the total automatability of every console function. It is also possible to set up VCA grouping functions from the channels by selecting the desired master fader and simply touching the faders of the slaves. The channel fader legends then display the appropriate fader's status.

Immediately above each fader is an Access button, which assigns all the processing ability of the central section to that channel. Running down the side of the fader are

BY KEITH SPENCER-ALLEN

APPROPRIATE NAMING

I've always had a perverse curiosity about the names manufacturers assign their products. The Libra moniker was apparently chosen because it reflects the music-recording relationship with the Capricorn. However, for those of us who like to read more into names than intended, the Zodiac sign of Libra is a pair of scales in balance, which could easily be seen as a reference to the balanced combination of AMS Logic and Neve Capricorn influences in a single design. Also, Libra is the 7th sign of the Zodiac, and this is the seventh marketed digital console from the combined AMS and Neve heritage. There's even more synergy at work here, but I'll call a halt while noting that Libra is one of the few signs of the Zodiac that has a convenient but little-used adjective—Libral—which is bound to cause confusion should you ever get to use it.

—*Keith Spencer-Allen*

DEVELOPING LIBRA

The Libra concept began about two years ago. With a range of four digital consoles established, AMS Neve figured they were well-versed in the introduction of digital boards. The company determined that there was, however, a spot for a midrange music recording console that filled a slot under Capricorn. A cheaper Capricorn wasn't an option, as its digital engine could not be shrunk in all dimensions. It needed a fresh approach.

AMS Neve managing director Mark Crabtree, who recently purchased the company back from Siemens, was looking for a mixer to set up in a small studio at home for his sons. "I took an AMS reverb home, and we had an old analog mixer," Crabtree says. "I hadn't used the RMX much since I designed it, so we had a lot of fun. I started looking around for a better mixer and began thinking about what I really wanted. I needed automation, and perhaps it should be digital..."

He spent a long night sketching a design, starting with the Logic 3 concept and adding bits from the Capricorn, such as the Assignable Facilities Unit, to develop "something I would like to use—targeted at me."

The development continued as other criteria were added. Screens would be used for display information, but they should be kept close to the operator with the controls arranged around them. The company's experience showed that large consoles with screens at a distance were tiring for a user, as the eye had to keep refocusing. Other features were taken from the Capricorn, such as the double-push buttons, while the Logic Series provided the Logicator controls. These components were blended to create a console that may draw heavily from these existing products but is a distinctly separate entity.

For automation, the established Encore system was chosen. AMS Neve seems very much aware that they have had more automation systems than most companies, and so it seemed wise to standardize Encore.

Affordability was also a factor, and to this end, the basic Libra units can be relatively simple—the customer just needs to specify how much they want in the way of mic amps, processing and interfaces. There was also a desire that the console should be usable out of the delivery box, and so it arrives ready for use with preprogrammed setups that the user can modify as needed.

—*Keith Spencer-Allen*

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illuminated indicators of the central functions employed on the channel.

Before leaving the channel strips, it is worth noting that on a 24-fader frame, each of these strips controls a main signal path, a monitor path and a sub layer—a third path that may be used for effects returns or other inputs. All paths can have full processing as required, which means that even a 24-fader frame can handle 72 inputs for mixdown.

CONTROL CENTRAL

The upper central panel is known as the Assignable Facilities Unit and is related to the Capricorn AFU. The facilities are comprehensive and are an excellent argument for the power of assignability. Through the AFU, each knob has a single function—there are no multiple functions, which means you can use them intuitively without having to look closely first.

The most accessible AFU controls are the 4-band parametric EQ and dynamics section, with expander/gate, compressor and limiter sections and a separate sidechain control. Further features include twin filters, full surround panning, 16 aux sends and a general control panel that offers facilities such as analog gain, trim, delay, mic/line, phantom power, phase reverse, insert and general porting controls. It's possible to set up any channel as stereo, and A-B M-S selection is included with a width control in the far corner of the AFU. To reduce confusion, a readout at the center of the
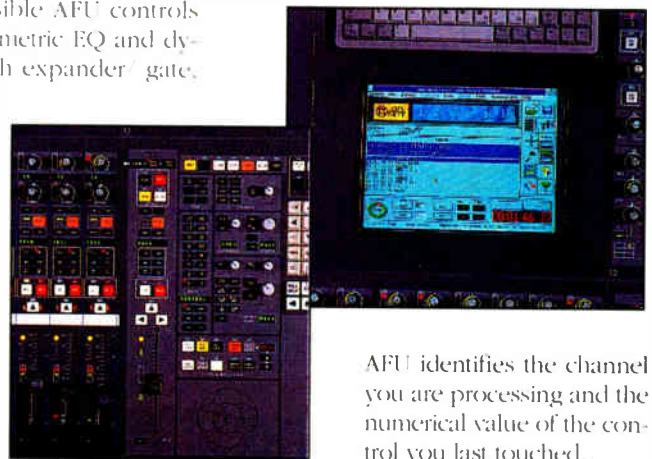
AFU identifies the channel you are processing and the numerical value of the control you last touched.

Below the AFU, to the left-hand side, is a master channel that resembles a channel strip but with a few more controls. The engineer has the choice of either operating the fader strip controls from the allocated channel or from this central panel. It follows the AFU, and together they have

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gained the nickname "The Big Channel." In practice, this means that aside from being able to set up initial mix levels on the individual channel faders, the user doesn't actually have to leave this central panel, as all processing and channel adjustments can be performed from the monitoring sweet spot. The rest of this lower panel is dedicated to central facilities, master controls, global automation controls and transport controls. The mouse lurking in the lower section is a radio-type, which is slightly ironic considering the lengths that digital equipment manufacturers have to go to meet RF emission/protection regulations.

This section also contains a Help button. Select this, touch a control for which you want info, and a help message rolls across the electronic scribble strips. This online manual should give a degree of confidence to new users.

The routing screen displays input/output matrix, with the buttons surrounding it allowing for easy routing control. The user can also interrogate the screen to show complete signal paths with fader levels. Above the screen are 16 LED meters for the console outputs and buttons for the record-arming of multitrack channels. Outputs beyond 16 are selectable to the meters alternately. Should this metering not be sufficient, there will be an option of a fully featured meter bridge. By centralizing the routing, it has been possible to create a quick and clear method of ascertaining routing status that aligns with output meters and the control buttons. Finally in this section, and looking slightly out of place, are two assignable VU meters.

In the far right-hand corner of the board lie the master group, aux faders and main output faders. It is possible to locally select precisely what functions these strips will control, but they have many of the features of the standard channels strip including the ability to access the AFU.

AUTOMATION

Libra uses the company's established Encore automation system, which includes modes of operation to make the system seem familiar to users of Flying Faders or other manufacturers' systems. Mix data from Encore sessions on other AMS Neve consoles can be transferred to Libra, depending on the data storage device.

Encore's Total Dynamic Automation allows control and reset of every console function (the user can also opt for the use of snapshot-based automation, or mix the two). An operator can also select which controls, on a function and channel basis, are to be dynamically automated at any stage in the mix without having to write that automation function on every channel. The left-hand screen displays full automation data in a variety of ways but can also be used to display signal processing EQ and dynamics curves, signal processing paths and timecode functions.

A QWERTY keyboard is included for naming channels and other functions. The far left-hand corner is currently blank but is available for user-specified options such as special monitoring or pan joysticks.

All of the processing electronics are stored in external racks. The mic/line racks are available in banks of 16 channels that will select between mic or line inputs. These can be positioned on the studio floor or remotely in the machine room. The analog converter racks are all 20-bit and link to the main processor rack using MADI. This allows the processor to double as a router, removing the need of a patching system. All internal processing is 32-bit floating point.

A variety of other inputs are allowed for—analog, MADI, AES/EBU and a choice of modular digital multitrack standards. All digital interfaces are 24-bit resolution. AMS Neve has recently introduced a MADI-to-TDIF box containing buffer memory that will aid the interfacing of multiple MDMs to digital consoles with MADI interfaces by holding them in phase-lock when they are trying to synchronize to both word clock and timecode.

The Libra is an interesting development, as it takes the quality and automation control associated with high-end digital consoles and, with what seems to be very little compromise (other than a smaller footprint), brings it to a market level that directly challenges mid-range analog boards. Some may feel that the assignability functions are not for them, but the implementation of concepts from Capricorn and Logic consoles has created a hybrid that is intuitive and far from intimidating. It's difficult to determine whether Libra is just the beginning of the digital console middle market, but it is certain to be a major influence on its future. ∎

Keith Spencer-Allen is a freelance writer based in London.

PREVIEW

Note. We inadvertently omitted the Groove Tubes Dual 75s from the "Top-of-the-Line Studio Amps" article in our May issue. Here's what you missed:

GROOVE TUBES DUAL 75S

The Dual 75s from Groove Tubes (Sylmar, CA) is a pro 2-channel tube power amp available with a variety of output tubes to suit multiple applications. Supplied standard with the Groove Tubes 6550A, the D75s produces at least 75 watts/channel. At least ten currently available tube types will work in the D75, each producing different power outputs and sonic characteristics; e.g. 6L6C tubes will produce 45 WPC, EL34Bs output 65 WPC. Front panel metering is via a cathode ray VU-TUBE with switchable sensitivity. Other features include locking input controls; stereo/mono switch; separate A and B channel standby, power switches and fuses; and an output impedance selector for 4/8/16-ohm loads. Price is $1,800, including user's choice of matched tubes.

Circle 226 on Reader Service Card

UPTOWN SYSTEM ONE

System One from Uptown Automation (Boulder, CO) is a PC-based, modular moving-fader automation system that interfaces with any console or patchbay. The system consists of one or more System One Fader eight-packs, groupable for a maximum of 64 faders; a computer kit, which includes interface boards, software and manuals (system requires a 486 or Pentium PC and runs under DOS); power supply, one for each eight-pack; and audio interface cables. System One is derived from Uptown's System 990 pro studio automation, with many of the same features. Each eight-pack has conductive-plastic-track motorized faders, but is available with P&G 3000 Series faders. A basic 8-channel System One is less than $5,000.

Circle 227 on Reader Service Card

SHURE PHONO CARTRIDGES

Shure Bros. (Evanston, IL) has introduced four new phono cartridges, all with diamond styli and mounting hardware for most tonearms (two models will fit P-mount tonearms). The top-of-the-line M111E has Shure's Dynamic Stabilizer shock absorber and Side Guard Protection system. Designed to tolerate tracking forces of 4-5 grams and back-cueing or "scratching," the SC36C is suited for DJ and broadcast use. Cartridges are priced from $24.95 to $99.95.

Circle 228 on Reader Service Card

DORROUGH LOUDNESS METERS

Dorrough Electronics (Woodland Hills, CA) has announced a new generation of loudness meters. The new 40, 12 and 400 series meters are equipped with XLR and computer-style connectors and feature user-programmable alarms that may be triggered by audio dropouts, overdriven levels or other undesirable operating parameters. The LED meters may be configured to measure levels on individual channels or the sum of two channels.

Circle 229 on Reader Service Card

SPIRIT FOLIO SX 4-BUS MIXER

The Folio SX from Spirit by Soundcraft (Auburn, CA) is a portable 12-channel/4-bus mixer for live sound and recording applications. Featuring 12 Spirit UltraMic preamps, which accept mic and line-level inputs, plus an additional four stereo line input channels (for a total of 20 inputs), the Folio offers 3-band sweep EQ, three aux sends and 100mm faders. In addition to the stereo mix bus, eight direct outs are available, as well as two subgroup outs and a mono out. The unit may be used tabletop or mounted in a 10U rack.

Circle 230 on Reader Service Card

WAVES REVERB PLUG-IN

TrueVerb is a new plug-in for the Pro Tools environment from signal processing software developer Waves (Knoxville, TN). Offering 24-bit digital resolution, TrueVerb simulates natural-sounding rooms by means of its two sections, a room

PREVIEW

simulator and a reverb section, which may be used together or separately. Users may define and modify room size, frequency response and apparent distance from the sound source. TrueVerb is priced at $800.

Circle 231 on Reader Service Card

AMEK SYSTEM 9098 PREAMPS

The System 9098 Remote Controlled Microphone Amplifier (RCMA) from Amek (U.S. offices are in North Hollywood, CA) is a 4-

channel mic pre with analog and optional digital outputs. Each RCMA mic channel has a gain range of 66 dB, adjustable in 6dB steps (with digital output option fitted, gain is 71 dB in 1dB steps) and features phase reverse, phantom power, ground lift, mute and monitor functions. The input section is identical to that on the Rupert Neve-designed Amek 9098 console. Selection, naming, grouping and gain-setting for each channel is effected via an LCD readout, cursor keys and a multifunction rotary

control. Up to 16 setup configurations may be stored and recalled. The optional digital output replaces the distribution circuitry and provides 20-bit, 64x oversampled AES/EBU output; both analog and digital outputs are available simultaneously. Up to 16 RCMA units can be remotely controlled at one time.

Circle 232 on Reader Service Card

OPTIFILE 8-BUS AUTOMATION

DRAX Automation from Optifile (distributed by Sascom, Ontario, Canada) is designed to offer SMPTE-based automation for all popular 8-bus consoles. Installed internally and using existing faders and mutes, DRAX requires no external fader pack and does not use console inserts. Priced at $2,995 for a 32-channel system.

Circle 233 on Reader Service Card

STEWART PRO REFERENCE AMPS

Stewart Electronics (Folsom, CA) announces its Pro Reference™ Series amplifiers, single-rackspace units featuring convection cooling,

polished chrome face plates, gold-plated I/O connectors and a five year warranty. The Pro Reference amps 1000 and 500 are priced at $1,099 and $799 respectively. All Stewart amplifiers are based on the company's high-frequency switched-mode power supply and include a harmonic shift correction circuit to minimize the audibility of harmonic distortion.

Circle 234 on Reader Service Card

BSS DPR-901 II

The DPR-901 II dynamic equalizer from BSS (Northridge, CA) adds two significant functions to the original DPR-901: a Split Band switch allows the 4-band frequency-sensitive compressor expander to be split into two 2-band devices; and a Sidechain Monitor feature allows the user to tune in each compressor/expander section to exactly the frequency required. Price is $1,549.

Circle 235 on Reader Service Card

REQUISITE Y7 TUBE PREAMP

The Y7 Tube Preamplifier by Requisite Tube Audio Engineering (Glendale, CA) is a pro studio tube preamp designed to accept mic, line and instrument inputs; outputs are +4 balanced and

-10 unbalanced. Front panel controls for the 2U rackmount device include mic/line input select, phantom power, -20dB pad, output attenuation and phase reverse. The CELL-BIAS™ circuitry eliminates local feedback in the first gain stage, and the design features point-to-point hand wiring, Jensen transformers, polystyrene and polypropylene caps and gold switches. Three configurations are priced from $1,800 to $2,500.

Circle 236 on Reader Service Card

APOGEE FC-8 DIGITAL FORMAT CONVERTER

Apogee Electronics (Santa Monica, CA) announces its FC-8 digital format converter, which allows 8-track digital transfers between ADAT and DA-88 modular digital multitracks. The FC-8 includes a DB-25 connector for bidirectional Tascam Digital I/O Format (TDIF) and optical interfaces for ADAT in/out. A BNC connector allows output of word clock to a DA-88 in slave mode. The FC-8 is fully bidirectional, and either machine can be master or slave. Price is $495.

Circle 237 on Reader Service Card

PREVIEW
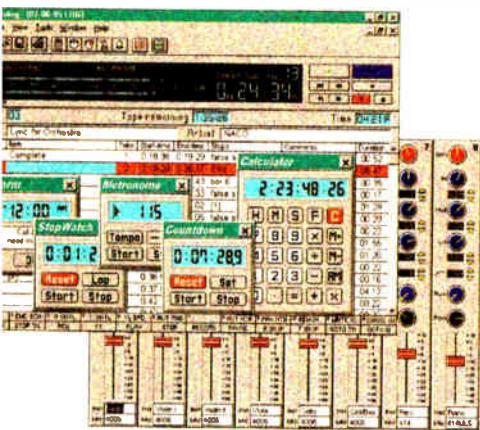
AUTOMAXX AUTOLOG SOFTWARE

AUTOLOG from AutoMaxX (Burlington, Ontario) is a Windows-based software program for controlling DAT recorders and logging all session data. AUTOLOG prompts the operator to enter or confirm reel, index and take numbers, IDs, start and end times; and records relevant console settings. The point-and-click interface includes desktop session tools (stopwatches, metronome, alarm), and necessary cables to connect a PC and Panasonic SV-3900 and Sony PCM7030/50 DAT recorders are supplied.
Circle 238 on Reader Service Card

ATI 8MX2 PREAMP/MIXER

ATI's (Columbia, MD) 8MX2 8-input stereo mixer allows inputs to be assigned to the stereo bus selectively, while at the same time providing limiter-protected direct outs for 8-track MDMs. The single-rackspace unit has 44-position detented controls for mic gain and limiter threshold, mix level and pan control pots and 48V phantom power and ground lift switches on each input channel. Two ten-segment LED displays show audio level and gain reduction. The cue system allows monitoring of tape playback during recording, either via phones or rear-panel balanced monitor output, and cues both pre- and post-limiter signals. Multiple 8MX2s may be linked to combine cue and mix buses. Price is $1,699.
Circle 239 on Reader Service Card

HOT OFF THE SHELF

Promusic announces availability of the E-mu Production Music Library from England, a ten-CD collection of orchestral and small-ensemble music in various genres, and four new Digiffects SFX CDs featuring environmental sounds and foreign language voices. A '96 Promusic sampler CD is available free; call 800/322-7879...Sonic Arts has released a dual CD-ROM library of vintage instruments, titled Sounds of the '70s. Designed for the Kurzweil K2000/2500 running software version 3.0 or higher, the disks contain samples for such classic instruments as clavinet, Farfisa organ, B-3, and Rhodes keyboards, plus drums, percussion, bass and nylon guitar. Call 313/513-2222 or fax 313/513-7449...The Music Bakery has added five new titles to its 25-CD library of buy-out production music. All titles are supplied with AirWorks Media's TuneBuilder self-editing music software and a music search feature for quick cut selection. Call 800/229-0313 for a free demo CD...BASF offers custom-manufactured calibration tapes and films for a range of professional audio applications; delivery is approximately six weeks. BASF's catalog of more than 100 calibration products includes tapes for IEC I and IEC II standards, PER 528 for broadcast and TV, and MP 6 PE for magnetic film recorders. Call 617/271-4197...FWB is shipping its new 2.6GB magneto-optical (MO) drive, the HammerDisk2600 for Windows-based PCs. The high-performance, 5.25-inch half-height drive adheres to the 4x MO capacity standards, is backward-compatible with 1.3GB and 650MB cartridges and is capable of sustained transfer rates of 4MB/sec. Call 415/325-4FWB...Belden Wire & Cable has a new line of flexible low-noise multi-pair audio cables. The Brilliance AudioFLEX™ snake cables, available in 2, 4, 6, 8, 16, 24 or 32 pairs, feature Belden's exclusive French Braid Double Shield, a double-spiral bare copper shield tied together by one braided strand, which reportedly produces lower microphonic or triboelectric noise than conventional designs. Call 800/BELDEN-4...Aphex offers a technical white paper on Tubessence, the technology at the heart of the Aphex Model 107 mic preamp and Aphex Model 661 Tube Expressor. For your free copy, call 818/767-2929...Ricoh Corporation's Disc Media & Systems has introduced its third-generation CD recorder/player at $995. The RO-1420C writes at single and double speeds, can read at 1x, 2x and 4x speeds and is available with 512Kb, 2Mb and 4Mb data buffer sizes. The RO-1420C uses the SCSI-2 interface, features a dust-resistant caddy-loading mechanism and is Windows '95 and Windows NT plug-and-play compatible. Call 201/882-2075...The Sterling Preamp for Leslie 122 and 122A speaker cabinets from C.A.E. Sound simplifies studio interfacing of any ¼-inch mono signal to a Leslie rotating speaker. The unit includes tube audio circuitry and is available in a wood cabinet ($1,195) or as a $950 rackmount unit. A footswitch controls rotation speed via a standard 6-pin Leslie connector. C.A.E. also supplies footswitches, tubes and replacement parts for Leslie speakers. ■

FAIRLIGHT F.A.M.E.
AUDIO MIXER/EDITOR

P rogress is often defined when the inevitable becomes the tangible. In the case of the Fairlight MFX3 Digital Audio Editor, as I related in an earlier "Field Test" (10/95 *Mix*), the system is without equal as a digital replacement for a conventional analog 24-track; my only reservation was that it lacked internal mixing and related functions. As fate would have it, Fairlight was already working on a then-secret project to develop an all-digital workstation—a combination random-access editor/mixer/recorder—that would address all such concerns.

About a year ago, during the NAB convention in Las Vegas, Fairlight software engineers and marketing staff came across a prototype version of Amek's DSP Mixer (since renamed the Digital Audio Mixing Console). It was, as they say, a marriage made in silicon; Amek agreed to supply the assignable user interface, crosspoint matrix and related subsystems on an OEM basis to Fairlight, which in turn would develop a custom protocol to allow the control surface to communicate directly with and operate the MFX3 recorder/editor.

The MFX3 already boasts several multifunction Digital Channel Cards that handle level adjustment and EQ for off-disk playback; all it needed was an additional controller board, transcoding of the commands coming from the mixer, and a means of sending information back to the user interface to display system status. (The topology is actually more elaborate than that, but at least you get the basic idea.)

