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*- Francis Buckley, Independent Engineer,  
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*"It's nice to see a company interested in the user's input before they release a product. They developed a reverb that really works. It's easy to make these kind of programs run if you've got tons of hardware. How they did it with such a small box at such an affordable cost is really impressive. It was worth the wait."*

*- Charlie Brewer, Chief Engineer,  
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*- Jay Graydon, 2 Time Grammy Winner,  
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PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

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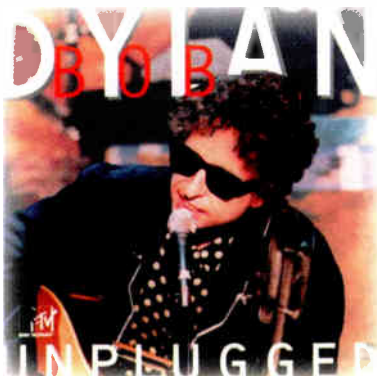
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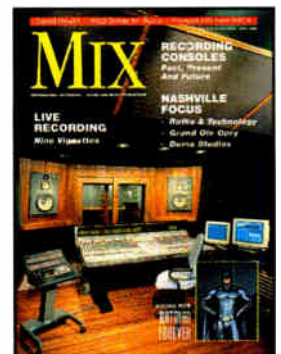


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The Work Station in Nashville features a fully automated 64-input Harrison Series 12 console. The studio, designed by Marty Williams, also features main monitors by KRK and Sony 3348 and Mitsubishi X-850 digital multitracks. Other gear includes a Pro Tools III system, Lexicon D-Verb and Nu-Verb effects processing, and Waves 1-10 and L-1 mastering software. Studio construction was by Mike Cronin. **Photo:** Steve Roberts.



# How to Succeed with a Sonic

## Edit and mix

Analog or digital in — Grammy out! It's no coincidence that the majority of the 300 plus recordings nominated for 1995 Grammys were edited on Sonic systems.

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## Cut radio programs

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NoNOISE<sup>®</sup> is used around the world to tackle the problems of tape hiss and ambient noise, clicks and pops, and distortion and crackle. Engineers, artists, and producers wouldn't trust their masters with anything less.

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Beatles Live at the BBC editing, NoNOISE, and premastering by Peter Mew, Abbey Road



SONIC SOLUTIONS



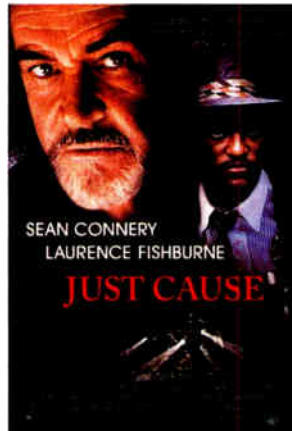
# a Grammy® winner

Our precision editing, high-resolution recording (all Sonic systems support 24-bit data), and superb sound quality yield stunning results and kudos all around.

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For multimedia pioneers, handling hundreds of soundfiles is all in a day's work for the Sonic. And with a native AIFF file format and OMFI compatibility, the Sonic is the CD-ROM producer's choice.

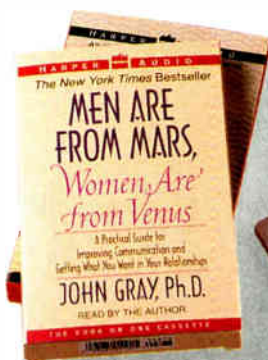
## without a reel to reel



Tune in to ABC Radio, the BBC, the CBC, CBS, Danish Radi., Dutch Radio, KCRW, KIIS, NPR, Premiere Radio, WDR (Germany), WETA, WGBH, and dozens of others