The bottom line is simple: Fairlight has developed a fully integrated workstation, named F.A.M.E. (standing for, just in case you haven't guessed, Fairlight Audio Mixer Editor), that functions as a complete system. And, as I discov-

ered, the MFX3 hasn't just been bolted on to an external digital mixer; all routing, editing, EQ, dynamics and level adjustments are made within the main Fairlight DSP Tower, which also houses the record/replay hard drives. The system will also directly control external MIDI-based effects units. All in all, it's a remarkable achievement, and one that will extend the already powerful MFX3 digital multitrack into a powerful, full-function workstation.
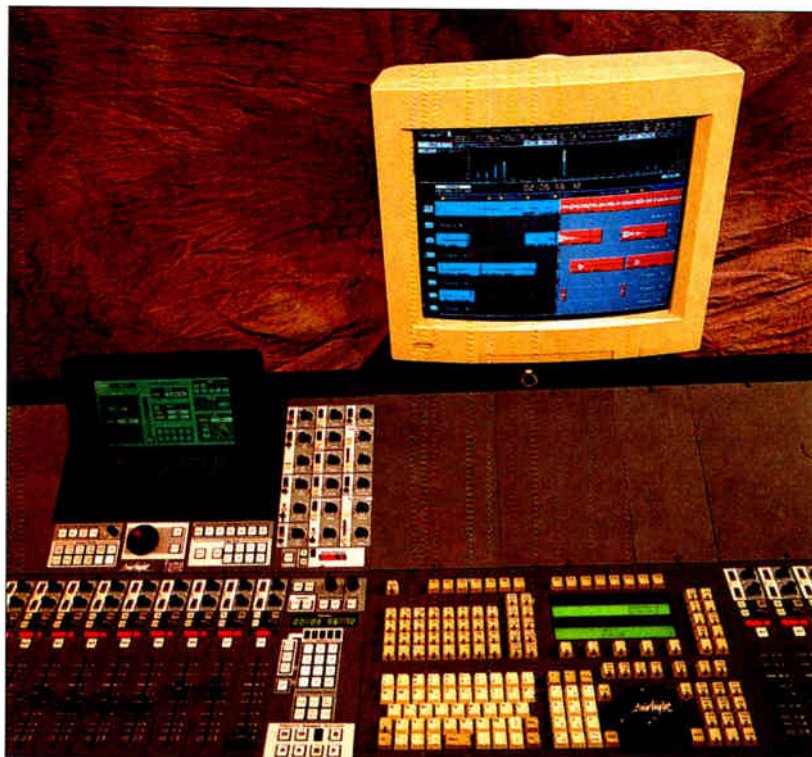
SYSTEM BASICS

F.A.M.E. consists of a 6U MFX mainframe that holds the master CPU, mixing and DSP boards, timing references, timecode and I/O cards, plus master hard drive and choice of removable MO and/or Exabyte backups. The mainframe's rear panel houses the various analog and digital I/Os, plus MIDI, timecode, video sync and other ports. Digital interface is via 37-pin

BY MEL LAMBERT

D-Sub connectors that handle AES/EBU, S/PDIF or Yamaha Y2 format signals. Analog inputs use Crystal 18-bit A-to-D converters. External audio/video transport control is via 9-pin ports to ATR/VTRs, as well as the normal gaggle of timecode boxes, including TimeLine MicroLynx, Motion Worker, Adams-Smith and others.

The mainframe connects to F.A.M.E. via a conventional external 75MHz Pentium PC that handles automation data and other housekeeping chores; a high-speed 10MHz bidirectional serial link carries proprietary protocol commands between the three subunits. Also included in the system is a 16x16 crosspoint assignable switcher, which provides selection of monitor sources and other switching functions. (It basically provides routing between hardware ports and system sources, plus redesignation of system outputs as monitor sources.)

The F.A.M.E. user interface comprises a bank of assignable

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Don Smith
SM 911
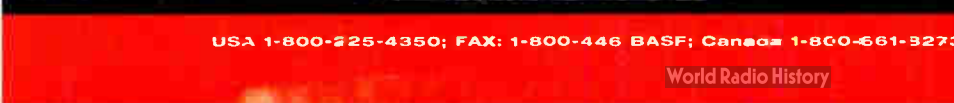
Skip Saylor
SM 900

Joe Chiccarelli
SM 900, SM 468

John Jennings
SM 900, SM 468

Richard Dodd
SM 900, SM 468

"I had to look to see if the band was in the control room or playing live, because this stuff has so much dimension to it."   -Don Smith

"The music sounded better coming off the tape than it did going on to it."   -Skip Saylor

"I've tried everything else. Once."-John Jennings

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World Radio History

moving-fader elements, master controls and a color screen. Faders are available in buckets of eight; currently, a maximum of three buckets can be added for a total of 24 servo-controlled faders, although this number may be extended in the near future. The Master Section houses a touch-sensitive, electro-luminescent screen that displays a variety of system modes and extracts commands from the user. A centrally located wheel and shaft encoder is activated whenever you touch an onscreen icon for a knob or rotary control, such as a level-trim, for example. (A mouse is also available for more digit-intensive operations.) Also housed here are a bank of assignable rotary controls used to set up EQ, dynamics and aux sends (more on these later); transport controls for video and audio decks; plus dedicated system-mode keys, talkback, communications and related functions.

Finally, the mixer control surface contains the MFX console, a unit I described in detail in my previous review. (In essence, it provides a small built-in LCD screen of current timecode and command choices, as well as transport keys, edit keys, scrub/shuttle wheel, numeric keypad, alphanumeric keyboard for naming projects, cues and other data, plus track and bus keys for the disk tracks.) The unit built into F.A.M.E. is slightly smaller in dimension than the current MFX3 version, with a modified key layout, but it is functionally identical. A companion 17- or 20-inch color monitor provides simultaneous waveform display of all 24 tracks, complete with clip names.

F.A.M.E. prices range from $145,000 for a compact eight-fader system, on up to $165,000 for a fully loaded 24-fader workstation.

System options include a hardware meter bridge that houses eight assignable meters (the main touch screen also can be set up to display multiple levels, but there may be occasions when dedicated metering is required); motorized and nonmotorized joysticks with 5-channel routing; plus additional EQ/dynamics/aux control banks, to enable simultaneous control of multiple channels (for users who elect to have a combination of dedicated and assignable controls on the surface). Also, more 16x16 crosspoint assignable switchers can be added to F.A.M.E.—up to 17—thereby extending the I/O routing flexibility. (On a more esoteric front, F.A.M.E. can also be supplied with multiple channels of Rupert Neve-designed mic preamps with remote gain control—a useful option for Foley and ADR stages, where input quality is a necessity.)

The MFX console is fully integrated into the Assignable Mixer section, meaning that track titles laid into the editor appear on the corresponding scribble strips; in this way, the entire system can be run either from the MFX console during editor-intensive segments of a project—and while laying in cues in sync and/or tagging items from the built-in library onto the available track—or the Assignable Mixer while preparing the final stereo or multichannel soundtrack. Transport controls, for example, operate in tandem. Also, projects are loaded into both environments simultaneously, with file backup of all data relevant to a session to a single data file.

RECORD AND MIX

Rather than examining the F.A.M.E. control surface as a conventional all-digital mixer, it is more useful to envision the device as a necessary companion to the built-in 24-track recorder/editor. In Record mode, sound sources can be assigned to a bus or patched directly to an MFX recording track. All normal audio monitoring occurs through track returns, which are outputs (source/replay) from the disk recorder. In Mix mode, all track returns and live inputs are automatically assigned to a number of mix buses.

Each of the mixer channels features a 4-band parametric EQ section. All bands offer up to 18 dB of boost or 99 dB of cut (or highpass/lowpass shelving) from 20 to 20k Hz. (Recall that the MFX Editor uses clip-based EQ; controls on the Mixer can be used to modify EQ in Record and Playback mode. During recording of audio cues into the system and to hard disk, the EQ functions like a normal mixer.) Also available on a per-channel basis is a dynamics section, with expander/gate and compressor/limiter elements, controlled from the assignable bank of rotary controls and switches. (Fairlight is also planning to develop a clip-based version of the dynamics section, so that signal processing applied to a target cue will be retained even if it is copied and/or moved within a project, just as EQ data currently tags along for the journey.)

Up to 32 sets of EQ and dynamics data can be saved in a dedicated library and recalled to the surface; A/B comparisons of EQ settings are also possible using Old and New keys. In this way, favorite voice-over equalization curves, for example, can be recalled between sessions for different talent. Finally, a set of aux controls enables the pre/post-fader signal for a selected channel to be routed to the selected aux bus(es).

To call up the assignable EQ, dynamics and aux sections, you simply hit the corresponding INT ("interrogate") button above the channel fader, select Solo or touch a fader. A ring of LEDs mounted around the skirt of each control knob displays the recalled system data for a particular gain element. A Signal Flow key on the user interface enables different sections of the mixer to be inserted into the signal path in any order; you simply choose what you need using a simple flow chart.

In its basic configuration, F.A.M.E. will handle a total of 36 input sources—normally 24 off-disk replay tracks, plus 12 analog/digital inputs or effects returns—routing to 12 multitrack buses. The dozen output buses can be set up from a user screen as stereo L-R (leaving a total of ten mono/stereo aux buses), 4-bus LCRS, 5-bus LCRSS, 5.1-bus LCRSS-sub and 8-bus SDDS-format—the latter leaves just four aux buses. (At press time, Fairlight was considering extending F.A.M.E.'s basic 36/12 mixing format; more details when they become available.)

Under software control, the input sources can be mapped to any channel fader location; an alphanumeric label can be used as an electronic wax pencil to identify the input source or master control. Up to 16 fader mappings can then be set up and recalled by the simple press of a dedicated key. This feature is particularly useful for laying out a complex mix with more disk and live sources than can be placed on the control surface at one time—you simply bank-switch through the stored setups to bring the control you need to a fader in front of you—or to flip between submasters and individual source controls.

The mixing screen shows status at a glance.

It's a system that is very easy to master, and it's a snap to set up and use under pressure.

The pair of pan controls above each channel fader are reloaded with the appropriate panning laws according to the output designations selected for each signal source. In this way, a post-fader sound can be set to any of the available output ports. In addition, inputs can be selected as mono/stereo sources, in which case the control becomes balance and divergence controls.

If separate monitor buses are required—beyond hard-assigning a bus source to a loudspeaker output—these are taken from the complement of 12 buses available across the system. More complicated source destination routing is handled via F.A.M.E.'s built-in 16x16 Remote Program Switcher, which enables analog or digital signals (AES/EBU format) to be assigned as crosspoints, the settings of which can be memorized and recalled as necessary.

Currently, all level, pan and mute information—plus clip-based EQ—is automated to timecode; input EQ, dynamics and other functions are stored and recalled as conventional snapshots. (In the near future, Fairlight plans to offer an upgrade that will enable current snapshot data to be linked to timecode.) A total of ten freely assignable groups are available and can be set up simply by touching the selected fader. Unfortunately, the individual servo-controlled faders do not follow the moves being controlled from the master fader (although levels are tracking the combination of channel and master fader settings).

F.A.M.E.'s level/mute/pan automation is based on Amek's Supertrue system, which provides a variety of Read/Write/Update modes, with numerous take-over and release-to-previous-data modes. But anybody familiar with one of the more elegant moving-fader systems would be up to speed within minutes of using the system.

It is a minor restriction that no more than 12 live sources can be used simultaneously, since in reality, if we are building elements to hard drive for subsequent remix, sources will be inloaded in groups—dialog, music, effects, Foley, for example—rather than simultaneously. (Alternatively, up to 24 simultaneous sources can be loaded directly to a track without passing through a group bus.) The output restrictions pose more of a problem, primarily because you need to think carefully about how the sources will be blended together, and how many aux sends you might need. Stir in the simultaneous monitoring of various mix stems and the situation can become a shade vexed!

Fortunately, a Surround Multiplexer option allows eight analog, 4-by-mono mixers with mutes and ganged masters control to be linked to the system. Now, a quartet of 8-channel surround mixes can be generated, and their outputs set up as composite surround sums of up to four sources each. Also provided in this $3,850 Multiple Stem Mixer option are software-controllable reassignment of sources, special mono sums, insert send return for Dolby L-R encode/decode systems, and multiple metering points.

Also available via the touch-sensitive master screen is control of external MIDI-based effects units. A library of settings for popular models from Lexicon, Yamaha, Roland, TC Electronic and other manufacturers can be accessed via the touchscreen's VFX Page. Having set up the corresponding MIDI Channel routing, you can now control system settings from F.A.M.E. and store favorite patches and setups along with other automation data. It's a very powerful, easy-to-use function, and one that I am surprised other workstation manu-

facturers do not emulate.

THE BOTTOM LINE

Although the amount of time I spent on F.A.M.E. was somewhat limited, it is remarkable how soon you adjust to this style of working. Having called up a screen page that maps physical input ports to the 36 available system channels, and then developed a user-interface map to place physical faders carrying selected sources in front of you in a sensible layout, you are then free to design a signal flow that suits your specific requirements. Recalling that F.A.M.E. was designed as an adjunct to the MFX3 digital 24-track editor/recorder, what the mixer section brings to the party is dramatically simplified I/O assignments and flexible EQ, dynamics and system monitoring. The user interface is one of the most intuitive I have come across in recent years, and would not intimidate even the most neophyte operator.

As will be appreciated, the built-in recorder and segment-based editor is well-respected throughout the audio-post industry for its speed and user-friendliness. Combined with an elegant front end and monitoring section, the MFX console hardware controller bristles with well-thought-out, easy-to-follow functions.

As I stated in my previous review, it's no idle boast to say that an average user would be up to speed within just a couple of minutes' experience of the MFX3 controller. User keys are easy to find and allow a user to confirm actions via the LCD screen, built-in keycap LEDs, or the dedicated color VDU.

My only reservations are pretty minor. The total number of system inputs and outputs might be insufficient for more complex sessions involving multiple stems and monitoring return, although it is possible to use the Surround Multiplexer to reduce some of the confusion. Also, the current grouping setup is rather odd, but may have been sorted out by the time this review appears. All in all, F.A.M.E. is a dramatic achievement—a combination of powerful functionality that extends the audio creativity of MFX3 into a full-feature workstation.

Fairlight USA, 3855 Hughes Ave., Culver City, CA 90232; 800/4-FAIRLIGHT or 310/287-1400; fax: 310/287-0200. ∎

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

SOUNDTRACS TOPAZ PROJECT 8
ANALOG 8-BUS CONSOLE

The Soundtracs Topaz Project 8 replaces the original Topaz mixer, but the changes between the two consoles are largely cosmetic. The body of the Project 8 is now a dark gray Nextel finish. (Nextel resembles a "fuzzy" paint look.) Additionally, the garish pastel knobs of the original Topaz have been replaced with dark knobs for a more professional look, and bushings have been added to the knob shafts, providing a solid feel. Other than these and a few other minor alterations, there are no major feature or performance changes between the discontinued Topaz and the new Topaz Project 8.

The Project 8 is an analog 8-bus mixer designed for multitrack recording that comes in 24- and 32-channel (48- and 64-input) versions. Because it's an in-line design, the Project 8 has two inputs (Channel and Monitor) for each channel strip. Generally, the Channel is used for recording live tracks during tracking and overdubbing and for tape tracks during mixdown. The Monitor can be used to monitor previously recorded tape tracks (or virtual MIDI/workstation tracks) during tracking/overdubbing and for sending any other line input source to the 2-track bus during mixdown.

CHANNEL INPUTS

Starting from the top of the input channel, the Project 8 has a scribble strip and switches for phase reverse, phantom power, flip and bus (more on flip and bus later). The gain pot has a 10dB to 60dB range for mic and a -20dB to 30dB range for line-level signals.

The channel EQ section has a high-shelving band at 12 kHz, low-shelving at 80 Hz, and two swept-mid EQs. MF1 EQ is sweepable from 350 to 8k Hz, and the MF2 EQ is sweepable from 50 to 1k Hz. All EQ has a ±15dB range and a center detent. EQ bypass switches
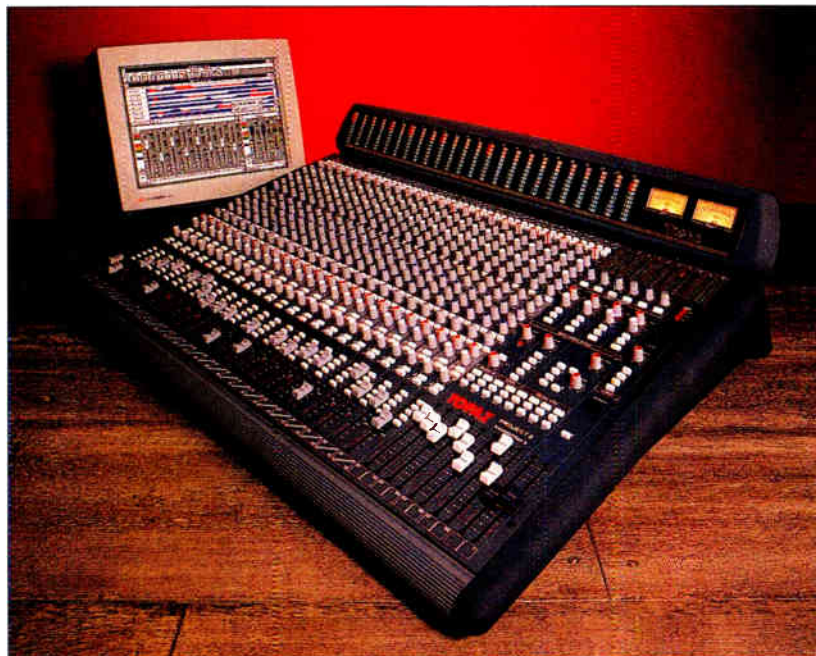
Topaz Project 8 console, shown here with optional meter bridge and automation

are provided. A dedicated 2-band EQ devoted to the Monitor input consists of high-/low-shelving EQs (80 and 12k Hz), both with a ±15 dB range.

The aux section uses a four-of-six arrangement, meaning that there are six aux send outputs, but only four can be used on a channel at a time. Aux 1 is a pre-fader channel send, and Aux 2 is a pre-fader monitor send; unfortunately, these cannot be switched for post-fader use. Auxes 3 and 4 are post-fader sends and can be switched for use with either the Channel or Monitor input. Switches allow routing Aux 3 to the Aux 5 output and Aux 4 to the Aux 6 output.

Each channel's monitor section also has a level pot, center detented panpot for the monitor, as well as illuminated monitor solo and mute switches. Finally, there is a center detented panpot and illuminated solo and mute switches for the Channel input. Beneath that are five channel assignment

BY DOMINICK J. FONTANA

switches, one for the L-R bus and four for assignment to the eight buses in odd/even pairs. Also standard is a 100mm long-throw fader and a peak LED, which illuminates about 5 dB before clipping.

GROUP AND MASTER SECTIONS

The Topaz has four stereo effects returns, each with a level pot and center detented balance pot, buttons for assignment to its local group and the L/R bus, and an illuminated PFL (Pre-Fader Listen or Solo) button. The local group assignment means that FX1 can only be assigned to Groups 1-2; FX2 to Groups 3-4; FX3 to Groups 5-6; and FX4 to Groups 7-8.

The eight group buses have long-throw faders; above each is an illuminated AFL button and separate Left/Right assign buttons. Pressing both assigns the group output to the L/R mix bus.

The six Aux masters have level pots and illuminated AFL buttons. The master Solo section has a rotary level pot and LED that lights

when any solo button on the board is pressed. There is a master monitor mix section with a rotary level pot and a Merge button. Using the separate Monitor L/R outputs, the monitor mix section can function as a completely independent 24x2 or 32x2 submixer. Pressing the monitor mix Merge button doubles the available number of channel inputs by sending the monitor mix to the main L/R outputs.

The studio monitoring section allows monitoring of the main mix, monitor mix, control room source, Aux 1 and Aux 2. The control room section consists of a rotary level pot and buttons to monitor the main mix, monitor mix, Tape A and Tape B. A mono switch provides a quick check for mono compatability and phase problems, and a speaker A/B switch lets you to switch between two sets of control room monitors. The headphone jack carries the same signal as the control room.

There is a talkback section but no built-in talkback mic. You have to supply your own gooseneck and mic. The

PROJECT 8 AUTOMATION

For those who need additional horsepower, an optional automation package is available for the Topaz Project 8. Combined with your Windows computer, this option adds $2,200 to the retail of a 24-channel board, or $2,500 to a 32-channel mixer.

The Project 8 Automation was a snap to install because the VCAs were already installed in the review Topaz I received. The VCAs, according to the manual, are the latest trimmable versions from Analog Devices. It took about ten minutes to hook up the hardware and five minutes to install the software. I received V1.01 software for Windows. The Project 8 automation is controlled through the software only and not through the faders and mutes on the mixer. The software has an attractive user interface and was relatively reliable in operation. The manual was a bit sketchy, but it tells you what you need to know to get started. I was up and running in no time.

The automation records and synchronizes mixdown events using MIDI Time Code (MTC), and it supports MIDI Machine Control (MMC). The frame rates supported are 24, 25, 30 ndf, and 30 df. The automation allows control of channel fader levels and channel mute on/off. You cannot control monitor, Group or L/R fader levels or monitor mutes.

There are three main windows: Main Fader, Group, and Mix File. The Main Fader window can be configured for 24 or 32 channels, and it displays a replica of the mixer faders and mutes. Fader and mute levels are controlled by pointing and clicking and dragging these controls. However, the actual hardware mixer's settings do not move. You can put either the faders, mutes or both in

Record mode, which records all your fader and mute moves; in Play mode, which replays those moves; or in Trim mode (faders only), which allows you to record events on-the-fly, while the mix is playing back. An Isolate mode allows you to mix "live," without recording your mix moves. In addition, a Safe switch prevents you from accidentally changing any settings, and there are stereo channel links for locking any two adjoining channels into a stereo pair. Any changes made to one channel affect the linked channel. Master channel controls put all channels, except those in Safe mode, into Play, Record, Trim, Isolate or Safe modes. You can also set all channel fader levels to 0 dB (nominal level) or off, and you can change the view of the Main Fader window from small to large.

The Groups window allows you to group any number of channel faders, controlled by a single fader. These virtual software groups bear no relation to the 8 group outputs on the Project 8.

The Project 8 automation supports both real-time mixing and offline editing. That is, you can make changes to your mix after you have recorded it in real time. Snapshot automation is also available, which will reset all faders and mutes to the the positions they were in when you took the snapshot.

Offline editing takes place in the Mix File window. Here you can insert, delete, move, copy, join and nudge events using a timeline. There is also an Undo button and numerous zoom levels. You can also automatically fade the mix out (but not in) and save, load and name individual mixes. There are many other ways to edit your mix events, but space prohibits me from mentioning them all.