## for a platinum release

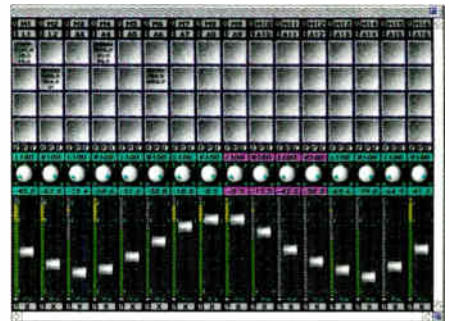
## on tape



Men are from Mars, Women are from Venus prepared at Harper Audio

### The Ultimate in Power: USP

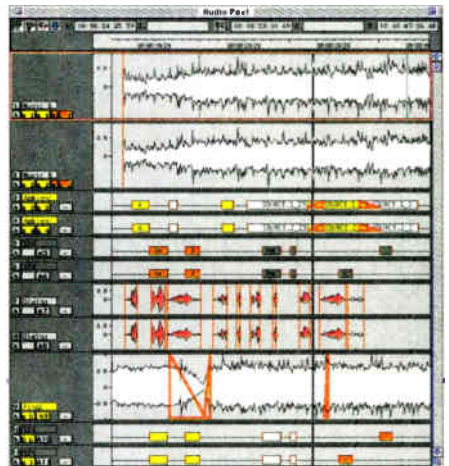
The USP (UltraSonic Processor) puts more digital signal processing power in the hands of audio professionals than any other Mac or PC-based audio workstation.



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# FROM THE EDITOR

## The Song's the Thing

*Question:* What do you get when you play a country song backward?

*Answer:* You get your woman back, you get your truck back, you get your dog back, and you wake up sober.

Certainly, such clichés don't apply to all country music, and there's no denying the fact that country music is hot. Very hot. While Nashville may be referred to as Music City USA or the Country Music Capital of the World, it is arguably also the songwriting center of the universe. Long before the 1950s, country singers, songwriters and producers from around the world began seeking fame and fortune along Music Row.

No matter how wonderful the technology or recording medium, the creation of quality music still relies on The Song. As fans of technology, it's too easy for the producing or engineering community to ignore this most basic musical commodity. As a test, randomly select any ten albums or CDs from your music collection. Most of them probably contain one or two strong songs, accompanied by weaker material. And if we re-examine those tunes that have affected us most in life—whether by Carl Perkins, Sam Cooke, Smokey Robinson, The Beatles or Hank Williams—chances are that we're attracted to the songs' emotional impact, rather than a killer snare sound.

Ironically, we spend countless hours in the studio, perfecting the sound or performance, while the time devoted to selecting material is often a fraction of that amount. In far too many instances, the artist, wanting all the songwriting revenues from an album, refuses to consider outside material. Even more disturbing are cases where the producers or artists accept an outside song, but only if they are listed as co-authors.

Yet somehow, new songwriters can—and do—succeed in the face of such adversities, pouring their lives and souls into creating great songs. And as the music industry convenes in Nashville for the Summer NAMM show from July 14 to 16, this might be an appropriate time to reflect on the contributions that great songwriters everywhere have given to us all.

It would be a drab world without them.



In this issue: Nashville remains one of the few areas on this planet with a demo studio market, and in "Project View," *Mix's* East Coast editor, Dan Daley, reports on this thriving industry. Also in keeping with the Nashville focus, we take a look at the new sound system at the Grand Ole Opry and investigate how technology is affecting studio rates in Music City USA.



George Petersen  
Editor



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The screenshot shows a professional DAW interface. At the top, there are timecode displays for different tracks: 01:00:20.00, 01:00:25.00, 01:00:30.00, 01:00:35.00, and 01:00:40.00. The interface includes several tracks with waveforms, including a track labeled 'drums-03'. On the right side, there is a mixer section with faders and buttons for 'voice 1', 'voice 2', 'voice 3'. Above the mixer, there are various processing modules, including a compressor with settings for threshold (-30.0 dB), ratio (2.50:1), attack (27 msec), and release (291 msec). There are also EQ sections with frequency sliders. The bottom right corner of the screenshot shows the 'digidesign' logo.

This screenshot shows a multi-channel audio interface control panel. It features a grid of level meters for 8 input channels and 8 output channels. The meters are labeled 'INPUT' and 'OUTPUT' at the top. Below the meters, there are various control elements like 'voice 1', 'voice 2', 'voice 3' buttons, and 'solo', 'mute', 'rec', 'auto' indicators. The interface is densely packed with controls and displays, typical of a high-end audio workstation. The 'digidesign' logo is visible in the bottom right corner.

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# CURRENT

## **YAMAHA PURSUES ESS SUIT**

Yamaha Corp. of Japan announced that it will seek review of the denial of its motion for a preliminary injunction against ESS Technology Inc. issued by a Los Angeles federal court. Yamaha sought the preliminary injunction based on its assertion that ESS's ES1488 chips infringe on two Yamaha patents covering FM sound synthesis. FM sound synthesis is widely used in multimedia computer systems to generate high-quality PC sound.

The order denying the preliminary injunction request was filed under seal by the court, and its terms could not be disclosed. Yamaha explained that the order only denied the preliminary relief sought by the company and that Yamaha will continue to pursue its claims against ESS in order to obtain a permanent injunction. Yamaha also stated that it was confident that the order denying the injunction would be overturned on further review.

Yamaha filed an action last year against four sound board distributors involving the same patents at issue in the current dispute. In that case, the court granted Yamaha's request for a preliminary injunction.

## **PALMER RESIGNS, BARR IN AS ALESIS PRESIDENT**

Russell Palmer resigned as president of Alesis Corporation, and CEO Keith Barr has taken over Palmer's duties. Barr, the major stockholder and past president of Alesis, founded the company in 1985. Barr's principal contribution to the company has been in product development, but he is equally interested in marketing strategy.

"Despite Russell's departure, we do not expect any major changes to our support of distribution or to our product line," Barr said. "Through

coordinated efforts of a strong management team, we expect the transition to be smooth and uneventful."

## **TERRY IS NEW JBL PRO PRESIDENT**

Mark B. Terry was promoted to president of JBL Professional in Northridge, Calif. Terry brings 17 years of pro audio industry experience to his new position, including more than a decade in sales and marketing management. Most recently, he served as executive vice president for sales and marketing for JBL Professional, directing the company's international division. Terry succeeds former JBL president Ronald Means.

## **STUDIO SUPPLY TO CONTINUE**

Refuting rumors of its demise, president John Alderson of Nashville's Studio Supply said the company will continue in operation under the direction of longtime employee Terry Palmer. Palmer is negotiating to purchase the business, which will relocate.

Alderson, meanwhile, is entering into an arrangement with William J. Ray & Associates, an Atlanta-based rep firm that handles Otari products. Alderson will open an office in July in Cummins Station in Nashville as an Otari rep. Studio Supply will also become the authorized repair and maintenance supplier for Otari products in Nashville. It already handles that function for Digidesign.

"This is not in response to the fact that MI suppliers in Nashville have added pro audio products to their lines," said Alderson, who has owned Studio Supply for 11 years. "It's simply a matter of timing. My lease was coming due in June, and I had been planning some changes for a while. I simply couldn't talk

about them until now, and in the meantime, rumors began to circulate."

## **CLAIR BROTHERS EUROPE FORMED**

In the most recent step in an ongoing global expansion, sound reinforcement company Clair Brothers Audio Enterprises Inc. (headquartered in Manheim, Pa.) recently merged with five-year business partner Audio Rent B-AG of Basel, Switzerland, to form Audio Rent/Clair Brothers Europe.

Clair Brothers has been involved in a growth spurt over the past six years, building partnerships and entering into mergers worldwide. In 1989 it formed Clair Brothers Audio Japan in Tokyo, then Clair Brothers Mexico in 1991. In the fall of 1993, Jands Production Services of Sydney, Australia (a 15-year business partner of Clair Brothers), was updated and expanded and helped form Clair Brothers Singapore to service the Pacific Rim.

With these expansions, Clair is aiming to provide system continuity for worldwide touring projects. Each affiliate has standard Clair Brothers inventories, offering tours the chance to minimize freight between regions.

## **DESPER AWARDED SPATIALIZER PATENT**

Desper Products Inc. (Woodland Hills, Calif.), the operating subsidiary of Spatializer Audio Laboratories Inc., was granted a U.S. patent for its Spatializer 3-D audio signal processing technology. The patent, comprising 40 claims, covers both the Spatializer core circuitry as well as the Double Detect and Protect dynamic control structure.

"The patent conclusively estab-

—CONTINUED ON PAGE 16



now!  
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As every performer knows, there are plenty of good musical instruments. But a truly great one is rare indeed. More than mathematically calculated pieces of wood and strings. Such an instrument becomes one with the artist. You know what we mean. So why are we bringing it up? Because now there's a unique piece of electronics that's making performers, producers and engineers feel that very special way. It's the Eventide DSP4000 Ultra-Harmonizer<sup>®</sup> brand effects processor.