There is also a Notes window for writing comments about the mix and a very nice Tracksheet. You can select numerous options and save them. There are nine menus consisting of File, Edit, Tools, Snapshots, View, Console, Options, Window and Help, as well as a Toolbar. There is a timecode display window with transport controls, for use with MMC, that is always visible. It can be moved, but not closed or placed behind other windows. I found that this window tended to get in the way.

Using the automation was generally a pleasure. The software has extensive online help. Everything worked as it should, and the system only crashed once. The software was intuitive and easy to use. Although I've been automating mixes with MIDI sequencers for years, this was my first time using software to control a hardware mixer, and the results were quite satisfying. The Project 8 uses dynamic frame-accurate fader and ¼-frame-accurate mute automation. I had no trouble with zipper noise, but there was a small problem with the end of the faders' taper: When I manually faded out a track, the sound would be totally faded out when the software fader was not fully down. Other than that problem, the automation worked remarkably well.

There is no hardware fader pack to control the automation so, to the best of my knowledge, all mix moves have to be made through software or through some kind of third-party fader pack. But for software automation, it did a fine job and I recommend it.
—DJF

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FIELD TEST

section consists of an XLR mic jack, rotary level control and buttons for assignment to the studio, groups, Aux 1 and Aux 2.

The L/R master outputs are controlled by two 100mm long-throw faders. Three LEDs indicate the status of the power supply rails. Levels for the tape inputs and outputs can be internally switched between +4 and -10. There are ten LED meters for the eight groups and the L/R bus. The L/R meters also show solo levels. Each meter has ten segments and is calibrated from -21 dB to +6 dB, in 3dB increments.

CONNECTIONS

All of the jacks, except for headphone and talkback, are located on the back of the mixer. The mic inputs are XLRs; all others are ¼-inch phone jacks. Inserts are TRS, requiring Y-cables for sends and returns.

Each channel has five jacks: mic, line, insert, monitor/tape in and tape out. There are separate mic and line input jacks, but as there is no mic/line switching, only one source should be plugged into these jacks for each channel. Whatever is plugged into the mic or line jacks is by default routed to the channel input. The insert jack (post-EQ) allows you to process each channel individually. The monitor/tape in jack is routed by default to the monitor input section on the channel strip. You will normally connect your tape returns here, but you can connect any other line-level source. Pressing the Flip button reverses the channel and monitor assignments. Whatever is connected to the mic or line inputs will now be routed to the monitor section, and whatever is plugged into the monitor/tape inputs will now be routed to the channel section.

Project 8 employs an elegant floating-bus scheme, which allows you to record using direct outputs or the group bus, without repatching. The tape out jacks connect to your tape inputs and serve double duty as both direct outs and group bus outs. These work in conjunction with the bus switches on the channel strip. When the bus switch for a channel is not depressed, that channel's tape out jack functions as a direct out.

In addition to the floating-bus scheme, Project 8 has eight dedicated Group Out jacks. The rest of the back panel contains eight TRS insert jacks for the groups, Aux 1-6 output jacks, four TRS stereo effects return jacks, control

room A and B L/R jacks, studio L/R jacks, main L/R jacks, main L/R TRS inserts, monitor mix L/R jacks, 2-track A and 2-track B L/R input jacks, and connections for the outboard power supply, optional meter bridge and automation. Although non-rackmountable, the power supply's convection cooling does not require a fan and provides silent operation.

OPTIONS

The optional meter bridge contains the same type of LED metering that is used on the Topaz and has one meter for each channel, as well as two standard VU meters for the L/R Mix. The meter bridge plugs into the connectors provided for it on the back of the Project 8. The 24-channel meter bridge is $849; a 32-channel version is $949.

The optional VCA fader/mute automation consists of a 1U rackmount unit, one ribbon cable for each 8 channels of automation, automation software for Windows, and a manual. If you buy the Project 8 with the automation, the VCAs will already be installed in the

The Project 8 sounds fabulous. From the moment I first heard it, I was impressed by its sound quality.

Project 8 for you. If you buy the automation afterwards, the VCAs will have to be installed, which involves taking apart the Project 8. (For further information about the Project 8 automation, please see the sidebar, "Project 8 Automation.")

OPINIONS

The Project 8 has a nice feature set. Besides individual phantom power on each channel, it has phase-reverse switching, which is not commonly found on mixers in this price range. Project 8 also offers dedicated 2-band

SHURE BETA 57A AND 58A

MICROPHONES

Few audio products are more universally accepted than Shure dynamic microphones. In one form or another, the ubiquitous SM58 and its SM57 cousin have been with us since the cave-painting days when sound reinforcement involved little more than Altec A-7 Voice-of-the-Theatres and a Crown DC300 (or even a Vocalmaster). Who doesn't sentimentally recall the day they owned their first 58?

The advent of high-energy magnets begat the Beta 58 seven years ago. Since then, Shure's continuing R&D efforts to retain leadership in the field of sound reinforcement microphones have led to the next generation, the Beta 58A and its new siblings. While the Beta 87 remains unchanged, there are two new models, plus refinements to the old standards.

This is not your father's 58, or even your big brother's Beta. I would have called them the Delta 58 and 57, emphasizing the changes, but sensibilities prevailed in what I imagine was a recurring topic around the marketing water cooler at Shure Brothers. The new Beta 57A and 58A microphones, shown for the first time at the Winter NAMM show, are now shipping. By the time you read this, inventories of the previous Betas may be depleted as they are no longer being manufactured. While both earlier Betas listed for $266, the new Beta 57A lists for $220 and the Beta 58A retains the same price and profile. Much about these mics has changed.

At first glance the new Beta 58A is almost identical to the old one, but close examination reveals several distinctions. The "Beta 58" logo is no longer angled and is now written in blue. Also, the new Betas have a one-piece body. Both the SM58 and the old Betas employed the now-familiar two-piece design where the capsule screwed onto

the bottom half of the body. The new capsule and its suspension are now held within the one-piece body by an expansion ring. The magnet has been rede-signed from the previous toroid to a smaller, pill-shaped design, which focuses the magnetic field more tightly in the area of the voice coil, and the grille slips off more easily when unscrewed, due to this focused flux density.

Another way to note the difference between the new and older designs is simply to listen. The polar response of the Beta Series mics is supercardioid rather than cardioid, offering better rejection at the sides of the capsule in exchange for a lobe of response 180° off-axis at the Beta's rear. This means that while an SM58 works well with a single wedge directly behind it, the Beta 58's tighter pickup pattern and rear lobe make it work better with two floor monitors or, when used with a single wedge, parallel to the floor, offering its least sensitive area, 125° off-axis, toward it. Sound engineers familiar with the old Beta 58 know that, although it had more output than the SM58, its on-axis frequency responses are quite similar. The old Beta was down 1 to 2 dB at

BY MARK FRINK

low mids (from 250 to 800 Hz) compared to the SM58, and the old Beta had 2 dB less than the SM58 right at 8 kHz, which was traded for a couple dB more at 6 kHz and at 10 kHz, giving it more crispness. Essentially, the old Beta 58 is sonically more like the SM58 than is the new Beta 58A.

Using the SIM's FFT capabilities and a John Hardy mic preamp to compare the new and old Beta 58 against a B&K 4007 SIM reference mic, a graphic display showing their response was obtained (see illustration). The top graph is the new Beta. The bottom graph
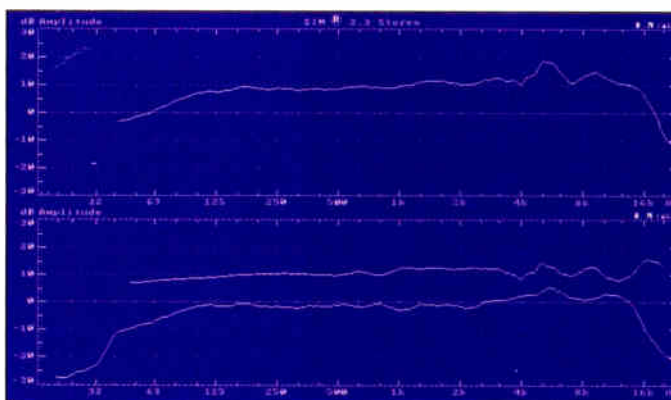
The frequency response curves of the new (top) and old Beta 58s. The middle line is the difference curve, offset 10 dB.

shows the old Beta; above that is a "difference" curve, offset 10 dB, showing the changes in going from the old to the new Beta 58. When the difference curve exceeds the 10dB line, it indicates increased output over the old Beta 58. While many response factors are beyond the scope of the methods employed, this should give readers a rough visual indication. These graphs were compared to LMS sweeps and actual use and listening tests with club and festival P.A.s, wedges and earphone monitors.

Soundwise, the new Beta 58A represents both a refinement and a departure. Overall, the 58A has

more highs and less lows, compared to the old Beta, at about the same overall sensitivity. Turning over at 1 kHz, the 58A has about 2 dB more response at higher frequencies, except at 4 k and 12 kHz. Up at 16 kHz there's as much as 6 dB more, giving the mic an open, "airy" response. Below 1 k, there's a bit more 600 Hz, but the response below 100 Hz is lower than the old Beta 58, giving the mic a thinner sound, while making the 12dB/octave highpass filters on most consoles more effective.

The new Betas' gain-before-feedback is generally improved, but this depends on the particular monitors and their orientation. Off-axis rejection is much better from 1 k to 3 k, but a bit worse at 700 Hz and at 6 kHz. I recommend carefully considering mixing old and new Betas in the same system, particularly as vocal mics, because of the differences in frequency response, both on- and off-axis. Shure would be glad to have you replace entire inventories at once, buying a half-dozen at a time, and moving the old ones down to the 'B' system or selling them to a local club or summer venue, and this would be the smartest strategy.

Noise handling can be evaluated in different ways: the sound that a ring makes when it hits the mic's body, the vibrations caused by fingers rubbing against the mic, or the transmission of sound through the mic stand and clip. Each of these transmissions has distinct frequency response. Noise handling in the new Betas is significantly improved in the midrange. The familiar "doink" found in earlier models is replaced by a low-frequency rumble that can be heard as a by-product of the new suspension. A highpass filter will eliminate this artifact and the stand-mounted use of these mics on hollow stages or with subwoofers in close proximity will require it.

The new Beta mics have a smoother impedance curve, which will provide stability in their frequency response when used in situations with extra snake splits such as multitrack live recordings or remotes, and multiple monitor desks. The impedance swing is about half of that of the previous Betas.

The new Beta 57A is almost identical to the 58A, but with a different pop filter. The old ribbed-steel grille has been replaced with a trim, cylindrical mesh grille with the same profile, but now identical in styling to the Beta 58 grille. In these modern times where on-camera aesthetics are increasingly important, the Beta 57A will be a hit with

camera-conscious artists who want to maximize the sight-lines to their lips. Other than the differences between the grilles, the two mics are similar enough to be interchangeable, and while either one would serve equally well as a vocal mic, the lower price for the 57A and its trim styling combine to make it an ideal all-purpose microphone for not much more than the cost of an SM58. Sonically, it has slightly more lows when used for vocals, due to the increased proximity effect available from the geometry of the grille's closer fit to the capsule. There are, of course, purists who will always prefer the profile of a spherical grille.

The Beta 56 ($240 list) is simply a Beta 57A with a 180° pivoting angle-joint with the XLR connection next to the threaded mic-stand mount, similar in concept to the old SM56. Beta 56 users will never have to worry about broken mic clips. The angled design reduces the visual profile when placed in front of drummers and percussionists, and makes it stick out less in front of guitar amps. For LP Claw enthusiasts, Shure provides a 3-inch accessory adapter called the A-26X. This extends the mic far enough above the Claw's "handle" to be plugged in, allowing these rugged mics to be left attached to the armature and tossed into the work box drawer, but an Atlas LO-2B "quick-release" will also serve.

Last, but not least of the series, the Beta 52 kick drum mic ($310 list) has a fashionable look, and its pre-contoured frequency response has most kick drums sounding good before any EQ is applied. Using the same articulating stand-mount as the Beta 56, there's no clip to lose or break. An onboard equalizer gives the new Beta dynamic elements a boost below 100 Hz. Inside there's a small PC card with a cap and a coil, giving it some phase shift where it boosts the lows, but most engineers use so much EQ on the kick that discussions of phase shift are moot. This mic works particularly well in two- or three-way systems, but there might actually be too much low end when used in systems with "true" subwoofers. I found its peak at 4 k to be a little high for me, preferring to get my "click" at 2 k, but this mic will outperform what many people are using now. Its pleasing sound will turn heads and save several minutes at the beginning of every sound check.

Shure Brothers; 222 Hartrey Ave., Evanston, IL 60202. Phone 708/866-2200; fax 708/866-2279. ∎

EARTHWORKS OM1 AND TC30K

STUDIO MICROPHONES

There are certain inalienable laws by which all audio devices exist. Great-sounding gear must be huge, heavy and cumbersome. And *very* expensive. Yet the OM1 and TC30K microphones from Earthworks seem to fly in the face of everything we were ever taught: Here are two mics that are compact, affordable and sound terrific. This seems like mixing matter and antimatter. How is this possible? And just who is Earthworks, anyway?

Let's examine these questions one at a time. Earthworks was formed by David Blackmer, founder of dbx and inventor of the VCA system now sold on an OEM basis by THAT Corp. He was instrumental in the design of some early API products and is credited as the inventor of conductive plastic faders. Other principals at Earthworks include jazz pianist Danny Solomon and Blackmer's sons Eric, director of sales and marketing, and Michael, a studio designer/acoustician and studio maintenance engineer.

The $399 OM1 and $499 TC30K

share certain similarities: The two are small-diaphragm condenser mics with identical length (nine inches), weight (eight ounces) and response pattern (omnidirectional). Both models have a wide frequency response that extends from 9 Hz to beyond 30 kHz. The OM1 has a slightly rising response, starting around 4 kHz and resulting in a +2dB peak at 22 kHz; this peak is less pronounced in the TC30K, where the rise begins about 9 kHz and peaks about 1 dB at 22 kHz. This relatively flat response is not typical in studio mics and has more in common with certain European instrumentation mics that are priced in the $1,500-and-up range.

I was anxious to check these mics out in session, but a few caveats are in order. Both mics require at least a minute of warm-up time before use, unless you enjoy listening to spurious pops and clicks at high SPLs—keep your monitoring system turned down during this warm-up period. The

BY GEORGE PETERSEN

two units operate on standard 48V phantom power, but the OM1 will not work in a system that uses transformer-coupled preamps. Today, most consoles and preamps are electronically—rather than transformer—balanced, and this will not be a problem for most users. However, if you're an engineer who uses a variety of systems in different studios, the transformer-compatible TC30Ks are the preferred choice.

Earthworks says the mics' ultra-small diaphragms provide excellent impulse and transient response. They aren't kidding. To check this and upper-frequency response, I recorded through a Millennia preamp to a Pioneer 96kHz DAT machine. On percussion (claves, cowbells, snare, kit overheads and triangle), both the OM1 and the TC30K delivered absolutely explosive performance, with stunning realism and tight, punchy attacks. The first word that came to mind was "air." Although the two mics are omnidirectional, they are slightly less directional at higher frequencies, and on some sources—
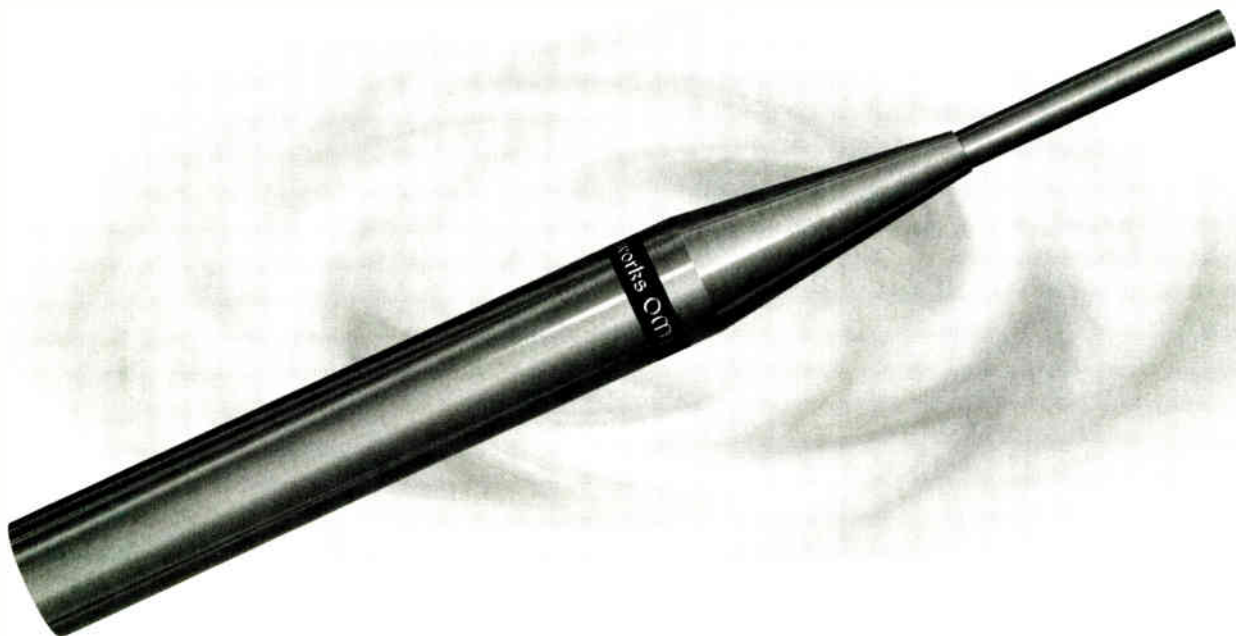
piccolo trumpet and close-up on acoustic 12-string—the mic was somewhat bright. This was remedied by rotating the mic between 45° and 90° off-axis from the source. On a string session (cello and viola), I chose the TC30K for its more natural, flatter response, which still reproduced plenty of rosin.

Compared to high-end studio or instrumentation units, these mics have a noticeable amount of self-noise, rated at 27 dB (A-weighted). According to Earthworks, this was a trade-off: Improved impulse response was exchanged for the increased noise of a small-diaphragm design. There are two ways to look at this. As drum mics on a (sonically) busy rock session, the noise difference won't be noticed, although the increased clarity and transient response would be a major plus. On the other hand, noise could be a problem on a delicate chamber piece with exceedingly quiet passages. But once the SPL of the source increases, the self-noise of the units becomes a moot point.

Further, as the mics are omnidirectional, they are free of the proximity-effect problems caused by close miking. The mics handle more than 150 dB— not unheard of when miking kick drums or snares from a few inches away—so their maximum dynamic range capability (max. SPL minus self-noise) easily exceeds any 16-bit digital system. Over a period of months, I never encountered any sources that could overload the mics. It should be said that the mics are fairly susceptible to breath pops and should be used with screen filters for vocal applications. Speaking of vocals, I wasn't wild about the mics on lead vocals; perhaps I'm just used to a more heavy-handed presence boost with a pronounced proximity effect. However, I liked both mics for background vocals, particularly when seeking that breathy, ethereal sound.

Offering extended frequency range performance with impeccable transient response, the Earthworks OM1 and TC30K are quality studio tools that would be a welcome addition to nearly any mic locker. And as an instrumentation mic for system measurements in the studio, test lab or on the road, the OM1 and TC30K are affordable choices for anyone seeking to move to the next level. Also of note is Earthworks' new TC40K ($900), which is similar but offers a 40kHz (±1dB) bandwidth.

Earthworks Audio Products, 37 Wilton Road, Milford, NH 03055; phone 603/654-MICS; fax 603/654-6107. ∎

POST · SCRIPT

WHY FIVE

By Larry Blake

As many of you have noticed, I have broken almost all of my promises not to write about topics that I felt I had run into the ground; sorry about that. But there is one topic that I wouldn't even pretend to close the lid on: the benefits of five channels behind the screen, as practiced in the original 6-track 70mm format.

I can still remember vividly going to the Cinerama Theater in New Orleans to see *That's Entertainment* and wondering whether the overture was being played by an orchestra in the auditorium. I recall walking out of the Robert E. Lee Theater near my house after seeing *My Fair Lady* and having a friend, Kevin McDermott (who is less technical than your grandmother), ask me why that film sounded so good. While I'll never give any credit to technology over people's abilities, the original 6-track format has always had a three-dimensionality that standard LCR film mixes can't touch.

My last two columns (in the April and June issues) showed why I believe past and present film sound speaker formats, with three main channels, will become a prominent force in the future of music recording. This month the focus shifts back to my usual stomping ground, movie theaters, and yet again I'm pitching for an increase in channels, this time from three main screen channels to five.

The ultimate, "ideal" recording and reproducing system has been classically expressed as an infinite number of microphones connected to a infinite number of speakers. When you get to the real world and have to contend with a proscenium situation that we have with movie theaters, five main channels has proven to be the point of diminishing returns. First, a little background.

Five channels is not a new fad; it was the *first* format to be mated with widescreen stereo films. This first use of five channels behind the screen was for the Cinerama process, which premiered with *This Is Cinerama* on September 30, 1952. The picture was supplied by

three projectors (having been photographed with three cameras) onto a 75-foot-wide, 146-degree-curved screen. Sound was carried in interlock with the projectors on a 7-track 35mm mag dubber. The additional two tracks were used for varying surround channel applications; they weren't just apportioned left-

and right-surround in the current fashion. The difference between this presentation and the then-standard 1.33:1 black-and-white image with Academy mono optical soundtrack was staggering. However, Cinerama, like its present-day counterparts IMAX/OMNIMAX and Showscan, failed to be accepted for feature-length dramatic narrative films. (And rightly so, I think; a standard 2-D, 35/70mm widescreen color image is the point of diminishing returns of the technical needs of filmgoing presentation. The only thing that gets you beyond this point is a great script.)

Although the three-panel Cinerama process would be abandoned in the mid-'60s after having been used for less than ten films, its sound system would live on. Promoter Mike Todd worked on *This Is Cinerama* and saw the compromises inherent in the 20th Century Fox CinemaScope system (introduced in 1953), which tried
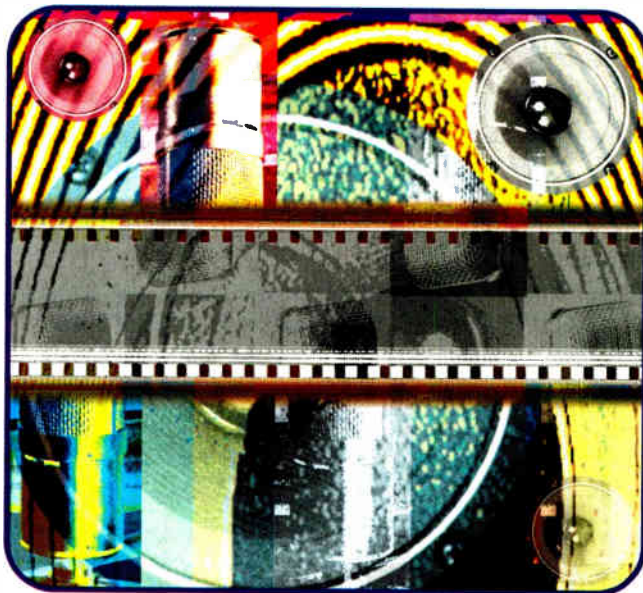
ILLUSTRATION TIM GLEASON

TALKING TO YOURSELF

PRODUCTION SOUND FOR "MULTIPLICITY"

by Tim Moshansky

There are three things that I've always wanted to do—make myself invisible, freeze time and clone myself. With all of the recent developments in DNA research and genetic engineering, it seems that the latter is the most probable in my lifetime.

In the new Columbia Pictures comedy *Multiplicity*. Michael Keaton plays Doug Kinney, who figures that to survive the hectic lifestyle of the '90s, he needs another him. So he clones himself.

Dennis Maitland, production mixer for the movie, describes the dialog recording as a little out of the ordinary. "Let's assume we have four Michaels on the screen," he says. "When we do a take, we have Michael and three stand-in actors who know the dialog. Now we're locked to that take. Then Michael goes and changes his costume and becomes a clone. Then with Pro Tools, we edit out the next stand-in's line. When Michael comes back, we give him an earwig and we feed the first take back to him." Induction coil loops were arranged in various areas of the set to enable the playback of his previous lines. Once they had completed the second take, Keaton would again go and change costumes as they Pro Tools-ed out the second stand-in's line.

"He did a marvelous job throughout them all," Maitland continues. "I mean, I

Michael Keaton driving himself in Multiplicity, a Columbia Pictures release. Right: Peter Brancaccio (with back to camera) takes notes from production sound mixer Dennis Maitland

PHOTO: STEPHEN VAUGHAN

don't know how he did it. When you're watching it, it's like he's talking to himself. He high-fives himself, he chests himself, he walks behind himself, he throws himself a can of beer and catches it—there's a lot of interesting stuff happening. To be honest with you, I would be hard-pressed to think of anyone else who could do it. He just took to it so naturally. Remember, he's hearing in his earwig himself, plus the other extras. You'd think it would be confusing to him. It's a funny movie anyway, but he added to it immensely."

When they got a take that they locked into (when they'd done the four Michael Keaton passes), they did a fifth (clear) pass with no one in the room, so that the matting and the green screen

could be placed on top of the visuals.

Because there were a lot of background sounds from the motion control camera and the laser control, Maitland would notch those objectionable sounds out between passes and do a remix each time they did a pass.

"What I discovered sometimes," recalls Maitland, "was that one character that he was portraying was dramatically dominant over the others, so I would remix it with

that in mind."

While this sounds like a great premise, for the filmmakers it was a huge challenge. Peter Brancaccio was called in as the "digital sound guy" on set, and he recalls the uncertainty of the initial stages of pre-production, when everyone was trying to figure out the best way of approaching such a complicated undertaking.

"I was hired about a month before the shoot, while they were testing all of the computers," Brancaccio

says. "The problems that they were having were mostly to do with the synchronization of all of the various machines, such as the motion control camera, the laser tracking system as well as the visual effects computers that were generating animated blue screens. We ended up using Pro Tools as the master sync clock, generating standard NTSC timecode. We would trigger everybody at 20 seconds, so for the film it was kind of an abnormally long pre-roll for every shot. It was a smart decision in the end, because that way everybody was sure that their machine was locking in."

Brancaccio used a Macintosh Quadra 950 running Pro Tools 3 with TDM modules, making particular use of the DINR noise reduction software. It's one of the first films done with servo-controlled cameras *and* sound. The noise reduction software allowed them to feed samples of sounds such as dolly noises and motion control whirring into the computer, which would then take those sounds out.

The producer's original intention was to simply record 2-track, where the new Michael Keaton was always going to be on the left track and the composite track would be on the right side. But as Maitland got into it, he began treating it like any other master with four people talking.

The master track was recorded onto a Fostex PD-2 DAT machine, as well as a Fostex RD-8 8-track digital recorder, in case they needed to go

into the individual tracks. Maitland also took advantage of the Mackie 1604 mixer and was particularly happy with that machine's direct outs. Pro Tools timecode was striped onto one track of the 8-track; he had used a similar method of recording on *Die Hard With a Vengeance.*

"When you get a scene like in *Die Hard* where you have eight people in an ad-lib scene and fighting, you don't know where anybody's going to go," explains Maitland. "When somebody grabs someone's mic and eight people are talking, if you do it in mono, then eight people have to loop. If you do it in stereo, then four people have to loop. If you do it in 8-track, only one person has to loop."

When viewing the dailies for *Multiplicity* with the director and the producers, Maitland says, they were treating the track as a final master, and he was confident that the majority of time they would use the composite master he created. "When you don't hear anything in dailies, then you know you did okay."

There were a total of five crew in the sound department: Maitland, a boom op and a third man; the Pro Tools operator (Brancaccio) and one person dedicated to the Siemens in-ear monitoring system for Keaton, Lectrosonics wireless microphones were used when needed, and Schoeps for everything else. An Aphex gate was used for keeping noise down.

The Maitland family is legendary in

the sound industry. Dennis Maitland began in the "golden days" of live television on shows with Ed Sullivan and Jackie Gleason. He mixed The Beatles when they invaded the States. Once videotape was introduced in the early '60s Maitland chose to go into film; he has since worked on dozens and dozens of high-profile features.

His daughter, Kim, is a mixer for *Entertainment Tonight* in New York; Dennis Jr. (who recently finished as a mixer for the feature film *Diabolique* with Sharon Stone) resides in Pittsburgh, and his other son, Todd, also in New York, recently worked on *Donny Brass* with Al Pacino. Todd has been nominated twice for an Academy Award, once for *Born on the Fourth of July* and once for *JFK.* Maitland took each of them on as an assistant for two years before sending them off on their own.

After more than four decades in the sound industry, Dennis Maitland has no intention of packing it in any time soon. While he lives in New York, he spends a lot of his time in L.A. and whatever locations sound interesting to him. "I don't intend to retire," he says, "because I have so much work coming in. My wife will look in the *Hollywood Reporter* for a good location, and we'll try for that." ∎

Tim Moshansky, a freelance writer based in Vancouver, Canada, has recently published the second edition of The A to Z Guide to Film Production Terms.

to bring Cinerama's appeal to the masses, albeit with smaller 35mm negatives and 4-track sound. He wanted to retain as much of Cinerama's image quality as possible, eliminating the grief associated with the three-camera system. In a now-famous quote, he said he wanted Cinerama "out of one hole."

The result was the Todd-AO process (the "AO" standing for the American Optical Co., developers of the lenses), which premiered in October 1955 for *Oklahoma!* Photography was on 65mm film, with the print stock 5mm wider outside the sprockets to accommodate the magnetic striping for the 6-track mix— five channels behind the screen and a mono surround. None of this was totally new, of course: Wider-than-35mm film had been tried for decades, magnetic striping on prints was pio-

neered by Fox for CinemaScope, and, of course, Cinerama had started the five-screen-speakers sound system.
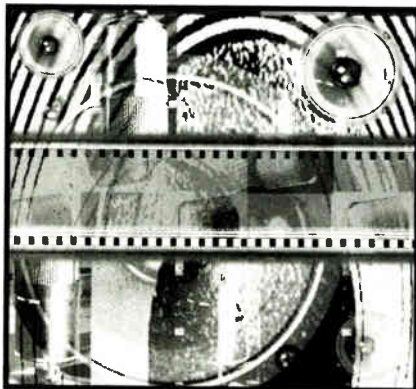
But Todd-AO brought it all together in a neat package, and for the next 15 years, 70mm 6-track was as good as it got. I say "70mm" generically as opposed to Todd-AO because they were

not the only ones to use the format; Panavision made superb 65mm cameras, and 6-track mixing was available in the U.S. at MGM and Fox, in addition to Todd-AO. All three facilities used Westrex consoles and recorders.

When other studios were making 6-track mixes, they either had to mix 4-track in-house and then "spread" the final to a 6-track print master (although the phrase was not in use then), or, preferably, mix the whole film 6-track elsewhere. So, there would be the odd situation of mammoth productions such as *Spartacus* and *My Fair Lady* (produced by Universal and Warner Bros., respectively) being mixed at Todd-AO.

Spreads were accomplished by summing the left and center tracks to create a left-center and summing the right and center to create a right-center. It should be made very clear that this was a com-

promise, and even more to the point, an exception brought on by the scarcity of 6-track recorders and consoles. But if a film was shot in 65mm and produced by Fox or MGM, you can be sure that music recording, premixing and final mixing were done 6-track. (This also holds true for a number of films blown up from 35mm, including *The Sand Pebbles* and *Doctor Zhivago*.)

The difference between real 6-track and a spread was deemed substantial by those who have mixed both ways.

The demise of 65mm photography and 70mm 6-track release can be traced not to any technical improvement but to substantial losses by most major studios in the late '60s. In 1971, almost overnight, the format disappeared (taking stereo mixing with it), save for the odd blow-up for a few roadshow prints.

Thus began The Dark Times for stereo films, until, that is, Dolby Laboratories appeared on the scene in the mid-'70s with a multitude of improvements for stereo film sound. Dolby's arrival was both the good and, as I'll point out in this context, the bad news. Primary among the good was A-Type

POST NOTES

East Side Audio and Video, NYC, has named Neil Karsh chief engineer. Also, engineer Tom Jucarone recorded and mixed the voice, effects and music for the new Snapple spots featuring the finicky child Mikey, of Life cereal fame. Mikey was recorded wild into a Neumann mic, then the voice was manipulated in an NED PostPro...Solid State Logic installs: **Howard Schwartz Recording**, NYC, bought the first Axiom on the East Coast; **First Edition** and **Pomann Sound**, also of New York, each bought an Omni-Mix; **Cliff Hahn Sound**, New York, bought a Scenaria; and **American Production Services** of Seattle purchased a Scenaria. Meanwhile, **Video Post & Transfer** of Dallas added an OmniMix to its Scenaria-ScreenSound arsenal. Finally, **TNN**, **BET** and **NMT** mobile units each added SSL 8048 GB on-air production consoles...**Photomag** of NYC has added a second AMS Logic 2 digital console to its reopened Studio D, to go with the 24-track AudioFile...A year after opening in the San Francisco ad district, audio post

house **One Union** unveiled its second room, an all-digital suite featuring Pro Tools III and Northern California's first Yamaha 02R...**Crawford Communications** in Atlanta purchased the first Amek Angela II in the States, a 64-input version that is used for sweetening and mixing TV shows like *Hercules* and *Xena*...L² Communications, a media company founded by entrepreneur Michael Lewis and director Brett Leonard, created a sound effects division, **L² Sound Effects**, headed by noted sound designer Frank Serafine...**Encore Video** in L.A. just put a Graham-Patten Systems D/ESAM 400 into an all-digital edit suite and a D/ESAM 200 into one of three new telecine bays...**Warner Hollywood** has added WorldNet from Audio Processing Technology for use on remote ADR recording. Meanwhile, **Audio Rents** of L.A. will rent APT codecs for $200 a day...**Louisiana Music Television** upgraded its audio facilities and put in a 40-channel Allen & Heath GL4 console and a GL2 mixer...Otari Status consoles have found their way into post houses on both coasts: **C5 Inc.** in New York and **Sound Services Inc.** in Hollywood. Also, **Goldcrest** became

the first post house in the UK to take delivery of the popular RADAR 24-track hard disk recorder...Studer Editech News: **Warner Bros.** purchased two Dyaxis sytems with VideoMix for DVD mastering of the movie catalog; and in Post:Trio news, recent purchases have come from: **Post Edge** of Miami, **WSB-TV** in Atlanta, **NBC Asia** in Hong Kong, **CBC Toronto** (three systems), and **NDR** (the German state broadcast organization)...**American Zoetrope** recently put together a second temp mix for Francis Ford Coppola's *Jack*, cut by Mark Levinson on a StudioFrame and mixed by Tom Johnson...Charly Brown and Myke Reilly of **Charly Brown + Co.**, San Francisco, were hired to score the Levi's jeans commercial "Clouds."...South Florida's **Walker Fitzgibbon Television and Film** produced a Gloria Estefan music video for the official 1996 Summer Olympics theme song, which will also be the first single from her new album, *Rhythm of the Games*...Composer **Johannes Hammer** and sound designer **Jon Klok** of **Machine Head** put together the audio for six Intel spots...**Alan Ett Music Group**, which handled the music for those campy Robert Goulet ESPN college basketball spots, hooked up again with Weiden & Kennedy and ESPN on a new campaign with the unfortunate title "It's Baseball, And You're an American." Music by **Scott Liggett**...**Scene Three Audio** (Nashville) president **Nick Palladino** completed audio post on a theater trailer in Dolby Surround for Carmike Theaters...Finally, **Soundwave** (Arlington, VA) recorded and mixed a 20-piece orchestra and several ethnic-music ensembles to convey a musical tour of the U.S. through its folk traditions. The campaign was for the American Association of Travel Agents. ∎

One Union Recording Studios, San Francisco, "Studio Two."

noise reduction on prints and third-octave equalization of screen speakers, two large factors in Dolby's stated quest for bringing to the theater what the director heard on the re-recording stage.

By 1975, 6-track mixing was pretty much dead, and what films were released in 70mm were probably spreads from original 4-track mixes. The first few Dolby 70mm films reflected this scattershot approach: *Logan's Run* was mixed for true 6-track, while Barbra Streisand's remake of *A Star Is Born* was spread. Then, in the spring of 1977, came *Star Wars.*

From the get-go, it had the look of a film that would go the way of a standard 6-track spread, as it was mixed at re-recording rooms equipped only for 4-track (first The Burbank Studios, and later at Stage D at Samuel Goldwyn Studios). As the mix progressed, two Dolby employees, Ioan Allen and Steve Katz, came up with what appeared to be an elegant solution to a number of problems: Instead of using the left-center and right-center channels for a full-range spread, use those channels only for information below 200 Hz. In this manner, the theory was, you would be helping the Altec A-2 and A-4 speakers where they most needed it, on the low end; the official name in Dolby literature was Bass Extension.

Another "problem" that it solved was that theater owners were spared approximately $3,000 by not having to purchase two additional channels of noise reduction (left- and right-center, tracks 2 and 4, were not A-Type encoded) or third-octave equalization. This undoubtedly helped the sales of the Dolby CP-100 (and later CP-200) cinema processors.

With regard to sound quality, the folks at Dolby felt that this was a better solution because with theaters getting smaller and smaller (true), there was less of a hole between the center and the sides that required additional speaker channels. Furthermore, the benefits of bass extension were considered to be an improvement over the then-common practice of full-range spreads. And last but not least, a 4-track composite master (or, later, stems) could easily be converted to both 6-track and 2-track print masters.

For the next 15 years, this Dolby "baby boom" format became the de facto standard for 70mm release, with less than a half-dozen films using all five screen channels the old-fashioned way. In many ways it was a golden age for film sound (cue the music), espe-cially sound effects. But the original design of the 6-track 70mm format was all but forgotten, as it required special handling and extra cost—baby boom was really the only game in town. Then two things happened.

First, in the mid-'80s the industry adopted direct-radiator speakers, which had much smoother and tighter low-end response, thus removing the need for doubling up the low end to make up for speaker deficiencies. Some theaters installed subwoofers for maximum LF extension when playing baby boom prints, and this caused some confusion because there was a large number of ways the LF information on tracks 2 and 4 could be reproduced: with 2 and 4 only, with subwoofers only, or with both. Add to this the variable that a theater might have direct-radiator speakers, and the result was that a large number of Dolby 70mm mixes didn't use the baby boom channels *at all.*

And then, in 1992 the Sony Dynamic Digital Sound format was introduced, featuring five full-range channels, plus stereo surrounds and subwoofer, for a total of eight channels. The digital information is carried outside the sprocket holes on both sides of the film, with a standard analog stereo optical track as backup, as is the case with Dolby Digital and DTS. Although it would be

two years before production models would be introduced, SDDS has taken off quite rapidly and is now approaching 2,500 theaters worldwide.

There are still some practical matters involved, although not nearly as many as existed when Dolby arrived on the scene. Consoles are not a problem, with all standard film boards set up for 8-channel mixing and monitoring. Perhaps the only exception to this might be that few boards have 5-channel panners on each input strip, although this is primarily a matter of convenience and can be largely solved with outboard joystick panners.

The recorder situation is also essentially a non-issue, what with the ease of locking up a digital multitrack to record multiple 8-track premixes and stems. Studios that still use mag can get to eight tracks by using separate pieces of mag for the surround tracks. For example, on stems you can have three 6-tracks for the five screen channels and booms of the dialog, music and sound effects, with a fourth 6-track carrying three pairs of stereo surrounds. It's a bit awkward, yet it appears to be the best solution at this point; it seems a little late in the game for the industry to go to an 8-track mag format, especially with 8-track digital dubbers just around the corner.

Mixing in the five-behind-screen format (which in 1996 is the same as saying SDDS, Dolby and DTS both having committed themselves firmly to the standard three-speaker layout) brings with it a multitude of possibilities to sound editors and re-recording mixers. Number one in my mind will always be its unparalleled ability to reproduce the sound of a 120-piece orchestra. This is the one area where the mixes in the early days of 70mm 6-track not only hold up to present standards, but in many respects surpass work being done today.

The other aspect of five screen channels that holds the most potential, I think, is that mixers are given two stereo pairs to work with—one wide and one narrow—in creating the primary sound field. This is the delicate side of the use of SDDS, the other end being that because it adds two complete full-range screen channels to the standard 5.1-channel digital format, the ability of mixers to blow people out of the theater is even greater. Please, brother and sister mixers, things are bad enough with 5.1 digital mixes; use the 8-track SDDS format with care!

One problem that I have with Sony's implementation of the 5-channel format

is that the fold-down to three speakers is at a fixed ratio: 75% of the left-center and right-center channels go to their respective sides, with 25% going to the center. While I understand and appreciate their reason for doing so—it helps prevent loud scenes from piling up in the center, getting in the way of dialog—I wish that they had made the fold-down ratio dynamic and mixer-adjustable on a scene-by-scene basis.

Regarding practical matters in movie theaters, I believe the tide is turning. Sony has solved the cinema processor issue in that all of their SDDS units have EQ for five screen speakers; it's not an option. No more do I have to put up with people telling me "well, you *could* do it but it would be a real pain." Or: "Few theaters have five speakers behind the screen." Today, the above doesn't apply, with about 20 percent of the 1,900 SDDS-equipped theaters in North America able to play a film back in its full 8-channel glory. Hallelujah.

Although even the largest multiplex houses will never get to be the size of the roadshow 70mm theaters of yore, theater chains are building larger and larger rooms, certainly big enough for the extra screen channels to be noticeable. Last summer, I saw an SDDS film in a small screening room equipped for five speakers and later saw the film in a 300-seat theater equipped with only three screen channels. Not only were the high-res aspects of five channels evident in the screening room, the holes between the sides and the center were painfully obvious in the 300-seat theater, which was not big even by today's standards.

If you don't think the added channels behind the screen make a difference, well, then, a) you have either never heard one of the great 6-track 70mm mixes or have never mixed in the format, or, b) we'll just have to agree to disagree. I think there is simply no comparison between five and three channels behind the screen, and since the format is here for me to use, I don't have to try to convince anyone again.

Let me know your favorite 6-track mix by writing to PO Box 24609, New Orleans LA 70184, fax (504) 488-5139, or via the Internet: swelltone@aol.com. ∎

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be that it's in the Central time zone. He is easily amused.

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PHOTO: DAVID HAVENHISCH

RECORDING CASSANDRA WILSON'S "NEW MOON DAUGHTER"

by Robin Tolleson

Before Lonnie Plaxico's massive acoustic bass begins the slow, steady groove of the Billie Holliday vehicle "Strange Fruit," before Chris Whitley's resophonic guitar interjects its slightly scary, disjointed song and Butch Morris' cornet takes the action heavenward, you can hear Cassandra Wilson lighting a cigarette, a gesture setting a symbolic spark to the smoldering air of her top-selling new jazz-pop-folk album, *New Moon Daughter.* "I have a tendency to roll tape all the time, so stuff gets caught," says producer Craig Street. Engineer Danny Kopelson adds, "I think we might have pulled that match strike up a little bit, but it was in front of the tune just as she laid the vocal. It was hard to resist that, especially given the context of the tune."