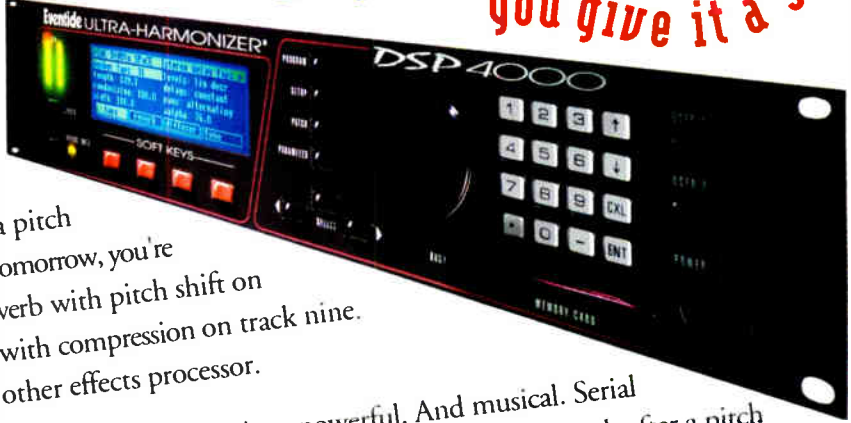
Unlike conventional effects boxes that come with a handful of algorithms and some predefined presets, the DSP4000 puts the basic building blocks of effects into your hands: over 90 *effects modules* such as pitch shifters, delays, filters and EQ's. The DSP4000 links these effects modules in different ways to give you over 200 programs right out of the box. But that's just the beginning. You can work with the machine to create your own unique "effects signatures." Top industry names are already writing new effects for the DSP4000. The number of different effects the DSP4000 can deliver is almost infinite.

We gave it a brain,  
you give it a soul.

That flexibility is another key to the collaboration that the DSP4000 forms with its owner. The DSP4000 works like you do. Today you're tracking—the DSP4000 is a pitch corrector and subtle de-tuner. Tomorrow, you're mixing—the DSP4000 is a reverb with pitch shift on track one, a parametric EQ with compression on track nine. Try doing all that with any other effects processor.

You *can* do it all with a DSP4000 because it's so powerful. And musical. Serial multi-effects do not compromise individual effect quality. So you can add reverb after a pitch shifter without degrading the quality of either effect. Effects quality is always superb; audio quality is completely transparent. The DSP4000 is an outstanding reverb, a brilliant effects box, and it's simply the best pitch shifter that ever was. But like any great instrument, the whole of the DSP4000 is greater than the sum of its parts.

And that's what elevates this unit above the competition. In the rack, it's a one-of-a-kind effects processor. But in the right hands, it becomes a *creativity* processor. It's well worth a few hours of your time to get your hands on a DSP4000. Get a full demo and see why creative people are finding the Eventide DSP4000 inspirational.



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Balanced mic and unbalanced line inputs with phantom power and 20dB pad accommodate the widest range of input signals.

The only console in this price range with true Split EQ, each assignable to monitor or channel. High-frequency shelving control at 12 kHz, low frequency at 80 Hz for smoother, more musical EQ results.

Dual sweepable mids on each channel let you apply 16dB of boost or cut at critical frequencies.

Setting up two independent stereo cue mixes is no problem. Try this with other mixers in this price range, it just won't happen or you'll have to compromise something.

The most versatile AUX section in its class; rivaling expensive high-end consoles. 8 sends total, 2 in stereo. Send signal in stereo or mono, pre- or post-fader. Available all at once. Return signal through any of 6 stereo paths.

Direct channel input switching. Assign to one of eight busses, or direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching. You won't find this kind of speed or flexibility in a "one-size-fits-all" board.

Feel those 100mm faders! Turn those smooth and responsive knobs! They feel and work better than any other in its class. The M-2600's physical design takes the aggravation out of recording and lets you focus on the process of creating music. Everything is 'right where it ought to be'. Try it for yourself.

Each M-2600 channel features advanced-design mic pre-amps with incredibly low-distortion specs. Plus you get phantom power on each channel. Feed anything into the M-2600 from condenser microphones to line input from synths and sound modules.

For your personal or project studio, don't settle for anything less than a dedicated recording console. Some may try to convince you that a "multi-purpose mixer" works fine for multitrack recording. But don't take their word for it. The compromises, hassles and workarounds just aren't worth it.

Want proof? Ask your salesman how a multipurpose mixer handles these common recording situations. But listen carefully for workarounds, repatching schemes and other compromises. Then compare it to how easily the M-2600, a true recording console, sets up and does things.

**SITUATION** Separate headphone mixes for the talent and the producer. The talent wants a reverb-wet mix, but the producer wants it dry. Everyone wants it in stereo.

**Compromise:** Multi-purpose mixers require you to sacrifice 4 AUX sends and tape returns to get 2 stereo headphone mixes; but you need those sends/returns for outboard effects! What a dilemma.