After working with Wilson on her previous Grammy-nominated release, *Blue Light 'Til Dawn,* Street knew that Wilson had few limitations or preconceptions. That made it easy to experiment with material (covers of Hank Williams, U2, The Monkees, Hoagy Carmichael and Neil Young accompany five Wilson originals) and instruments, as Street explains. "I felt that Cassandra and her audience were ready for a more solid move in the direction that we started on the last CD, switching from standard jazz ensemble instrumentation—piano, electric bass, saxophone—to a slightly perverted version of that—acoustic guitars, violin, mandolin, smaller percussion, upright bass, no keyboard, pedal steel, accordion, slide guitars, banjos, pump organ; those things are real pleasing to me. Along with the cornet they make some beautiful music. To push this one even further, I brought in a second guitar player, Kevin Breit, and a drummer who isn't

PHOTO: STEVE PYKE

"POGUE MAHONE"
IT'S GAELIC FOR "ANOTHER COOL POGUES RECORD"

by Barbara Schultz

The Pogues have always been a great band, no matter which configuration of members you've managed to catch. The group's original mix of punk, Irish traditional and any number of other cultures' music has been a blast since they started playing London pubs in the early '80s. A breathless history for the uninitiated: The Pogues (first called Pogue Mahone—Gaelic for "kiss my ass") were started by a group of London friends who shared an unbridled enthusiasm for punk and also for Irish music. The Pogues, in their earliest recognizable form

consisted of Spider Stacy (penny whistle), Andrew Ranken (drums), Jem Finer (banjo), Cait O'Riordan (bass), James Fearnley (accordion) and Shane MacGowan (guitar, lead vocal). After playing around awhile, they gained both popularity with the pub crowd and a formidable reputation for debauched exploits. In a book about The Pogues, *The Lost Decade* by Ann Scanlon,

MacGowan describes those early nights: "'We were blind drunk whenever we did it,' admits Shane. 'We were blind drunk because people kept buying us drinks! But there was an energy there... And we just thought, f___ it, what we're doing is good however badly we're doing it, it's good 'cos it's based on good music. It's emotional. It's what songs are about.'"

Their first album, *Red*

Roses for Me, was recorded at Elephant Studios and produced for Stiff Records by Stan Brennan. Highlights of this rough and not-quite-ready collection include the MacGowan original "Streams of Whiskey" and the lovely traditional song "Kitty." Their next record, *Rum, Sodomy and the Lash* was also recorded at Elephant and produced by Elvis Costello. That record

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THE KENNEDYS
"LIFE IS LARGE" ON THE ROAD

by Barbara Schultz

Life Is Large is the second sweet, folky power-pop album by Fairfax, Va.'s The Kennedys. This husband-and-wife duo—Pete and Maura—have been songwriting (and life) partners since 1992, and they share an affection for pretty harmonies and great guitars.

The title track on the album (on Green Linnet's Red Bird label) is a sunny, clever song with a big, jangly sound. It was recorded in five different studios, using five house engineers, during the course of the Kennedys' summer '95 tour. They started in their home studio,

Gypsy Wagon, by making an 8-track demo on a Tascam DA-88: rhythm guitars, a drum machine, bass and vocals, all cut by Pete and Maura themselves. Maura Kennedy notes that she likes singing into a Microtech Gefell UM-70 because of its "nice airiness." She also feels good about what the comforts of home contribute to her relaxed singing performance.

Next, they went over to Omega Recording in Rockville, Md., with their drummer (Vince Santoro) and bass player (Wade Mathews) to assemble the basic rhythm track. They laid the original demo onto 2-inch analog and, keeping the original rhythm guitars, recorded the bass and drums. The bass was taken direct; drums were

TAMMY WYNETTE'S "STAND BY YOUR MAN"

by Blair Jackson

She was born and bred deep in the heart of Mississippi, but Tammy Wynette was the undisputed Queen of Nashville in the late '60s and throughout the '70s, when she landed a whopping 29 songs in the country music Top 10, with 17 of those hitting Number One. And the biggest of all those smashes was 1968's "Stand By Your Man," which remains the best-selling single by a female country singer to this day. The song was produced and co-written (with Wynette) by another country music legend, Billy Sherrill, an Alabama native.

Let's talk about Sherrill first. He was born Phil Campbell, the son of traveling evangelists. His initial musical experiences were mainly playing piano for his parents' prayer meetings, but as he got older he took up the saxophone and began playing secular music in honky-tonks throughout the southeast. He grew weary of life on the road after a while, however, and settled in Nashville, where he worked as both a songwriter and as an engineer in the Nashville studio of Memphis-based producer Sam Phillips. It wasn't long before Sherrill had carved out a good reputation as a producer and songwriter, and in the mid-'60s he signed on as a staff producer for Epic Records, which was just getting a foothold in Nashville. His early successes included records by David Houston and Andy Griffith, and then along came a beautician and would-be country singer named Wynette Bird...

Actually, she was born Virginia Wynette Pugh in 1942 near Tupelo, Mississippi (Elvis' birthplace). Her father died when she was less than a year old, and her mother moved to Birmingham, Alabama, to find work, so Tammy spent the first few years of her life living on her grandparents' Mississippi farm. When she was old enough to chop cotton and bale hay she did, but at least she was paid for her efforts. Her mother came back into the picture following World War II, and it was she who paid for Tammy's guitar and piano lessons while she was still a pre-teen. All during high school she played music casually with friends whenever
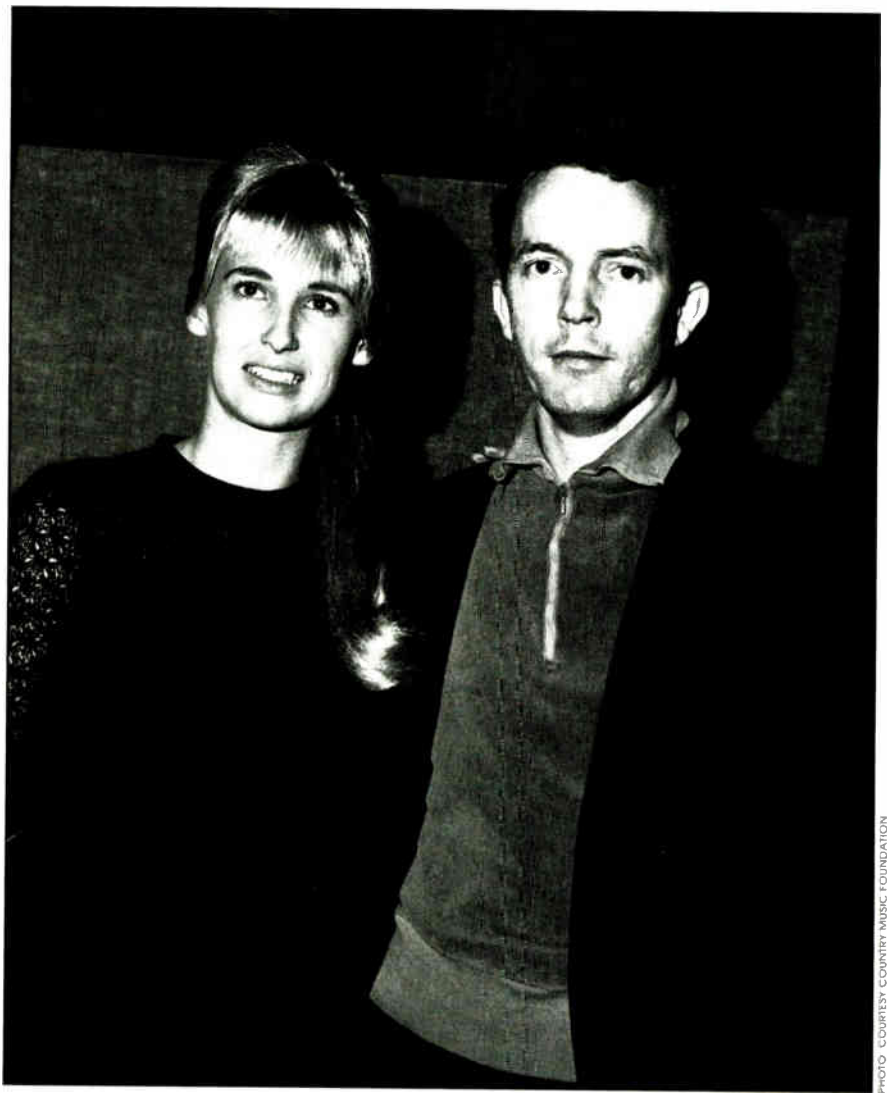
Tammy Wynette and Billy Sherrill

the opportunity arose, but she put her dreams of a career in music aside when she dropped out of school at 17 to get married. Shortly after that she had her first child and, to help support the family, she took a job as a hairdresser. She had a second child in short order and was pregnant with a third when she split up with her husband.

At this point, Tammy moved to Birmingham and worked in a beauty shop until the baby was born. When her newborn developed spinal meningitis, medical bills landed Tammy seriously in debt, so to augment her beautician's salary, she managed to get a job as a performer on a local TV show, *The Country Boy Eddie Show*. That led to other opportunities to sing at clubs in Tennessee and Alabama. At the same time she developed a writing relationship with a man named Fred Lehner, who helped her hone that aspect of her craft. The next step was a record deal, so naturally Tammy headed to Nashville. She had been turned down

by four labels there when Billy Sherrill at Epic heard some of her songs and decided to take a chance on her. She signed with the label (as "Tammy Wynette") in 1966 and by the end of that year she had her first hit, a version of Johnny Paycheck's song "Apartment #9." It was only a matter of months before she landed her first Top 5 song, "Your Good Girl's Gonna Go Bad," and that was followed in close order by "My Elusive Dreams" (a duet with David Houston), "I Don't Want to Play House," "Take Me to Your World" and "D-I-V-O-R-C-E," all of which hit Number One on the country charts.

Most of the early Wynette-Sherrill sessions took place in Studio B at the old Quonset Hut in Nashville, built originally by Owen Bradley, but owned and operated by CBS by the time Wynette's career was rolling. Although the newer Studio A already had a 16-track by the time the session for "Stand By Your Man" took place in late '68, Sherrill often opted to work on the 4-

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track in B, a room noted for its excellent acoustics, and that was the case with this session. Engineering the session was veteran Tom Sparkman (see Dan Daley's roundtable discussion with "Nashville's Original Engineers" on page 92) who had been onboard for "Apartment #9" and other Wynette-Sherrill sessions in between.

"Billy Sherrill was just a super dude," Sparkman said recently. "The thing about him was that he was always very easy to communicate with. He knew what he wanted and he knew how to get it without it being a big hassle. He had done some engineering work for Sam Phillips; that's where he got started. Not only did he know a bit about engineering and mixing, he was also a fine musician, a good arranger and a heck of a songwriter. So he had it all rolled up into one. We got along very well together."

Wynette's appeal came from her image as a plain-spoken working-class girl who'd risen to the heights of stardom through her God-given talent and hard work.

At that time, the control room in Studio B was equipped with a console that had been custom built for Decca some years earlier. "It was basically a 3-track console," Sparkman says. Typically, he'd use 15 or 16 inputs on a session: "In that era with that type of song, we might have only two or four mics on the drums, whereas later on we might put nine or ten on a drum kit. In those days, country stuff didn't use a lot of tom-toms, so you'd mic the bass drum, the snare and the cymbals. If we did an over-the-head-type miking, we'd probably use a [Neumann] U67, turn it 90 degrees and have it pointing down." Sparkman says he also used various Electro-Voice mics on the drums.

Among Sparkman's other preferred mics were a U67 for lead vocals—"I'm certain we would have used that on Tammy," he says; a Western Electric 639 on piano; Neumann U47s on vocal

groups and sometimes strings; and RCA 77 on stand-up bass. Depending on the requirements of the track, he would sometimes go direct on lead guitar and/or pedal steel. "Actually, we didn't have hard and fast rules; we just did whatever worked." The studio had eight EMT plates; reverb was usually the total extent of the processing on most tracks of that vintage.

Playing on "Stand By Your Man" were several of the town's A-list regulars, including lead guitarist Jerry Kennedy, Ray Edenton on rhythm guitar, Bob Moore on bass, Pete Drake on steel guitar and Buddy Harman on drums.

Sherrill once commented, "The 'Nashville Sound,' in my opinion, is what you get when you turn the session over to the musicians. In order to really sell, a record has to be different rather than just pretty."

As was Sherill's preference then, the song was cut completely live. "Generally speaking, you might have a few false starts or mistakes and end up at take 12 or take 17 or something like that, and occasionally you might actually put the song together out of four or five pieces. But with 'Stand By Your Man' it's a good chance that it was a complete take and it was probably between [take] six and ten," recalls Sparkman, who notes that Tammy Wynette "was always very professional. She cooperated and didn't act like she was big stuff. She was always really a part of it; nice to work with all the way around."

Clearly much of Wynette's appeal came from her image as a plain-spoken working-class girl who'd risen to the heights of stardom through her God-given talent and hard work. "D-I-V-O-R-C-E" was one of the first popular country songs to deal so explicitly with that subject, and "Stand By Your Man" was enormously controversial when it was released, during the first major wave of what was then commonly known as the Women's Lib movement. "I have had so much criticism for that song," Wynette once said, "but the line that [the feminists] complained about—'If you love him, you'll forgive him/After all she's just a woman' they took it the wrong way. I didn't sing the song to say 'You women stay home and stay pregnant and don't do anything to help yourselves. Be there waiting when he comes home because a woman needs a man at any cost.' That's not what I was saying at all. All I wanted to say in the song was 'Be understanding. Be supportive.'"

Later, the five-times-married Wynette

wryly noted, "I guess I've proven that I don't believe in staying with a man you no longer love." Her most famous union was with country great George Jones from 1969-1974. The ugly details of that relationship were chronicled in Wynette's 1979 autobiography, *Stand By Your Man*, and a 1981 TV movie of the same name.

Billy Sherrill and Tammy Wynette both enjoyed enormously successful careers, both together and apart after the success of "Stand By Your Man." Sherrill produced all of her hits until 1980, and while the hits haven't come as frequently the last 15 years, she continues to be a force in country music. Sherrill went on to work his production and songwriting magic with artists like Charlie Rich, Johnny Paycheck, Tanya Tucker and many, many others. By the mid-'70s he was elevated to VP of A&R at CBS Nashville, and his place in country music history was secure. ∎

primarily a jazz drummer, Dougie Bowne [Iggy Pop, Lounge Lizards]."

Street calls himself a "performance-oriented" producer, and with that in mind, he suggested that Wilson record in The Barn at Bearsville Studios in upstate New York. "I wanted everybody in the room at the same time," he says. "We were actually the last people to use The Barn in its previous incarnation as a rehearsal space. Cassandra really dug it up there. She's from Mississippi, and it was a cool thing for her to be in that space. The percussion is a little less heavy. In a sense it's almost an acoustic Led Zeppelin thing, with the guitars and singer out front and the rhythm section back a little bit, and everybody in the same room."

There were a lot of live takes on the record, according to the producer, and just one overdubbed vocal. And thanks to the relaxed, rural atmosphere and the blocked-out studio time arrangement, Street reached his goal of cutting a song a day. "Cassandra had recorded some of the cover tunes on acoustic guitar, and Brandon [guitarist Brandon Ross] did arrangements based on her tapes. We would go in, have coffee, hang out in the morning and just start running through things. With musicians as good as these, I don't think they should be allowed to practice too much, because it gets too studied—it's not as spontaneous. We'd start shaping a tune, and usually start tracking by the afternoon. Most things were done within three

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takes. So by early evening we'd have a basic track that we liked, and we'd do any fixes that were absolutely necessary. We'd immediately start on overdubs."

A wary Wilson referred to Street as "the saboteur" during the making of *Blue Light 'Til Dawn*, but she learned to trust the producer. "He's got some very unusual ideas about instrumentation, which are right up my alley," she told the *New York Times*. "I like moving into the unknown, so we share that passion for creating different stuff. It's a stream-of-consciousness, intuitive thing. He throws ideas out there, and I get inside of them. Craig and I have our arguments, but the important thing is that our personalities mesh musically."

"Cassandra's been involved for a while with the typical jazz instruments," Street says, "and it took a little time for her to understand how useful it might be to approach improvisatory music with instruments, like guitars and banjos, that are even more traditional. I think Cassandra likes the way her voice sits so nicely over those instruments. She's got a luscious kind of contralto, and those instruments set up a great bed for that kind of voice. There's a tendency to stick her with a tenor sax or trombone, things right in her range, as opposed to things that are a little bit outside of it."

Since The Barn had been a rehearsal space, not intended for tracking, there was only a P.A. mixer in the room (a Peavey AMR 2400), which was in the end only used for playbacks. Instead of bringing in another mixing console, Street and Kopelson wound up just matching mics to Neve, Daking and Avalon mic preamps. "It's really boring to just use whatever board is there," Street says. "I really like mixing up different pre's with different instruments and different mics. You can match the Coles mics up with any of the mic pre's that are good for getting a lot of gain and no noise."

Kopelson smiles as he remembers the setup. "It was a potpourri of out-boarded preamps and EQs that were just culled together to make a series of input chains, which is essentially what a console is anyway. But the fun was in mixing and matching, and getting clear and simple paths to take. So we could go straight to a preamp and maybe an EQ of our choice, and from there to tape, which is a shorter and more efficient way to the tape than most consoles. It really worked for us. The comfort of the musicians, the rehearsal vibe of the room, and every-

thing that went down technically had that degree of informality and comfort. So I think that was a good part of making that happen."

Without any control room isolation, Kopelson used headphones. Street opted not to use headphones during the actual recording. "We'd do basic sounds through speakers when we were getting stuff ready, and then Danny would go under 'phones," says Street. "I'd listen to takes out in the room so I could hear everybody. From a technical perspective, the things that are important to me are what I listen on, the monitors, and the basic beginning of the record chain, the mics and the pre's. I almost don't care what kind of board it is, or what the tape machine is. I like certain kinds of tape machines, but as long as I know what's going to the tape is starting at this really pure end, then I'm happy. It allows us to work anywhere." At Bearsville, Street and Kopelson recorded onto two Studer 800 MkIIIs.

"What I liked when I started working with Danny was that he just doesn't go in and start turning EQ knobs," Street continues. "He'd change a mic or move it around or something. You can always mess a sound up later on; you can always do something with it then if you track it in a way that's kind of true to what the instrument is. I like altering sounds later if I need to or want to."

Street liked the monitor speakers at Bearsville so much he took them with him when he left. "We did the whole record using a set of Pro-Ac Studio 100s that showed up in the studio when we got there, and I actually told Mark [studio manager Mark McKenna] I was taking them. We tracked the record on them, mixed it on them. I felt comfortable just hearing sounds for a short time and then not hearing them through speakers until playback. It was just coming back so accurately."

The lack of a control room was refreshing change for Kopelson, who enjoyed not having to communicate back and forth through the glass. "It was never a case of getting on the talkback," he says. "Since we were all in the same room, it felt like there was no difference between us. We were all part of that. If any talking had to be done you just opened your mouth."

"I'm interested in performances that are a little more raw than people would like them," Street says. "The songs and actual performance are more important to me than anything else. And some of the accidents that happen because you

have to set up in a rather rapid way and you don't know what's really going to go on, those things that happen are wonderful. If you listen to the beginning of the Neil Young song you can hear coffee cups being put into saucers and jewelry rattling. But that song worked because it really sounded like what it was when it went down."

On "A Little Warm Death" you can hear Wilson's fingers snapping, hands clapping and slapping her thighs. "I like the way that sounds," Street says. "She's so performance-oriented she pretty much just sings all the way through, and if it's helping drive her performance, that's a part of it and it goes in there." In the evening when the studio got quiet, they could hear the frogs outside, and even those were recorded and folded into the ambient terrain of Young's "Harvest Moon."

The acoustic bass, as played by Lonnie Plaxico and Mark Anthony Peterson, is beautifully recorded. Street and Kopelson miked the instrument with a Neumann 67 and a Coles, using no direct signal at all. "Lonnie has a lovely sounding bass, and I like the massive bass sound, so I've really been pestering Danny with these Coles," says Street. "I use them on guitars, drums, bass, pianos and whatever else. Danny's got a great way of sticking one up and one down on bass and capturing how the instrument sounds in the air."

Wilson's cover of the U2 song "Love Is Blindness" features some exquisite guitars, captured with a combination of the Coles mics and a pair of KM254s, the old tube predecessor to the KM84 transistor mic popular today. "It's two nice technologies, both of which are on the warm side," says Kopelson. "A ribbon mic, the Coles, for the bright side of the instrument, and the older, slightly brighter tube KM series for the dark side." They also used an AKG C-60 for some overdubs.

The producer knew that drummer Dougie Bowne was sure to introduce some nontraditional drum sounds. "Dougie is a real sensitive player who has that combination of understanding and having played jazz, but also understanding and having played rock 'n' roll stuff and ambient percussion-type things. He does a lot of weird stuff—he might play brushes on a box, or on a suitcase. The floor tom on 'Love Is Blindness' has a towel on top of it and he's just playing it with his hands. On 'I'm So Lonesome' he plays brushes on the snare, with his T-shirt over the drum. He plays on lampshades and

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tunings that are really strange. And those tunings inspire the other guitar players. If jazz by nature is simply the willingness to explore and to take risks, perhaps a lot of the older jazz artists were more daring than the younger artists. They had some pretty insipid pop tunes in the '50s and '60s, but by the time Sonny Rollins or Coltrane or Miles got through with one, it was awesome. Cassandra is one of the few people working in jazz at this point who is willing to go into almost any kind of tune, completely take it over and make it her own. And it's funny, on 'Last Train' her singing is probably the most jazz-like that it's been in a while.

"This is the ideal situation from the producer's standpoint," Street concludes, "because Cassandra's an artist who can be pushed, but has the ability to push back. She's very bold, and that makes it exciting for somebody like me that doesn't have any particular boundaries. It really opens it up in terms of creative possibilities. It's a pleasure to work with someone who's not afraid of doing something and having it be wrong." ■

includes some of the group's most rowdy and also sweetest songs, such as O'Riordan's breathy interpretation of the traditional "I'm a Man You Don't Meet Every Day" and MacGowan's tragic "The Old Main Drag." MacGowan has always voiced an admiration for the great Irish writer Brendan Behan, and this record captures exactly what Behan represents about Irish art and life: that great joy of life that's inseparable from life's great sadnesses—an emotional intensity that's intoxicating on every level. The second record also adds acoustic guitarist Philip Chevron to the group. Chevron went on to write some beautiful songs for the band, a couple of which he offered in his own sweet falsetto.