**M-2600 Solution:** With a few buttons, assign up to two, independent stereo AUXs to be used as headphone mixes. Everyone hears the mix they want — and you've still got four AUX sends and returns free for signal processing gear.

**SITUATION** You're EQing tape tracks to get just the right sound. You're using the shelving EQ for the monitor mix, and the sweepable mids for the channel buss. Still, the drummer wants a certain frequency out of his mix — a job for the sweepable mids.

**Compromise:** Few multi-purpose mixers have EQ assignment. You're stuck with the shelving EQ on the monitor mix, and the sweepable mids on the channels (if they even have split EQ). You've got no choice. Good luck trying to explain this to the drummer.

**M-2600 Solution:** Assign the shelving EQ, the sweepable EQ, or both to either the monitor or channel buss as necessary. The entire EQ section is splittable and assignable and can work in tandem.

**SITUATION** Mixdown. You're sending tracks to effects units for added studio polish. You want to take advantage of true stereo effects. How do you do it?

**Compromise:** Most multi-purpose mixers have fewer AUX sends than the M-2600's eight. Usually only in mono. And, some sends are linked, so you can't send them to different signal paths. So you settle for only a few effects, or forego stereo effects altogether.

**M-2600 Solution:** Pick one: 8 mono sends or 1 stereo and 6 mono sends or 2 stereo and 4 mono sends. Each with its own level control and separate output jack. So you can use true stereo effects and still have sends left over for effects. Send the effects signals back via 6 stereo returns.

**That's not all!** The M-2600 doesn't compromise sound, either. You'll appreciate the new TASCAM sound — low-noise circuitry and Absolute Sound Transparency™. It all adds up to the perfect console for any personal or project studio — combining great sound with recording-specific features you'll need when recording, overdubbing and mixing down. Features you can get your hands on for as little as \$2,999 (suggested retail price for the 16-input model).

So forget compromises. Invest in a true recording console. The TASCAM M-2600.



Available with 16, 24 or 32 inputs, the M-2600 is optimized for digital recording. Don't wait till your first session to discover the compromises and hassles other boards will put you through.





# DING, MOST OTHER CONSOLES OMPROMISING SITUATION.



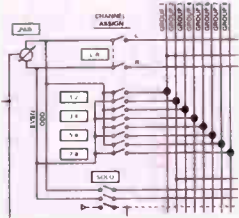
Only the M-2600 provides two independent stereo cue systems. Demanding performers can hear the submix or scratch tracks the way they want, so they'll perform better. Meanwhile, the control room or producer's mix is unaffected. You can accommodate everyone involved in the production — without interrupting the creative flow. Best of all, using the cue mixes doesn't involve tying up your valuable AUX sends.



Use more effects/signal processing gear on more tracks with the M-2600. Use two (count 'em) true stereo send/returns to support stereo effects units. Plus, you still have 4 fully-assignable AUX sends left over for other gear. A total of 8 AUX sends — more than nearly any other console — anywhere. Better yet, you can use them all at once. No compromises. At mixdown, you can actually double your inputs so you can mix in all those virtual tracks. Just press the "Flip" switch. No repatching. No need to buy expensive and space-eating expansion modules.



The incredibly flexible design of the M-2600 means signal routing is versatile and accomplished by the touch of a button, instead of a tangle of wire. Our decades of mixer experience has resulted in an ergonomic design that's exactly what you need: a board that speeds and facilitates recording and mixdown. Everything is where you intuitively think it should be. Dedicated solo and mute indicator lights on every channel, on master AUX sends, stereo returns, and each of the 8 busses so you always know exactly what you're monitoring. Plus, SmartSwitches™ protect you against redundant or canceling operations.



**TASCAM M-2600: THE CONSOLE DESIGNED SPECIFICALLY FOR RECORDING.**

Of course, the M-2600 sounds great. It's got totally redesigned low-noise circuitry, Absolute Sound Transparency™ and tremendous headroom. No coloration and virtually no noise. You will hear the difference. So, even during long mixdown marathons, you'll hear an accurate representation of what's been recorded.