Costello has said that he wanted to produce The Pogues before some "real producer" got a hold of them, which is exactly what happened next, to wonderful (albeit slicker) effect: *If I Should Fall From Grace With God* was produced by Steve Lillywhite and features guest vocals by Kirsty MacColl, as well as two more additions to the band: multi-instrumentalist/singer Terry Woods, and Darryl Hunt, who replaced

the angel-voiced O'Riordan on bass. Next came *Peace and Love* (also produced by Lillywhite) and *Hell's Ditch* (produced by Joe Strummer), each of which contain some brilliant moments and exponentially less participation by MacGowan. I read somewhere that Shane MacGowan said that when they started The Pogues, he became the lead singer because it was between him and Stacy and, at the time, Stacy "fell down more." At some point, those roles radically reversed, and MacGowan was excused from the band in 1991. The Pogues hung together and went on to make *Waiting for Herb*, with Stacy singing, and which included the minor modern rock hit "Tuesday Morning."

Leaving out any number of details, this brings us to the present and The Pogues' latest release, *Pogue Mahone*, on Mesa/Bluemoon Records, which features yet another lineup. Terry Woods, Philip Chevron and James Fearnley have left the band and been replaced by James McNally (accordion, piano, whistles), Jamie Clarke (guitar) and David Coulter (mandolin, violin, percussion). The album was recorded and produced at London's RAK Studios by Steve

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Brown, whose credits include such diverse acts as Wham, The Cult, Alison Moyet and Freddie Mercury. Brown also recently mixed Shane MacGowan's first solo album, *The Snake*, which is one of the reasons he ended up with the Pogues gig. "Shane had made his album," Brown recalls, "and they'd been a long time on it, and I think they got lost, quite frankly. I went in and fixed it up and [The Pogues] heard the result. They'd heard the album going along bit by bit, so when they heard the finished mixes, they thought, 'Wow what suddenly happened to this album?' and they had me in for a meeting. We had lunch, and they said, 'Would you like to do the album,' and I immediately said yes, because I love that type of music."

The songs on *Pogue Mahone* were arranged with a back-to-Pogues-basics approach, which means the fast ones are pretty raucous, and they all feature a fair amount of Irish instrumentation. There are compositions by a variety of bandmembers and a couple of covers. Brown says that he and the band agreed that "with *Waiting for Herb*, they'd gone into sort of a world-music thing; they weren't doing enough Pogue-y stuff. I wanted to get it back into the Pogues' foot-tapping beat. We'd go through the songs and we'd get to a certain section, or maybe a whole song, and I'd go, 'No, this isn't it. Just play the bass drum every beat: one, two, three, four, and then put a little snare drum in the middle, and off you go.' And they knew exactly what I was talking about. So that was basically all the pre-production: getting that sorted out and then making sure the key was fine. The arrangements were in great shape; they're very clever musicians and writers."

Brown doesn't like to waste time—his or anyone else's—so he used Plexiglas partitions to divide RAK's large recording room, allowing enough isolation, but also enough communication, for all of the members to play at once. "I made it a team thing," he explains. "It's not good having half the band sitting around doing nothing and the other half working twice as hard as anybody else, so they all had an instrument, even the multi-instrumentalists. In the back half, I had the drums, and in the front half, I had all the acoustic instruments, and all the electric instruments were with me in the control room. It worked well, and I think the only time they really started to think, 'Oh, God, why did we get this guy?' was when I insisted on cutting the backing tracks live. So if one of them messed up and threw the others out, it

was basically stop tape, rewind and start again. But I did want to get as much of a sort of band-ly thing as possible. I wanted to get to the stage where I could just put a lead vocal on the backing tracks, and I should have an album in place."

Most of the tracks were recorded live; the elements Brown added later were instrument solos, such as the whistles, uilleann pipes, violins, plus Stacy's lead vocal and the Electra Strings quartet, who play on "Pont Mirabeau," an Apollinaire poem that Jem Finer's father translated and Finer set to music.

> ## There's very little I can say against microphones; compared to loudspeakers, for example, they're quite strong in the old chain of recording.
> ### —Steve Brown

Brown says that RAK was ideal for the project, both because of the large, flexible recording space and because of the facility's vintage, custom API desk. "I happen to think it's one of the best consoles in the world. If you're listening, API, I wouldn't mind a couple of modules," he quips. "I believe their mic amps to be really good, true, beautiful things. This desk is really quite old now, but the maintenance guy at RAK, he cherishes the thing, and it's in great condition. And it's got that very small monitor section—32-track monitoring—and a little fader travel—the whole section sounds great." RAK's monitors include Tannoy mains and Yamaha NS-10s powered by Quad 520s.

Brown recorded The Pogues using most of the studio's inventory of condenser mics. "Anything as old as I possibly could get," he says. "Mainly, I'm a firm believer that you only put dynamics out if you're not getting the character out of a good condenser mic. I love all Neumann mics. I love most condenser mics. There's very little I can say against microphones; compared to loudspeakers, for example, they're quite

strong in the old chain of recording.

"I am also very much one for not putting the equalizer straight in," Brown continues. "I'll listen to the instrument, make sure that's in good shape, and I will then make a choice of microphone and microphone amplifier, and I will change them many times before even thinking of equalizing. In other words, I like a good, flat sound. I mean, I can't honestly say, 'If you've got an accordion, stick an 87 on it,' because it might not be the right room and the right accordion, so I stress to all you young engineers out there, get it sounding right at the mic stage first before you even reach for that equalizer."

Brown says he spent a good day or two trying out mics and making his choices. On Andrew Ranken's drum kit, he used a pair of Neumann U47s, a Sennheiser MD-421 on kick drum and an AKG C-414 on the snare. Darryl Hunt's bass was DI'd, as were all of the electronic instruments. On the acoustic instruments, accordion was miked with a Neumann U87, banjo was a U84, acoustic guitar was a C-414, and on the string quartet parts, he says he used a selection of Neumann condensers. Whistles were sometimes an 84 and sometimes a Shure B58.

And on vocals, Brown says, "Now here's the man who was just telling you that everything should be condenser mics. For Spider's vocal, I had every type of microphone out, and eventually we settled on a Shure B58, which went into a Focusrite. I ended up picking that because it was kind of in-your-face. It was more like his live vocal. He sort of growls at the microphone. It made that *good*—a nice edge of distortion to it." On backing vocals, Brown used Neumann U87s.

Brown and The Pogues spent about four weeks in the studio, recording on a Studer A800 MkIII to 499 tape. Overall, he says, the recording process "was bloody good fun. Having gone through all that technical chit chat, we had an absolute party in there. They've all been around the block, and they've all got great stories, and they're a very tight band friendwise. They're also major football supporters. That's the only time they got at each other, because they all supported different football teams. I've got to say, I've never had such a laugh in my life—early mornings, late nights, good food. They eat well. I wouldn't have been surprised to see a lobster in the control room or something like that."

Brown mixed the album at Raezor

COAST TO COAST

L.A. GRAPEVINE

by Maureen Droney

If anybody knows how to do it right, it would be the folks at Mad Dog Studios. After 16 years of turning out lots of good music from a cramped storefront studio in a funky part of Venice, partners Michael Dumas and Dusty Wakeman have opened a new 3,000-square-foot facility in Burbank. The new Mad Dog features a spacious control room, a 1,000-square-foot recording room with three 150-square-foot iso booths, a full kitchen and, that always important item, ample secure parking. In the same complex, and set up with tielines to Mad Dog's control room, is a 40x60-foot soundstage, used for film, video and recording of live performances or showcases. The console is a 48-in Neve 8108 with custom patchbay and Necam 96 automation, and new/old equipment includes an (Look out, they're coming around again!) MCI 2-inch, 16-track that can be locked with the Studer A800 already in place.

Dumas and studio manager Astrid Young showed me around, and I can vouch for the fact that they've kept the musician-friendly

Mad Dog owners
Michael Dumas and Dusty Wakeman

NASHVILLE SKYLINE

by Dan Daley

At a time when rates and profitability have been pervasive and troubling issues within Nashville, the musically fertile areas just south of town are experiencing a mini-boom. Though the Franklin and Brentwood areas have long been home to a number of elaborate personal home studios, the region is now seeing dedicated commercial facilities springing up. Already

Bad Company recently mixed their new album in Masterfonics' The Tracking Room (Nashville). Seated at the SSL 9000 J Series console are (L to R) studio owner Glenn Meadows, engineer Ben Fowler and producer Josh Leo. In the back are bandmembers Robert Hart (vocals) Rick Wills (bass), drummer Simon Kirk and guitarist Bucket.

home to the two-year-old Sound Kitchen, owned by Jon and Dino Elefante. Franklin has two new facilities that opened within the first few months of 1996.

The Border takes its name from the former Mexican restaurant that sat along Franklin Road. The facility opened in mid-February with a mix room featuring an SSL G Plus with E modules (formerly at Hit Factory and *Saturday Night Live*), a Mitsubishi X-850, Otari DTR-900, Studer A827, Tascam ATR-24 and three Alesis ADATs. Hard disk editing is done on a Digidesign Session 8 system with an ADAT interface.

SESSIONS & STUDIO NEWS

SOUTHEAST

At Nashville studio **Recording Arts** **Claudio Cueni** was in mixing a **J'son** song with producer **Chris Stokes** for the soundtrack to an upcoming Whoopi Goldberg movie. Producer **Scott Rouse** was in mixing comedian **Jeff Foxworthy**'s next LP...**Prairie Oyster** tracked for BMG/Canada with producer/engineer **Mike Poole** and engineer **Ken Hutton** at **Sound Emporium** in Nashville. **Connie Smith** was also in with producer **Marty Stuart**, producer/engineer **Justin Niebank** and engineer **Ken Hutton** tracking for Warner Bros....At Nashville's **Masterfonics**, **Tanya Tucker** tracked for Capitol with producer **Greg Brown**, engineer **Rob Feaster** and assistant **Chris Davie**; and **Etta James** was in overdubbing for the Private Music label with producer **Barry Beckett**, engineer **David Hall** and assistant **Pete Greene**...**Jimmie Vaughan** continued tracking and overdubbing on a Sony Records project in studios A and B at **Ardent** (Memphis), with producer/engineer **John Hampton** and assistant **Matt**

The control room at FlatWood Studio features a vintage MCI 428 B with Otari DiskMix II automation and 24 tracks of ADAT with BRC. Located on a secluded 40-acre ranch in Lebanon, Tenn. (a half-hour east of Nashville), the studio has hosted sessions for Australian band Keith Urban and 4WD recording for Warner Bros., IRS artist Vernon Rust and guitarist Gypsy Carns.

Martone. **Dr. John** contributed piano to several cuts. Also in the studio was French R&B artist **Eddie Mitchell**, tracking for Polydor/France. Session players included the famed Muscle Shoals Rhythm Section of **Roger Hawkins** and **David**

In business 32 years, the recently refurbished Hilltop Studios is one of Nashville's longest-running facilities. Pictured is Studio B, featuring a Neotek Elan console with Uptown 990 moving fader automation. Recorders include Sony APR-24 analog and 3324 digital machines.

Hood. **Ian Taylor** produced and engineered with assistant **Erik Flettrich**...At Miami's **Criteria Studios**, chart-topping Japanese act **Ulfuls** wrapped up the mixes for their new Toshiba/EMI release. The band produced with **Jiro Koyasu**, and **Tom Durack** engineered with assistant **P. Mark Dobson**. The indefatigable **Aerosmith** continued work on their forthcoming Columbia release. Producer **Glen Ballard** oversaw the sessions in Criteria's Neve 8078 and SSL 4096 G Plus rooms. **Chris Fogel** and **Francis Buckley** split the engineering duties, assisted by **Keith Rose**, **Chris Carroll**, **Shad T. Scott** and **Paul Gordon**...

SOUTHERN CALIFORNIA

Jean Marie Horvat mixed the next Priority release for **The Truth** at **The Enterprise** in Burbank with assistant **Jeff Griffin**. **Bob Brown** was also in tracking the new **Gables** release for Warner Bros. with **Dave Hancock** assisting...The **Bee Gees** have been camping out at **Record Plant** (Hollywood), tracking in the studio's Neve 1 room with producer **David Foster** and engineers **John**

NY METRO REPORT

by Dan Daley

Changes in the New York recording market are driving studios into the virtual realm, and I don't just mean digital recording. Websites as marketing tools are becoming more common. How effective are they? I talked with some studios that have pursued the tactic.

Will Schillinger, owner of Pilot Recording, was an early adapter of the Website approach to marketing, putting his site (www.interport.net/~pilot) up nearly two years ago. He says it has been effective in bringing in new clients, particularly some jazz clients from overseas. It's brought even more resumes and in some instances new employees, and, via the e-mail option, it's widened his range of contacts everywhere except perhaps within New York. "The best thing about it is the 24-hour instant accessibility," he says. "It's a high-gloss flyer that can be updated easily. The thing is, you do have to work to keep it current."

Greene Street Recording studio manager David Harrington says the studio's site is undergoing a reconstruction at the behest of owner Steve Loeb, who wasn't pleased with the initial site's appearance. "Steve's demand is that the site look as cutting-edge as possible," Harrington says. "It's pure image you're dealing with here. If your site doesn't look cutting-edge and looks dated, so does your studio. I'm not sure what the ultimate effectiveness of a site

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vibe of the old Mad Dog while expanding, upgrading and improving.

Dumas and Wakeman, Texans who met up in L.A., are both engineer/producers with combined credits of Dwight Yoakam, Jim Lauderdale and Lucinda Williams. Manager Young is a successful singer/songwriter who has worked with Neil Young and Heart. All of them have definitely paid their dues, and it's that experience that comes through in the feel of their facility. "We've lived it for so long—we know what you need and where you need it!" Dumas laughs. "Little things like, the iso booths all have high ceilings. And there are ¼-inch cable feeds through all the walls so that you can be in the control room and run a cable to the amp or the speaker out in the studio, without running a cable all the way around. The headphones all have their own 8-channel mixes, which really frees up the engineer. And we made sure the wiring was right—that's something you just can't chintz on. That's where you hear the difference."

Dumas explains that the complex had originally been a rehearsal studio that he and Wakeman had used in their work with Yoakam. "We knew the building," he says, "loved the location and the layout, and we kind of modeled what we were searching for after this setup. We looked for six or seven months, at 80 to 100 buildings, but we didn't find one that compared to it. Then one day, I was driving down the street and saw the 'For Lease' sign nailed up on the wall and went, 'Yes! It's finally available!'

"We got the building July 17," he continues, "and started demolition then. On August 1 we started construction, and then we worked, literally around the clock, until we had our grand opening party on Halloween. We took the first off to recuperate from the party, and started tracking on a Dwight Yoakam album November 2."

Mad Dog has accumulated an impressive selection of mics over the years, including tube 67s, C-12s and a C-28 and U-47. Other plusses are the C7 grand piano, the guitar and amp collection (Silvertone, Vox and Fender), along with a few other vintage goodies, including, for you keyboard mavens, the Optigon optical disc player (circa 1969).

All in all, it's happy camping at Mad Dog these days. Although you'll frequently find Dumas and Wakeman recording at their own studio, both also work on a wide range of projects in other studios, as well as run Little Dog Records. Other engineers who regularly find themselves ensconced in the control room are David Leonard, Neal Avaron, Ray Blair and John X. Artists in since the grand opening include Yoakam, Scott Joss, Pete Anderson, Reach Around, Dirk Hamilton and world-record-holder (40 songs in four days!) Phil Cody, recording his debut Interscope release.

Tonewood Studios, part of the Power Plant Entertainment Group, opened in North Hollywood in December, featuring the only Oramsonics console in the Los Angeles area. The 32-in desk was designed by John Oram (known for his preamp designs and for his work with Malcolm Toft on the Trident B and C Range consoles) and is described by Tonewood owner Scott Gaines as "a fabulous board." For tracking, there is a 19x19-foot recording space with two iso booths and a Chickering grand piano, along with a worthy complement of MIDI gear.

Gaines, who is a producer and musician, owns Tonewood with partner and engineer Michael Sena. The two brought their respective talents together from divergent backgrounds: Gaines had been a studio owner in Calgary, Alberta, and Sena in Kauai, Hawaii, before teaming up in L.A. to create Tonewood.

Now Sena and staff engineer Franco Giovanni keep Tonewood running smoothly while Gaines handles production chores and coordinates the other businesses under the umbrella of Power Plant—including the upstart management company Williams, Gaines & Lowe, which he helms along with Chase Williams and Terry Lowe. WGL is growing fast, with a roster that includes singer/songwriters Lamya and Robert Vaughan, The Truants (a band of 16-year-olds from Van Nuys High who are generating a big buzz on the street) and Scottish world music artist David Alison, who is working on his third album, to be released on U.K. Records. Although WGL artists can often be found recording at Tonewood, the busy studio is definitely open to the public, having hosted projects by Robbie Krieger, T. Lavitz from the Dixie Dregs, guitarist Marty Rifkin and Coco Montoya.

Also in North Hollywood, One Step Up was created by Dan O'Connell and John Cucci for just one purpose—creating Foley. It's a digital recording stage where Foley artists and mixers have everything they need to experiment with sound design and to customize effects. A combination of high-tech recording equipment and a Santa's workshop/do-it-yourselfer's garage—this place has to be seen to be believed! Look for more on One Step Up in the September issue of *Mix*. ∎

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Owner Jon Lawry, former member of contemporary Christian rock band Petra and now an established producer and artist on his own, started the studio as an extension of his own home studio; he plans to expand it to three rooms. (The 56-input Raindirk he now uses at home will go into the studio's tracking room, scheduled to open later this year.) Visitors to the new facility have included Allison Krause, Ricky Skaggs, 4 Him, Rebecca St. James and Boy Howdy.

Lawry says he was fastidious about making the new studio commercial, both in terms of its clientele and in terms of zoning. "I think it's important to operate ethically and 'above ground,' so to speak," he says. "But what's happening in Nashville is that the population is increasing, and the traffic's getting worse. So since a lot of the artists are living in this area, it's making more sense for them to have studios to use closer to home." The Border's rates are $1,395 per day, and Lawry says he can be profitable at that price. "One thing about Nashville, everyone's looking at rates first," he says.

Cool Springs Recording was slated to open this month in the Franklin area. General manager Steve Schott says the one-room facility, with a limited-edition custom API Discrete Series console, will likely expand by the end of the year. "We chose this area because we wanted to be able to build a large room from scratch, not something you can do on the Row," he says. "The opportunities are better down here, we think; the people who work in Nashville are living down here, and you can have access to the business in Nashville but have all the amenities of a non-urban location." The studio owner is John Helvering, former artist manager and former owner of Pinebrook Studios in Anderson, Ind.

The first marketing attempt by the **National Association of Professional Recording Services** came with the arrival of Impact, a large annual confab of Rap, Urban and Gospel music business members. The convention was slated for May 1-5 at Opryland, the first time the convention was held outside of its usual site in Atlantic City. NAPRS board member Preston Sullivan of Sixteenth Avenue Sound said NAPRS and the Nashville Entertainment Association, with whom NAPRS is working closely on events like this, became aware of the convention too late to secure a hospitality suite at Opryland, but said they would try to make a showing there in some other way, even if they have to throw a tent up on the lawn. "It's an incredible opportunity to do exactly what our mandate is: Show the rest of the music world what Nashville studios have to offer," he said.

Sullivan cited the fact that Nashville is already the recording home for a lot of black music, including records by Ziggy Marley, Vanessa Williams, Whitney Houston, artists on Atlanta's LaFace Records, and local rap and urban groups like Christian's D.C. Talk. "This is exactly the kind of thing we want to go after," Sullivan said. ■

Dan Daley is Mix's East Coast editor. Fax regional information to him at 615/646-0102 or e-mail danwriter@ aol.com.

Merchant and **Felipe Elgueta**, as well as in SSL 2 with producer **Doug Rasheed** and engineer **Brandon Harris**. The band mixed in SSL 1 with engineer **Mick Guzauski** and assistant **James Saez**, and mixed more in SSL 3 with engineer **Jon Gass** and assistant **Kyle Bess**...Legendary man-in-black **Johnny Cash** is recording his second album for the American label at **NRG** in North Hollywood with producer/label-chief **Rick Rubin**, engineer **Sylvia Massy** and assistant **Lisa Lewis**... **Cherokee**'s (L.A.) Studio 1 hosted Virgin Records band **Cellophane**, tracking on the custom board with producer **Howard Benson**, engineer **Bobby Brooks** and assistant **Devin Foutz**. Working on the studio's Trident A were **Robb** brothers **Dee**, **Bruce** and **Joe** producing and engineering Japanese pop punkers **Shonen Knife** for MCA. **Josh Achziger** and **Mike Gibson** assisted...Continuing mixing in Studio A at Burbank's **Encore Studios** were **Tom Lord-Alge** and assistant **Mauricio Iragorri**. Projects included **Kenny Wayne Shepard** live for Revolution, **Chalk Farm** for Columbia and **Star 69** for Radioactive...Producers **Charles Jordan II**, **Carl Roland** and **Al Flouse** (collectively known as Mo' Kutz Productions) and engineer **Rob Chiarelli** mixed MJJ/Sony recording artist **Brownstone**'s *Don't Sleep* at **Ameraycan Studios** in North Hollywood. **Ross Donaldson** assisted...**The Plimsouls** tracked their new release in Studio C at Hollywood's **Paramount Recording** with engineer **Barry Conley**, while in studio A, MCA R&B act **Immature** tracked and mixed their latest with producer **Chris Stokes**, engineer **Claudio Cueni** and assistant **Susan Herndon**... **Peter White** was in **Alpha Studios** in Burbank mixing his next project with producer/engineer **Paul Brown** and second **Charles Nasser**...