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# INDUSTRY NOTES

Peter Kehoe joined the Northeastern regional sales staff at Euphonix (Studio City, CA)...UK-based A.S. McKay Ltd. appointed Harris Allied as the exclusive U.S. and Canadian distributor of the Oktava line of microphones...Recent hires at IJI Specialty Audio Inc. (Benicia, CA) include Marjori Schmutz as engineering process manager and Matthew Garfein as brand manager for acoustic research. Eric Suh was promoted to brand manager for NHT...Telex Communications Inc. (Minneapolis) recently acquired the wireless video transmitter and receiver business of TransVideo Systems Inc. of San Francisco. James Hurwitz, president of TransVideo, is joining Telex as product manager for the wireless video line. Telex also appointed Southeastern Communications Systems Inc. as its new pro audio rep in North and South Carolina, Georgia, Alabama and Tennessee...QMI (Hopkinton, MA) hired Glen Ilacqua to handle the company's public relations and marketing activities...Electro-Voice (Buchanan, MI) appointed Brian Blackmore as communications director and Frank Walker as technical communicator...Fairlight's London office added Ross Caston and Mark Lawrence as European sales managers...Software company Waves (Knoxville, TN) appointed World Marketing Associates as its sales rep for Europe and the Middle East...ARX Systems opened a service center in Los Angeles, phone (310) 837-1380...Furman Sound Inc. expanded its Greenbrae, CA, facilities and promoted Michelle Voge to credit manager and Paul Kovin to the newly created post of customer service specialist...Crest Audio (Paramus, NJ) hired Allison Dorsey as project engineer for the NexSys engineering group...Gainesville, FL-based Sabine welcomed Frank Bougher to its sales and marketing department. Also, the company was recently issued Australian and Canadian patents. Other international patents are still pending...Audio-Technica U.S. Inc. (Stow, OH) promoted

Michael Edwards to the newly created position of manager, sales engineering...Harry Klane returned to Eastern Acoustic Works (Whitinsville, MA) as national sales manager. Klane originally joined the company 15 years ago as its first employee...SADiE manufacturer Studio Audio & Video (Cambridge, UK) hired Neil Somers and James Gross in customer support and Dr. Mark Easton in R&D...Sony Disc Manufacturing appointed the first senior-level managers at its soon-to-open Springfield, OR, facility, including Mike McVey (director of logistics and systems engineering); Steve Chadbourne (manager of systems engineering); Jeffery L. Schimmer (manager of information systems); Kelly Bretz (accounting manager); and Gary Winburn (purchasing manager)...Kenneth W. Graven was promoted to the position of principal consultant at San Francisco-based acoustics and architectural firm Charles M. Salter Associates...KEF Electronics of America (Holliston, MA) appointed Henry Finke as national sales manager...Timothy S. Hart joined McKay Conant Brook Inc. (Westlake Village, CA) as a senior consultant...DGS Pro-Audio Inc. (Arlington, TX) appointed Yale Electronics as its Southern California distributor...Dolby veteran William Mead was appointed vice president, international business development at Sony Cinema Products Corp. (Culver, City, CA)...ESCAtech media Inc. (Half Moon Bay, CA) added Bill Ford and Pamela Rau to its sales staff...Richter Scale Productions Inc. (Englewood, CO) signed on as a dealer of Apogee Sound speaker systems...Sal Raia was named executive vice president of Fiber Options Inc. (Bohemia, NY)...Ron Lukowski joined the sales team at rep firm Audio Biz Inc. (Wauconda, IL)...Buffalo, NY-based Eastco Pro Audio/Video Corp. appointed Jeremy Flinchbaugh to the position of production specialist, Raphael Wightman to graphics specialist and Peter Van Booven to account executive. ■

—FROM PAGE 12, CURRENT

lishes Spatializer audio processing as the company's exclusive intellectual property," said president and CEO Steven Gershick. "Now, with this key patent in hand, we will be able to rapidly expand our licensee base."

## INDUSTRY VETERANS FORM NEW MARKETING VENTURE

Industry pros Hector Martinez, Rick Clark and Bill Threlkeld formed Triad, a new Fullerton, Calif., company offering marketing services to MI, pro audio and lighting manufacturers in North, Central and South America. Over the years, the partners have worked collectively or individually with companies such as Soundcraft, Fostex, Tascam, Aphex, Mackie and Grass Valley Group. The three most recently worked together as the marketing team for JBL Professional.

## CONFERENCE NEWS

The NAMM pre-show party is set for Thursday, July 13, at 8 p.m. at the Stouffer Hotel and Convention Center in Nashville. The show itself (July 14-16) is expected to draw more than 15,000 attendees. Call (619) 438-8001 for information.

The third annual Detroit Regional Music Conference will be held July 12-15 at Detroit's Atheneum Suite Hotel. Call (313) 963-0325 for more information.

Scheduled for August 30-September 3 at the Sheraton in New Orleans is the third annual Cutting Edge Music Business Conference. The conference will include a variety of seminars and roundtable discussions, in addition to a new works showcase. For more information, call (800) 945-5447.

Coming up October 24-26 is the REPLItech Asia trade show and conference, to be held at Singapore's International Convention and Exposition Centre. The event is co-sponsored by the International Recording Media Association and Tape/Disc Business Magazine. Call (914) 328-9157. ■



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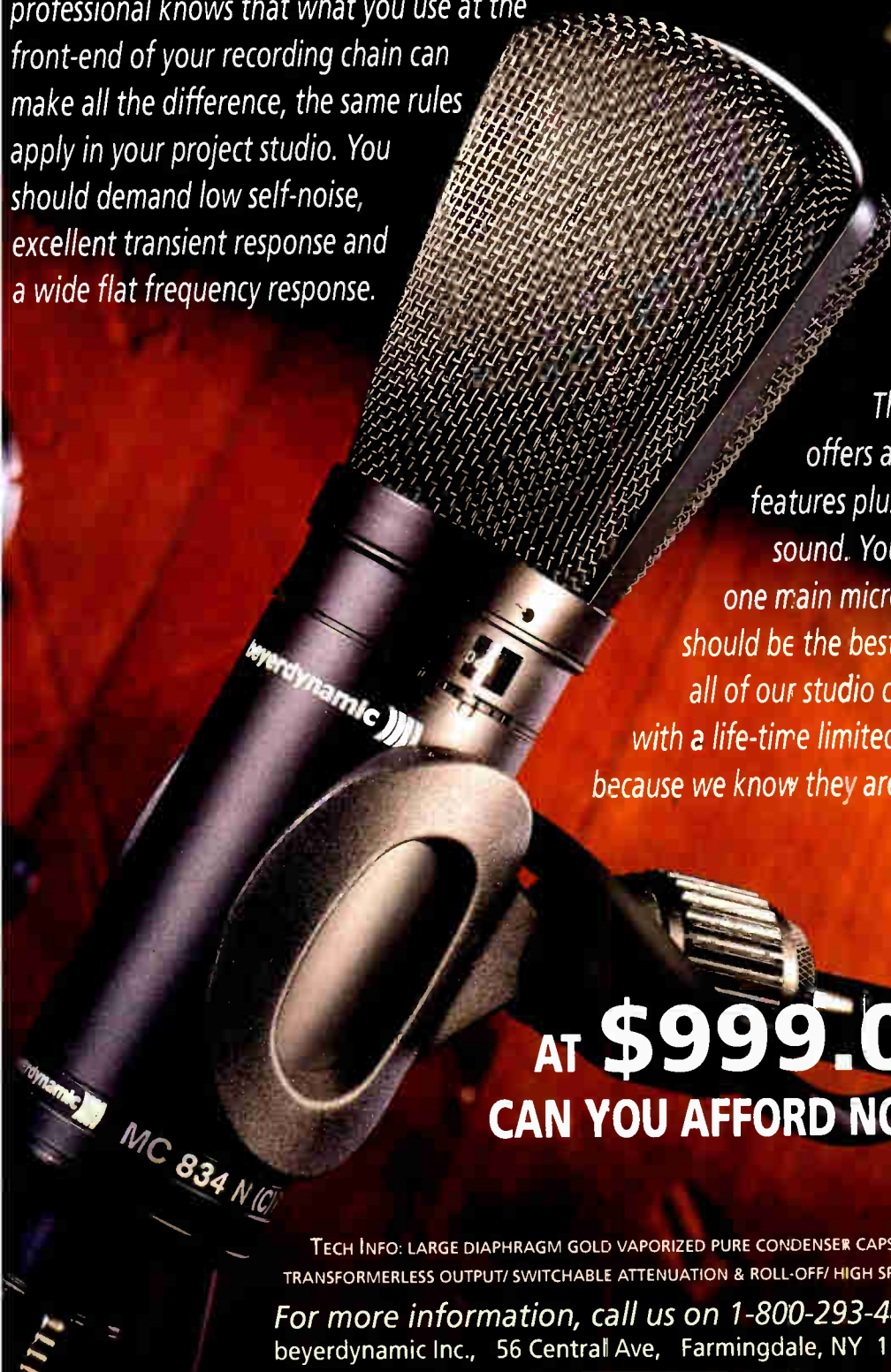
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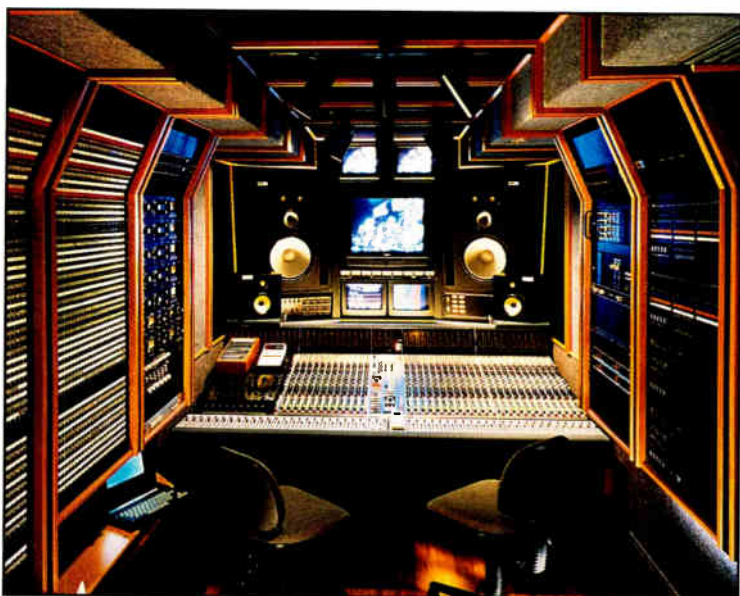
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by Dan Daley