NORTHEAST

Since **The Ramones** broke up, they've been busier than ever. The band was in New York's **Baby Monster Studios** mixing a live record documenting their last show (recorded by **Ed Stasium**). **Daniel Rey** produced the album, working with engineer **Ian Bryan**. The band also re-recorded their cover of the classic "California Sun" for a Surfrider Foundation compilation...Trumpet virtuoso **Tom Browne** recorded his second album for Hip Bop Records at New York's **Sear Sound** with producers **Bob Belden** and **Milan Simich**. The album features Larry Goldings on keys, bassist Ron Carter, drummer Idris Muhammad and saxophonist Javon Jackson...The **Mighty Mighty Bosstones** (who appeared in a scene from the movie) recorded songs for the TV-show version of *Clueless* at **Normandy Sound**, Warren, RI, with engineer **Phil Greene** and assistant **Robert Pemberton**...**dbs digital** in Hoboken, NJ, recently completed several projects on their Sonic Solutions system, including **Chris Butler**'s solo venture on Future Fossil Records and **The Tadpoles** *Far Out* LP for Bakery Records...At **Sound Techniques** in Boston, **Cherry 2000** recorded and mixed an upcoming single with producer/engineer **David Porter** and assistants **Stuart Sinclair** and **Scott Robertson**...Alternative folksters **Cobblestone** worked on their forthcoming 22 Records release at **Cotton Hill Studios** (Albany, NY) with producer **Sandy McKnight** and engineer **Robert Turchick**...Reprise act **Love in Reverse** completed their new *I Was Here* LP at **Pie Studios** in Glen Cove, NY, with producer **Russ Titleman** and engineer **Dave O'Donnell**. **Giovanni** was also in with producer **Richard Gottehrer** and engineer **Jeffrey Lesser** recording and mixing for his upcoming Elektra release...

sound pressure level in the room that is not assaulting, where the audience shies away from the screen. This crew is trying to be very preservative and very conscious of levels, of not reaching the point where OSHA is saying, 'Guys, you are too loud.' This crew, and the crew that Kevin works with—and there are very few teams out there who think this way—are very conscious of not hurting the audience. There's no need for it. We can make apparent loudness without shredding someone's ears with digital sound."

"The way you do that is by lowering what's in front of the shock event rather than making the shock event so loud," explains O'Connell."

"We're trying to preserve the audience's ears," adds Landaker. "We want to involve them, but we don't want to hurt them."

"I'm going to go out on a limb here and say the responsibility of the level on the dubbing stage begins with the mixer," Maslow says. "Everybody tells you it's the director who's forcing you to make it louder, or an editor who's making it loud. But in the end, it's you who has a finger on the console."

To be sure, there seems to be a backlash in Hollywood and across the country about films being too loud, both in the sense that dialog can be buried (the ultimate sin, according to most editors and mixers) and ears can ring. There are loud moments in *Twister*, but as Landaker says, its *apparent* loudness, grip-your-seat loudness, not an assault. Critics may pan the script, but audiences are guaranteed a ride—a true audio-visual roller-coaster. ∎

Tom Kenny is a Mix *associate editor.*

CREATIVE CAFE

Stephen Hunter Flick left Weddington Productions and his longtime partners in the late-summer of 1995 to open Creative Cafe with his wife, Judee. After brief stops in the Varitel building, then Director's Sound, they purchased 6,000 square feet on Glendale Boulevard South in Los Angeles. On October 6, 1995, the day they moved in, they began cutting.

The space is light, open and airy, with a '50s diner decor. The first thing you notice on entering is a working 1946 jukebox that plays 78s. The reception area is dominated by the front end of the cherry-red killer car from *Christine*, which has been made into a desk. Diner-style chairs and cafe flooring add to the charm. There is a gym downstairs for editors to keep fit. An onsite chef cooks breakfast and lunch for the staff. A healthy crew is a happy crew.

The main room consists of compartmentalized cubicles for the assistants. Each station has been designed and optimized for specific tasks, with the appropriate computer horsepower—one station for Exabyte backup, another for printing log sheets, etc. Editing/design rooms surround the central floor, with an additional four design rooms and a transfer room downstairs. All in all, there are 30 edit bays.

Creative Cafe is a Pro Tools/Avid house. On the day I visited, they were evaluating Pro Tools 3.21 from Digidesign, and the Avid Media Dock system had arrived in crates. Tour guide and sound supervisor Dean Beville, who serves as de facto system supervisor at Creative Cafe, says the plan is to convert the entire in-house DAT library to sound files that will reside in Media Dock, providing instant access to any station.

But many are in a position to buy equipment and, with the proper financing, open a shop. It's the people that make Creative Cafe, and it's the crew that the Flicks most like to talk about. So, for *Twister*, here is that crew:

Supervising Sound Editor: Stephen Hunter Flick
Sound FX Editors: Warren Hamilton Jr., Gregory Hedgepath, Richard King, Charles Ewing Smith, Marvin Walowitz, Teresa Eckton
ADR Supervisor: Judee Flick
ADR Editors: Beth Bergeron, Nicholas "Von Loopen" Korda

ADR Mixer: Bob Deschaine
ADR Recordist: Tami Treadwell
Dialog Editors: Rick Freeman, Stephanie Flack, Ben Wilkins
Foley Editors: Solange S. Schwalbe, Charles Maynes, David Spence
Foley Artists: John Roesch, Hilda Hodges
Foley Mixer: Mary Jo Lang
Foley Recordist: Carolyn Tapp
1st Assistant Sound Editor: Linda Yeaney
Sound Assistants: Catherine Calleson, Baylis Glascock, Jeff Etcher, Don Likowitz, Chris Smith
Special Sound Design and Field Recording: John Pospisil, Ken J. Johnson, Eric Potter, Charles Maynes, Martin Lopez
Recording Assistant: Mollie Gordon
Sound Transfer: Matthew Beville, Eddie Bydalek
Temp FX Editor: Bruce Stubblefield
Temp FX Assistant: Dana Gustafson
Trailer Editor: Paul Berolzheimer
Interns: Bill Wagner, Stephen Rafferty

AND OUTSIDE OF CREATIVE CAFE:
Re-Recording Mixers: Steve Maslow, Gregg Landaker, Kevin O'Connell
Music By: Mark Mancina
Score Engineered By: Shawn Murphy
Score Mixed By: Steve Kempster
Music Editor: Zig Gron
Assistant Music Editor: Rupert Nadeau
Executive Music Producer: Budd Carr

Quad Studios

1802 Grand Ave.
Nashville, TN 37212
(615) 321-4067; Fax (615) 321-0046

From Neil Young to Amy Grant, Quad Studios has maintained its legendary status. Our four-studio facility consists of two tracking rooms with vintage Neve and Trident consoles, both with flying fader automation. In addition, we also have two overdub rooms. Full-time on-staff techs provide excellent service for our clients, who enjoy working in the heart of Nashville's music industry.

Rockingchair Recording Studios

1711 Paplar Ave., Memphis, TN 38104
(901) 276-8542; Fax (901) 276-8546
e-mail: rknchair@vdaspk.cam
http://www.vdaspk.cam/rknchair

Rockingchair Recording Studios, located in the heart of midtown, adds to Memphis' rich musical heritage. Offering a relaxed and creative ambience, state-of-the-art equipment and an advanced staff, Rockingchair is the perfect retreat for today's recording artist. Our philosophy is simply this: An easygoing atmosphere allows for the best performance and maximum productivity. Established in 1989, the new facility went online December 1993 with two independent studios and an expanded equipment list.

Sound Kitchen

112 Seaboard Lane
Franklin, TN 37064
(615) 370-5773; Fax (615) 370-1712

The Sound Kitchen arrived in Nashville in 1994 and has become a first-call studio for producers and engineers nationwide. This 6,500-sq.-ft. dedicated multimedia recording facility is located in the Cool Springs area of Franklin (ten short minutes from Music Row). A Neve VR 72 legend, a Neve V3 60 Legend and a Sony 48-track digital tape deck are the cornerstones of these superbly equipped studios.

The Castle Recording Studios Inc.

1393 Old Hillsbora Rd.
Franklin, TN 37069
(615) 791-0810; Fax (615) 791-1324

Originally built as a hideout and bootlegging site by Chicago mob boss Al Capone, The Castle Recording Studio rests upon 34 forested acres only 15 minutes south of Music Row. Much of the building's character was incorporated into the studio's design, including hardwood floors and windows in almost every room. The Castle attracts a wide variety of clients, including John Hiatt, Steven Curtis Chapman, Pray for Rain, Alan Jackson and BR5-49.

Recording Arts

307 29th Avenue North
Nashville, TN 37212
(615) 321-5479; Fax (615) 321-0756

Internationally recognized, Recording Arts has been the recipient of multiple Platinum and Gold records in the 11-year history of this beautifully comfortable studio. Featured is the brand-new SSL 4000G+ with Ultimation, ASC design control room, NHT SW3 subwoofer system, Bryston amplification, and a great selection of vintage and new outboard gear. The client list includes Mutt Lange, Bill Schnee, Roger Nichols, Val Garay, George Massenburg, Claudio Cueni and John Jaszcz.

Caravell Recording Studios

2361 Fall Creek Rd.
Bransan, MO 65616
(417) 334-7040; Fax (417) 334-2014

Located in the heartland of America, designed and operated by artists for artists. Three recording rooms include a Euphonix console with 56 channels of automation; Trident 80-B Console; Sony/MCI 24-track analog tape machines; 48 tracks of Alesis digital ADAT machines; Sony PCM 7030 timecode DAT machine; Pro Tools digital audio workstations; and a vast array of world-class microphones and monitors.

Sound Emporium

3100 Belmont Blvd.
Nashville, TN 37212
(615) 383-1982; Fax (615) 383-1919

The entire Sound Emporium facility was designed around the idea of client comfort which includes a full kitchen, conference room and a full-service staff. The studio features a Neve 8128 console with Necam 96 automation, Trident 80-B console, Mitsubishi X850, Otari MTR 90II & III audio recorders and a formula 8 Cue System. Recent clients include Trisha Yearwood, Pam Tillis, Ricky Skaggs, Twila Paris and Yo Yo Ma. For more information please contact Melissa Brannan.

MasterMix

1808 Division Street
Nashville, TN 37203
(615) 321-5970; Fax (615) 321-0764

Located near Nashville's Music Row, MasterMix has been providing mastering and editing services for over 13 years. MasterMix blends experienced talent with a variety of classic analog and the latest digital equipment. We strive to offer the client the widest range of choices in high-quality listening environments. Our equipment list is always expanding, so call for the latest details.

Revolution Sound

809 18th Ave. South
Nashville, TN 37203
Phone (615) 329-1111

Our 24- & 32- track facility is located in the heart of Nashville's Music Row. While our client list includes some of country music's biggest names, Revolution Sound is *the* studio in Nashville where cutting edge music is created. We were formed to offer an alternative to the norm. We are different and our philosophy is..."If you're not recording on the edge, you're taking up too much space!" Contact Rodney Good or Steve Ledet.

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Ad Index & Reader Service Page

—FROM PAGE 28, THE NEW ALCHEMISTS

signal you want to work with (if not every *piece* of audio), is still an integral part of the process. And even on the fastest computers, like Pentiums and Power PCs, these processes are s-l-o-w-w-w. About the best ratio of processing time to file length I've seen is 15 to 1. Of course, you never get it right the first time, so in real-world terms, you'll have to at least double or quadruple that.

There's also a problem, sort of a basic philosophical flaw, in the concept of imposing expressiveness—whether it's time-, pitch- or level-based—onto an audio track after it's been recorded. In MIDI sequencing this is done all the time, but to my ears (and this is something I try constantly to beat into my students' heads), an artificially expression-enhanced MIDI track is far inferior to one that was played expressively in the first place. When the basic track is audio, that problem multiplies. For a performance to be expressive, there must be audible feedback to the player—singers or instrumentalists who can't hear themselves can't make those instantaneous micro-decisions that determine how to impose their will on the instrument physically, and make the changes in the sound that we recognize as expression. This feedback loop is crucial, and it works even if it's highly convoluted: A church organist playing pipes 50 yards away can, once she gets used to the delay, be just as expressive on her instrument as someone playing a set of tablas in her lap. Interrupt that loop, and the performance suffers greatly. If you would like to see a pianist have a nervous breakdown, make him play an electronic keyboard in which the attack times of the notes are varied, very slightly, at random.

When the loop is eliminated completely, performance parameters are in danger of losing all of their meaning. Do too much to the parameters, and they will sever any relationship they had to the original track. Reapply them to the original, and they will be irrelevant. Instead of a real performance, you'll end up with a stilted track that's neither fish nor fowl.

But before you go away thinking that I consider all this stuff worthless, let me say that the idea of putting a MIDI front end onto a pitch-shifting algorithm is fascinating. You can use it to bring new levels of complexity and immediacy to sound editing. For example, if you have a sampled sound effect that you want to make into a musical instrument (a popular technique in commercial production these days), you could put it into a sampler and play it from a sequencer, but each note will have different timbral, loop and vibrato characteristics, and when you go more than a certain direction up or down, you will invoke the dreaded munchkin effect. If, on the other hand, a pitch-shifting template based on a MIDI sequence, complete with volume and pitch-bend information, is laid on the sound, the timbral qualities don't change in the same ways, and the effect can be, the result can still be ghastly, but we're talking sound effects here, not the New York Philharmonic.

And there's nothing wrong with taking an audio track of a funky rhythm section, or even a piece of *The Rite of Spring*, and imposing a hip hop tempo map over it, if that's going to make your day. I doubt anyone will worry about whether it's being true to Stravinsky. When the quest for new sounds is more important than the need to preserve the fidelity of the original material, this kind of processing can be great fun. Just don't try to make "Yellow Submarine" fit the beat of a Ramones track. There's way too much to lose there (and you'll probably get sued).

So enjoy the dog-and-pony shows, and think about how AMAC can work for you—in your fantasies and in reality. It won't change your life, but once it settles down, and if you have some patience, it will add some neat tricks to your production arsenal.

• • •

I saw the movie *Mr. Holland's Opus* the other night, and it will probably be out on video by the time you read this. See it. The dialog is creaky, you can see the plot developments coming a mile away, you'll want to scream, "Stop whining and get a MIDI setup!" at Richard Dreyfuss' frustrated-composer character, and the music (by Michael Kamen, who should know better) is drivel. But the point the film makes, that music transforms and inspires people in an infinite variety of ways, is of the highest importance to all of us. And it expresses beautifully the fact that snatching music away from schoolchildren in phony austerity moves is shameful and ultimately self-defeating. As the title character says, "You can teach them reading and writing, but without the arts, what are they going to write about?" ∎

Paul D. Lehrman writes at his original pitch and tempo.

I said, "Play what back?" He said, "What we just did." I said, "You didn't start the tape recorder." [Laughs]

What about studio design through the '50s and '60s?

Hall: [The dead sound] is what they were going for. Instead of natural acoustics, they just started dabbing things down with carpet on the walls, which I never did think was the right thing to do. I built the original Music Mill. We did the first Alabama records there, which turned out to be pretty good. I don't think anybody here as a whole knew acoustics that well. There was some knowledge, but I know the guys from New York would come down or they would call. I was sort of an outsider, so they'd call me wanting to know this. I know when RCA Studio A put that carpet everywhere and they called me about it, I said that was a bad situation.

Snoddy: I think this "dead sound" happened by accident, to be quite honest about it. I know the original Castle Studio was simply two hotel rooms with a little glass window in between. The room itself was a pretty live room. It just so happened that I think the acoustics in there were compatible with what they were doing. The records turned out to sound really good. A lot of that was simply trying it—if it doesn't work, you change something until you get it to where it does sound good. That was even true in the Quonset Hut. A lot of things were tried over there originally, and finally Owen decided he'd build a separate little booth for the drums and the bass and kind of get them away from the vocals and the rest of the instruments. It worked. That was a very innovative thing that he did in those days.

Sparkman: When Columbia built the big Studio A up there [now Javelina], that was probably the first studio in Nashville that had an acoustic-engineered design. And it was the worst studio. They paid some acoustic engineer out on the coast. The thing about it was this man was accustomed to engineering concert halls. The idea in a concert hall is that you want to hear the sound in the back of the room as well as you want to hear it up in the front. And that's the way he built this studio. And that's not the way a studio should be built. You'd drop a nickel on one end and it would sound like World War III on the other end.

Lockert: The echo chamber at the

Quonset Hut, though, is what got the Nashville sound started. They had an echo chamber that nobody could copy. And they came down from New York and everywhere else to listen to the echo chamber. You'd take them and show them where the echo chamber was, and they couldn't believe it. Mort and Owen took a closet and a toilet in the back of that basement, partitioned it off. They went in there and coated that with about 15 coats of shellac. There was a wood folding chair in there, and I think a 639 mic sitting in there. There was an Ampex amplifier with tone control so you could change the tone of the echo chamber. That sat right in the middle. Nobody could go up and down the steps to the office during the session if you were using the echo because it would go into the echo chamber. And you couldn't flush the toilet

Bragg: That was probably preceded by dropping those mics down the stairwell at National Life. The studio was on the fifth floor of WSM. I don't know [who it was] decided that if we could get a little reverb going, mix it in a little bit. So one of them decided, well, we'll drop a mic down the stairwell. There was a stairwell right outside the studio. Five floors, and there were elevators on each side on each floor, and the walls were hard. You could get a semblance of reverb by dropping that mic down there and feeding it on into a spare input on the

console.

Snoddy: There was one big hit record to come out of that studio at WSM, and that was "Near You" by Francis Craig. That record was a big hit record and later on was the theme song for Milton Berle.

Mack, you founded Masterfonics. When did mastering become an issue in Nashville?

Evans: Till 1972, discs would go straight to [the Columbia pressing plant at] Terre Haute. Plating and pressing up were done there. I guess the first mastering in this town was Mort [Thomason]'s old Presto lathe. He had it at Bradley's in the Quonset Hut. Bill Conner had the lathe down on Broad. Mort had the one at Bradley's. Disc mastering lathes. CBS and RCA both had Scully systems in-house.

Sparkman: Most of those masters, there was nothing much done to it. Because something could happen to it en route or whatever, you tried to get your mix and your sound and EQ and whatever you wanted onto your master tape. There were some that were done where you played with the tape between the tape and the disc, but the sensible way to do it was to get your tape right and then go straight on to disc.

Evans: In the late '60s, I was working at Music City Recorders, and they had an old Neumann lathe with an Audiophone cutting system. We were doing the recording for Sound Stage 7

> # IF SOMEBODY TODAY BLOWS A GUITAR STRING, WE HAVE TO OVERDUB OR RECUT. BACK THEN, A LITTLE FRET NOISE ON THE NECK OR A LITTLE AMBIENCE OFF HERE SOMEPLACE OFTEN MADE THE RECORD.
> ## —CHARLIE BRAGG

Records, which was the R&B division of Monument Records. Basically, Scotty would hand me the tape and say, "Go make it good." You then were effectively making changes from the original mix. We had equalizers and limiting compressors. Basically, that was all, but we also had cut-off filters to limit the range on disc cutting. The scourge of disc cutting is heavy bass, because it took up so much space on the disc. So if you had something that had a heavy bass sound to it, you would try to pull your cut-off filter up to a point where you were decreasing the lowest tone or the lowest frequency, but not damaging significantly the sound of that bass instrument. What we were trying to do was get away from any possible rumble or anything else that was recorded on that tape because that would create a waste of space on the disc. Just the whole concept of mastering is get as much level as possible within the constraints of time. You can only put so much level for a given amount of time until then, you start limiting and EQ'ing to try to squeeze a little more on.

CBS is the one that started true mastering here in Nashville, to the best of my knowledge, in the manner of cutting lacquers for a major record company. When CBS bought out Owen, they moved in lathes; at first it was mono, and almost immediately it was stereo. They had a tie-in with the Scully company where they used Scully lathes they had modified for variable pitch and variable depth of recording. The idea that CBS tried to get across was that if you did what you were supposed to do in the studio, when you got it sounding right, then we'll bring it to the mastering room and we'll make a 1-to-1 transfer. The idea was to make that record sound exactly like the tape. So if you could achieve that, theoretically, you would have always the same-sounding record. That's theoretically. In practice, it didn't work out too well.

Are you guys listening to country radio today?
Evans: They all sound alike.
Lockert: There's some feeling in modern country, but it's a different kind of feeling than what was going on when we were doing it. The problem is that all the artists sound alike. They seem

to copy one another. Tell me where a Lefty Frizzell is today?
What made his records different?
Lockert: His sound—not the studio sound—is what made it different.
Bragg: If somebody today blows a guitar string, the producer would automatically have a fit, and we'd have to overdub or recut. Back then, a little fret noise on the neck or a little ambience off here someplace often made the record. Nine times out of ten, they'd ask you how you felt about it, and if everybody was in agreement, cut that jewel out and send it off. Records today are absolutely perfect. Today they compile vocals, they'll take a piece here and a piece there, even if the guy couldn't sing it that way all the way through to save his soul. But on record it's perfect. I think there's a big difference in a perfect record and a record that's got some feel to it. Some of the records we made by necessity sounded more like the onstage performances than today's records do.
Sparkman: Let me tell you something: We used to have a lot of fun. We didn't make a lot of money but we had a lot of fun. ∎

FIELD TEST

EQ for the monitor section, so you don't have to worry about splitting the main channel EQ. I also liked having both Mute and Solo switches in the monitor section. Using its Merge button feature, you can treat the monitor section as an independent submixer or merge it with the L/R mix. Having the peak LEDs near the channel faders makes them very easy to see.

The studio and control room monitoring sections are flexible, with provisions for playback of two tape machines without repatching. If you have near-field and main speakers, the two sets of speaker outputs allow you to switch easily between them. Combine this with a flexible talkback section, separate headphone level control, extensive group assignment capability, and a master Solo LED with level control, and you have a potent set of features that make the Project 8 an excellent mixer for any project studio.

The Project 8 sounds fabulous. From the moment I first heard it, I was impressed by its sound quality. Even with the EQ set flat, I liked what the Project

8 did to the sound. With virtually any signal that I tried with it, the Project 8 imparted a very pleasing, slightly "compressed," yet natural sound. It tended to make all my mixes sound like a "record," even with the EQ set flat. So yes, the Project 8 does have a distinct tonal quality, but I like it. I felt it improved the sound of my recordings and mixes.

Another major plus for this board is its so-called "British EQ." Soundtracs has a winner with the EQ used on the Project 8. I can't say enough good things about it. The lows were tight without being boomy. The highs were crisp and airy, yet not shrill. The two mid-bands were well-defined without being muddy or harsh. In a word, the Project 8 equalization is musical. And you get six bands of it! The EQ is a standout in this fine-sounding mixer.

The Project 8's mic preamps were very quiet. I used them with dynamic and condenser mics, and I was perfectly satisfied with them for a mixer in this price range.

The Project 8 also has plenty of headroom. I could always get ample gain for any signal I fed to the Project 8, yet I never encountered any distortion

problems. The board is very quiet and is particularly well-suited for digital recordings. However, there was one slight problem. The peak LEDs on each channel tend to light at too low a level (that is, even though the peak LED was lit, I could still increase the gain quite a bit without hearing any distortion). The manual states that the peak LEDs should light 5 dB before clipping, but in fact they light at a much lower level. For example, when recording kick drum, the peak LED would be continuously lit, yet no clipping was present.

ERGONOMICS
The Project 8 is attractive and well-laid-out, with overall good construction. The board is raised in the rear and slopes down toward you, making most of the channel legends visible while providing adequate space to operate the controls. All the buttons on the board snap into place with a reassuring click and the height of the buttons makes it easy to determine whether a button is up or down. One nice touch is that all Solo and Mute buttons light up when depressed. The actual buttons themselves light up, making it very easy to see exactly what has been pressed.

FIELD TEST

I also liked the feel of the faders. They were smooth, but not too loose-feeling. However, there are no rubber coverings in the fader wells. Soundtracs said this was a design decision—if the rubber warps, it could interfere with the fader's travel. The knobs feel a bit flimsy, and sometimes it was difficult to find the center detents.

Also, I would have liked the metering to have better resolution. I found the meters to be a bit finicky at times. When setting levels, I would be at -3 dB, and just a slight increase in the level would light the 0dB LED and would cause the +3 and +6 LEDs to flash on peaks. I also had a slight problem with my meter bridge, but Soundtracs assured me that the problem would be corrected when the final units shipped. I have now verified that the units that I have seen in stores have had the problem corrected. All in all, the Project 8 has a good look and feel for a mixer in this price range.

I have a few minor complaints about the Project 8. First, there is no built-in talkback mic. Second, there is no Solo In Place. Third, you can only assign the effects returns to their local groups. Fourth, the +4/-10 settings for the tape ins and outs can only be changed internally. But these are minor problems, and you can work around them. However, I did find the Aux Send section to be somewhat limiting.

As I mentioned, there is a dedicated channel cue send and a dedicated monitor cue send. But only two (out of four) post-fader effects sends are usable at one time. And if you assign one of these to the Monitor section, you only have one post-fader send for the channel during mixdown. With the low cost of today's effects units, I think that many people have more than two effects units available at mixdown, yet Project 8 only provides two simultaneous post-fader sends. I think a minimum of four post-fader sends should be available at mixdown for a board in this price range.

However, Soundtracs says that future Project 8s will be designed with internal links, configurable to use Aux 1 and 2 as pre- or post-fader sends, although Aux 2 will still be devoted to the monitor. And further, they will be set from the factory as post-fader sends. So according to Soundtracs, future Project 8 units will have 4 post-fader sends, with one dedicated to the channel, one dedicated to the monitor, and two that can be individually split between the

channel and the monitor, and the first two can be internally configured as pre-fader sends. But changing the default settings will involve disassembling the Project 8 and either cutting or soldering the links. Other than the limited number of post-fader sends, I found the Project 8 to be a very well-thought-out board with a host of useful features.

The manual is relatively thick, but about half of it contains parts lists and schematics. Some of the information in the feature section is sketchy. For instance, the entire description of the phase button states, "The phase button reverses the phase of the input signal to cancel out-of-phase conditions." But no information is given as to when the input signal might be out of phase and why you would want to cancel out of phase conditions. I realize the manual is not intended to be a primer on multitrack recording, but since the Project 8 is marketed toward the project studio market, more thorough descriptions are warranted, and a tutorial would be a nice addition. However, the manual has excellent sections on the principles of sound recording and hooking up, and technical information, as well as a helpful block diagram.

HOME STRETCH

The bottom line is that the Soundtracs Topaz Project 8 sounds great, has a good feature set, is attractive, ergonomic and well-built, offering an optional meter bridge and VCA fader/mute automation, all at a very attractive price. But how attractive? U.S. retail pricing is as follows: 24-channel Project 8: $3,995; 32-channel Project 8: $4,995. I would recommend the Topaz Project 8 to anyone interested in a solid analog 8-bus in-line recording mixer. If you're looking for an alternative to the Mackie 8-Bus series of mixers, the Topaz Project 8 may be just the ticket.

(Special thanks to Danil Dreger, the manager of the Queens, NY, Sam Ash store, for loaning me power cables when my review unit arrived with cables, but no plugs.)

Soundtracs, Unit 21-D, Blenheim Rd., Longmead Industrial Estate, Epsom, Surrey KT19 9XN UK; phone: 44/181/388-5000; fax: 44/181/388-5050. ∎

Dominick J. Fontana, an attorney in New York City, is the owner of Studio di Fontana, a multitrack/MIDI recording studio. He is also a Sysop in the CompuServe MIDI/Music Forum. His e-mail address is 74766.2154@compuserve.com.

—FROM PAGE 21, THE GOOD, THE BAD & THE UGLY of which converters you do use; the bad is that the whole master word clocking issue is still kind of a mess. This means that when you need to simultaneously use multiple converters for such outrageous deviant behavior as multitracking, you might find that systems that claim to deal with this either don't, or do it poorly, with jitter and other clock troubles.

The other audible problem is DSP code quality. As you search and shop

> **A good system is so fast and powerful that it takes you past its learning cycle, past the reasons you bought it (increased productivity and versatility), all the way to a new plane: creativity.**

your way into this wonderful world, listen, too. See if the EQs are useful or just abuseful. Check to be sure that gain changes, fades, pitch changes and any other DSP sounds like you want it to. Remember, if you don't like it, they will fix it. They have to.

THE UGLY

Well, most of you know that one of my companies designs workstations. Those who didn't do now. I have very strong beliefs concerning what they should look like, how they should work—and why. I have tried many design concepts and have, of course, done sessions on every DAW system that I could get my hands on. I am a working producer and engineer, so I have a real-world history to draw on.

With that established, I must say that some of these DAW's interfaces are butt-ugly! Damn! What is the deal here? It seems that like so many other things in life, DAWs started out with a linear distribution of ugly, poorly thought out, nonintuitive interfaces, then better ones, still better, nice ones, and clever, well-planned, beautiful ones. Then, as time

went on, it's as if all the designs were thrown in a centrifuge and spun to either extreme. There is nothing left in the middle, no "kind of nice," no "pretty good." Now it seems there is only good or bad.

I am very pleased to say that finally, in this last season's offerings, there are some very nice interfaces. It's almost getting to the point where there is a good one for every bad one. While the bad ones show that the company could not possibly have a single real working musician or engineer on staff, the good ones show that their company's goal is to make a real working tool. They obviously have staff who care about this industry, and they probably tried countless interfaces in the real world.

And while the bad ones make that artistic statement, "I don't know about art, but I know how to ship fast," the good ones are solid, physical, tasteful and inherently usable. Unfortunately, these typically ship a little later. Just the field testing alone can take a year or more!

Ah, but the results. Some of the new systems out there are stunning. There are finally some people who care *and* understand what an interface must be to be useful.

SO...

So if you have tried a DAW in the past few years, you might want to take another look this year. They have grown up. The computers, their memory and the large drives needed for audio have all become much faster and less expensive, so buying a home for your new DAW is not the shock it was just last year. Every DAW I design is better than the one before, and the same goes for most of the other designers. Strangely, only the ugly ones stay the same.

The converter problem just takes a bit of planning to overcome; there is a lot of pressure for improvements there, and it is starting to show. It's all falling rapidly into place, with one exception: the control surface. Yes, this is a call to arms (again). If you go to the trouble to rally and demand good control surfaces, you will get them— from me and the others. And your DAW just might thank you by changing, before your very eyes, from interesting to incredible. ∎

SSC wants you to demand good control surfaces so that he can have one for his own studio. He can't do it all alone (actually, sometimes he says he can, but then he gets better).
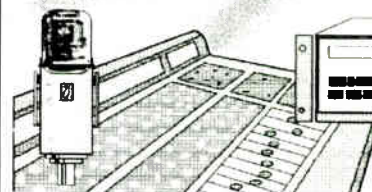
Studios, which he says is quite a bargain. "It goes out for about half the price of most London studios," he says, "because it's a control room and a studio. It has one loo, it has an electric toaster, a microwave, and that's it." As for the equipment, Raezor has an SSL 4000 E console, with a G Series computer, a Studer A820 tape machine, JBL main monitors and, as at RAK, NS-10s powered by Quad 520s. Brown has developed his own way of using all of the studio's speakers to full advantage. "We all know that NS-10s don't supply great information at the low end," he says, "so what I did one day is I linked up the two monitor systems, and I let the bottom end of the JBLs bleed into the room a little bit. Now, if I were to sit you down in front of the console with both sets of monitors running, you wouldn't be aware that the JBLs were actually running. You'd just think, 'God, these NS-10s sound good.' Record companies love it. They go, 'That Steve Brown gets a really ridiculously good sound out of his NS-10s,' but I've got the JBLs bleeding into the room as well, which supply very high end and very low end, which gives me good information."

Though the recording process was a

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highly collaborative effort, Brown says he and his assistant, Steve Musters, have little use for bandmembers during the mix. "They place the record in your hands, and that's it," Brown says. "I believe all bands should do that. Otherwise, what's the point in paying somebody to mix their record? I prefer to do five or six mixes and then get the band down to listen, and then they can spend half a day listening, and they can give me written notes as to what they think. Then, if I've got the inclination and the time, I'll go back and do a recall and fix what they hear. But generally, I like to get the work done and under way and get stuff out to the record company and get a buzz going, and when you've got a big band like The Pogues, they've all got different opinions; it's as well not to have them all there. I don't mix by committee.

"It was such a straight-ahead album to make," Brown says. "And may I say they were very professional—to a point. They'd get to about the ten-hour stage and then a few beers would start flying around. They'd think, well, we've done a day's work. Let's have a bit of fun. It's important for it to be fun. I'd work them pretty hard for days, and then I'd gauge how much they were enjoying it, and if it was beginning to look like work, I'd just throw a party in the studio. On Saturday evening, regularly, we got together and got down, as they say—played the tracks loud, smoked some joints, drank some beer and basically had fun." ∎

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miked with 57s on the snare top and bottom, an RE20 on kick, 421s on toms and 451s on overheads.

The next stop, with DA-88 in tow, was Austin's The Woodshed to record another married couple: Peter Holsapple (mandolin and backing vocal) and Susan Cowsill (backing vocal). The pair sang into a C-12 reissue, sent through a Focusrite preamp onto the Tascam machine. "We found that people we recorded were really relaxed and comfortable because they only drove 15 minutes to the sessions," says Pete Kennedy. "they were just kind of hanging out at their local studio. We were the ones who were doing all the traveling." When they returned to the East Coast, The Kennedys went to Bias Recorders in Springfield, Va., to triple the male vocal part with John Gorka.

"So at this point, we had almost all the ingredients of the song," Pete

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Kennedy explains. "And we had a demo guitar solo on there, too. We knew that The Byrds had done this song called 'She Don't Care About Time,' the B side to 'Turn, Turn, Turn,' back in 1965, with Roger McGuinn playing 'Jesu, Joy of Man's Desiring' on his 12-string. We had decided to use that as the solo for this song, too, so we got this brainstorm that maybe he would be willing to play the solo.

"We got in touch with his manager, and sent the demo and a little cover letter just saying, 'We know that you played this melody back in 1965 on a song. It's in our song, too. Would you be willing to come in and do it. We'll go wherever you are.' About a month went by, and we were at a truckstop in Montana. We checked our messages, and lo and behold, it was his management saying, 'Roger likes the song a lot, and he's willing to do it.' I don't know what the truckers thought—obvious East-Coast people jumping up and down at a truck stop saying 'Roger McGuinn! Roger McGuinn!'"

The Kennedys recorded McGuinn's solo at Full Sail (Winter Park, Fla.). "He came over with his Rickenbacker," Pete recalls, "and tuned it by ear. A lot of people are afraid to try to tune a 12-string at all. And in a few seconds he had it tuned, and he started playing along with the track. He plugged in direct. He told us he played direct on almost all The Byrds' stuff. And he said his favorite sound with the Rick' was with real heavy compression. In fact, on his current Rickenbacker, he has compression built into it, and we used that. He went over his part a couple of times and did it perfectly. Then we went back and doubled it so we could split it into stereo."

Pete Kennedy says that for most of the parts of this song they used Time-Line Lynx timecode, but a few things they just synched by ear. "Life Is Large," as well as the rest of the album's 12 tracks, was produced by Pete Kennedy and mixed by Jim Robeson on one of the custom API consoles at Bias Recorders—after Maura Kennedy and engineer Heidi Gerber spent several days flying all of the DA-88 tracks back onto 2-inch.

"The DA-88s made the whole concept possible," Pete says. "The masters for the whole album fit in a briefcase, along with a couple of sandwiches and a bunch of paperwork. So it was possible for us to go wherever our guest musicians were, and that helped with the whole feel of the album." ∎

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is, though. I think the whole computer thing can tend to get boring to people real fast."

Loeb, who uses the Net to research equipment purchases and conduct day-to-day business, has high expectations; hence, his demand that the site look sharper than anything else out there. "I won't put it out unless it's absolutely over the edge," he says. "That's the audience you're going for with a Website. It's a particular clientele that finds you that way, not everyone." Greene Street's new Website, which Loeb said he hopes will be ready sometime this summer, will incorporate greetings from staff engineers, who will offer visitors the chance to hear work they've done. "It's a chance to have prospective clients meet the staff," he says. "It's a chance to avert any intimidation people might feel coming to a new facility."

Both Pilot's and Greene Street's original sites were done by Johnny Ricco, owner of Media Streams (www.realitys-fx.com), a site builder who's done sites for several studio clients in Manhattan. Ricco says studios are similar to other Website clients in that they want to show a facility or product to its best advantage in what is still a two-dimensional medium. "The key thing to know

is that the graphics on the site are only going to be as good as what they give me," he says. "I tell clients to make sure they have all their materials together before they come to someone to build a site, and have at least a general idea of how you want visitors to manipulate their way through the site. It makes the whole process go faster." Ricco says his fees for Website construction have ranged between $500 and $4,000, depending on the site's complexity and degree of interactivity. The monthly maintenance fees range from $50 to several hundred dollars, depending on the amount of storage required.

Ricco's studio business has come from word of mouth within the community thus far, and that's also been the main way in which studio owners have found site builders. Loeb of Greene Street says the proliferation of Websites could lead to site builders getting their own representation, which he said would make life a lot easier for studios looking to set their facilities apart on the Web. "You want to find someone who'll make yours look unlike all the rest," Loeb says. "People tire quickly of sites on the Net. You have to maintain it and change it constantly. But I'd like to see groups of designers represented by groups like the old Hypgnosis,

which represented album art designers years ago. It would also help stabilize the pricing of Websites, I think. Pricing is kind of ridiculous right now; you can pay $1,000 or you can pay $15,000. But Websites are definitely revolutionizing everything. How effective it really ends up being remains to be seen. But for now, I think you've got to have one."

Bits & Pieces...**ARcoustics** has been named the design company for two new area studios: The renovation of jazz guitarist **George Benson**'s home studio in New Jersey and the acoustical and architectural renovation of Studio Nine at **Howard Schwartz Recording**, bringing the room up to the specs of staff mixer Roy Latham.

Chung King closed its original location on Centre Street in late April. The former facility was kept open for a year as owner John King opened his new Varick Street location in stages. The new facility has all three studios—two with Neve VR72 consoles and one with an SSL G Plus—up and running. The name will change to incorporate the Varick Street Studios moniker and separate the identity of a new post-production business King is planning. The studio will also house Genius Audio Products, King's new pro audio equipment marketing venture. ∎

NORTHWEST

C&W artist **John Casey Pearson** has been working on his self-produced debut at **Triad Studios** in Redmond, WA, with co-producer **Michael Majerus**. **Peter Doolan** was also in recording songs with **Tom Hall**... American Records' honcho **Rick Rubin** recently hired **Norm Kerner**, San Francisco record producer and owner of the city's **Brilliant Studios** (riding high after the success of his production *The Blue Moods of Spain*) to produce two new signings, **Stiffs Inc.** and **Crown Heights**, both from New York...

NORTH CENTRAL

At Chicago's **Sparrow Sound Design**, **The Mighty Blue Kings** recorded their new R-Jay Records release, *Meet Me in Uptown*, with engineers **Patrick Halliwell**, **Wally Herson** and **Sparrow**. Halliwell also engineered for percussionist/poet **Don Moye**, who was in tracking his *Afrikan Song* release for the

Aeco/Southport label...Ex-Black Sabbath warhorse **Geezer Butler** recorded a track for an upcoming TVT release with his new band **G/Z/R** at **WarZone Recorders** (Chicago), with producer

Martin Atkins and engineers **Van Christie** and **Jason McNinch**. Atkins also remixed a track for TVT artists **Gravity Kills** to be included on a new single. ∎

At Warehouse West in Vancouver, B.C., assistant Jeff Dawson (L) and producer/engineer Futcher look on as assistant Darren Grahn and engineer GGGarth work the faders at mixing sessions for the band Ten Days Late. The project was tracked at Bryan Adams' personal studio, also in Vancouver.

FEEDBACK

WHAT'S ROUND ON THE ENDS AND HI IN THE MIDDLE?

How *dare* you publish an article on Ohio's studios (May '96) and overlook its biggest city? I am one of Columbus' busiest independent audio engineers and have been receiving *Mix* since 1979, when it was just a newspaper. We are home to more major corporations than Cleveland and Cincy put together. Columbus has five acts signed to major labels and twice that on independent labels. I recorded over 400 commercials and four CDs last year alone, so don't say we have nothing to offer. I work in no fewer than six hard disk studios, including a brand-new 32-track Pro Tools III room, and our analog and ADAT rooms are second to none.

Some of these studios are Amerisound (a new facility), Diamond Mine (featuring the new Otari console), John Schwab Recording (another new facility), and Mus-I-Col Studios (where I was head engineer for 10 years), which has one of the largest collection of vintage Neumann tube mics and other vintage gear in the country. Hell, even the vintage Wally Heider tube board that Steve Barncard refers to in his Grateful Dead article in the May issue is alive and well at Mus-I-Col. So if you really want to know what's goin' on in the "new" digital world, ask someone from a market like this, where engineers must be versed in all current formats.

Douglas Edwards
Columbus, Ohio

THE HEADPHONES OF OZ

Regarding your "Field Test" in the May 1996 issue of the Audio-Technica Studiophones: I work as an engineer and tech-in-training at an analog 24-track studio. We recently purchased three pairs of the new Audio-Technica ATH-D40 phones to replace some of our old reliable Fostex T-20s. Mr. Petersen is right about them being particularly good for bassists and drummers, but he overlooked one very important fact. These headphones cannot take a beating and keep on ticking. I don't know what they were thinking over at Audio-Technica when they put plastic plug bodies on the ¼-inch connectors and

built the other end of the cable into the earpiece. All three plugs are now cracked and at least one pair has a shorted cord that will have to be completely replaced. One thing I loved about the Fostex 'phones was that parts could be swapped between pairs. Granted they don't sound as good, but working headphones are better than broken ones any day!

Michael Rippe
Oz Studios
Baltimore, Md.

GOSPEL MESSENGERS

I would just like to thank Dan Daley for his recent coverage of Charlie Peacock and John Elefante. Given that the Christian music industry is larger than one might think, it is important to talk with producers in the field. Also, it might be important to recognize that the ultimate aim is not making $$, but to give us an avenue to reach people with the message of salvation through Jesus Christ.

Mr. Daley, keep up the good work. And might I suggest interviews with other CC producers such as Brown Bannister (Amy Grant) and Steve Taylor (Guardian, Newsboys)?

Eugene Fok
bs252@freenet.toronto.on.ca

AUDIO BOTANY 101

I am dismayed at the lack of educational support by the audio industry ("Insider Audio," April '96). JBL et al are quick to throw money into the MTV advertising ring ("Mass Marketing Pro Audio," April '96), yet are skinflints when dealing with their best future customers. "Those crummy, tire-kicking students" may be cash-poor at the moment, but have great future buying potential.

Seeds sown early make hardy plants. Thirty-some years ago, I was impressed with a mail-order catalog called Allied Radio, which turned into Radio Shack, where I still turn to for basic electronic parts. In the last year, I've spent 10 Gs on audio gear. Investment in today's students will pay dividends from tomorrow's consumers.

Herb Cronin
Harrisburg, Pa.

YAHOO! SURF'S UP!

I've got a good solution for Stephen St.Croix's problem with "file crosstalk" ("The Fast Lane," April '96)—forget all that encryption stuff (one might view audio jargon as a form of encryption anyway), get off of AOL and get a real ISP! Fifteen seconds with Yahoo! and you'll find half a dozen ISP's in any city in tiny Maryland.

AOL has the unique practice of picking your attachments off of your mail *for you*, which a regular ISP doesn't do. If you encrypt your attachment, it doesn't diminish it's ability to get lost by AOL. And it doesn't diminish the likelihood of your getting someone else's JPEGs. Imagine mailing your column to *Mix* just before the deadline [*Hah!* — *eds.*] and having it get lost while you're out tooling around on your Harley—probably worse than getting a picture of some naked lady.

Mark Lindahl
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JUST SAY NO TO HIGH SPLS

Thank you to Paul Lehrman for the "What Happened to the FOH Mix" article ("Insider Audio," May '96). Live sound is a very difficult job, as we who do it know. We wrestle with a hundred impediments to really good sound ranging from guitarists a half-step flat to "musicians" who want the bass in all the monitors, then complain because they can't hear the voices. Yet, if we are proud of what we do and who we are, we wrestle with obstacles until the show sounds as good as we can make it. Lehrman didn't, however, raise the issue of excessive SPLs at so many shows, and I think that this is a factor in many "bad sound" experiences. Let's raise the standard, folks, before the lawyers decide we are a ripe target and the audience has finally had enough.

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