# ROAD WARRIOR: DAVID HEWITT

## A SESSION WITH THE DEAN OF REMOTE RECORDING

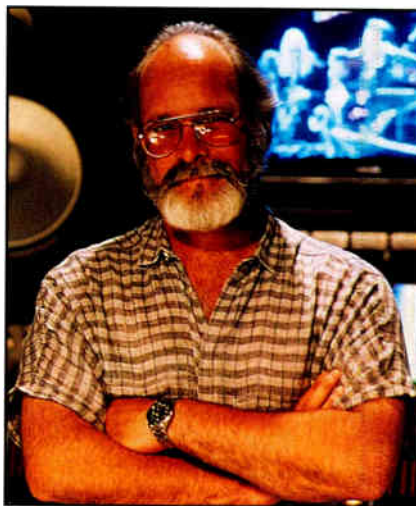


dios can, since, in a way, they are the original project studios, built as much around the owner/operators as the equipment. Hewitt's truck holds a 48-input Neve VR with Flying Faders V.3.0 automation and a Studer 960 Series sidecar mixer. Tape machines include a pair of Studer A820s and two D820 multitracks, two Studer A810 2-track CTTC decks, a Panasonic 3700 DAT and two Nakamichi MR-1 cassette decks. Monitoring is by KRK, with the mains tri-amped with Bryston crossovers.

But for all their capabilities, the trucks often seem as ephemeral as they are mobile; their peripatetic nature gives them less exposure than studios. Yet the remote recording market is integral to pro recording, sometimes evolving on a parallel course and at other times charting its own way. Hewitt talked

**A**t the College of Musical Knowledge, Dave Hewitt has long held tenured status. His Remote Recording Services, based in Lahaska, Pa., began with Hewitt working as the contractor for New York's Record Plant remote systems in the 1970s. Since 1979, RRS has been one of the flagship remote facilities in the professional audio business. Clients over the years have included all the Rolling Stones tours and live recordings for the past 15 years, Pink Floyd, Miles Davis, Frank Zappa, Neil Young, Barbra Streisand, Bob Seger, the Modern Jazz Quartet, Peter Frampton and Aretha Franklin. Beyond records, Hewitt and the RRS truck have done numerous Grammy telecasts, Live Aid, the Tony Awards, the Academy Awards show, Woodstock II and 15 years' worth of "Live From the Met" opera broadcasts for PBS.

It's possible that trucks allow technology to reflect the personal tastes of their owners more than fixed stu-



**Above left:** Remote Recording Services, out of Lahaska, Pa.  
**Left:** David Hewitt

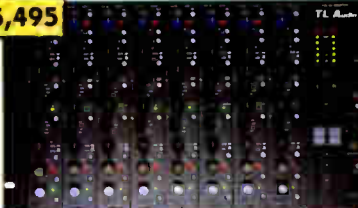


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#### Dual Pentode Tube Pre-amp

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#### TL Audio Tube EQ

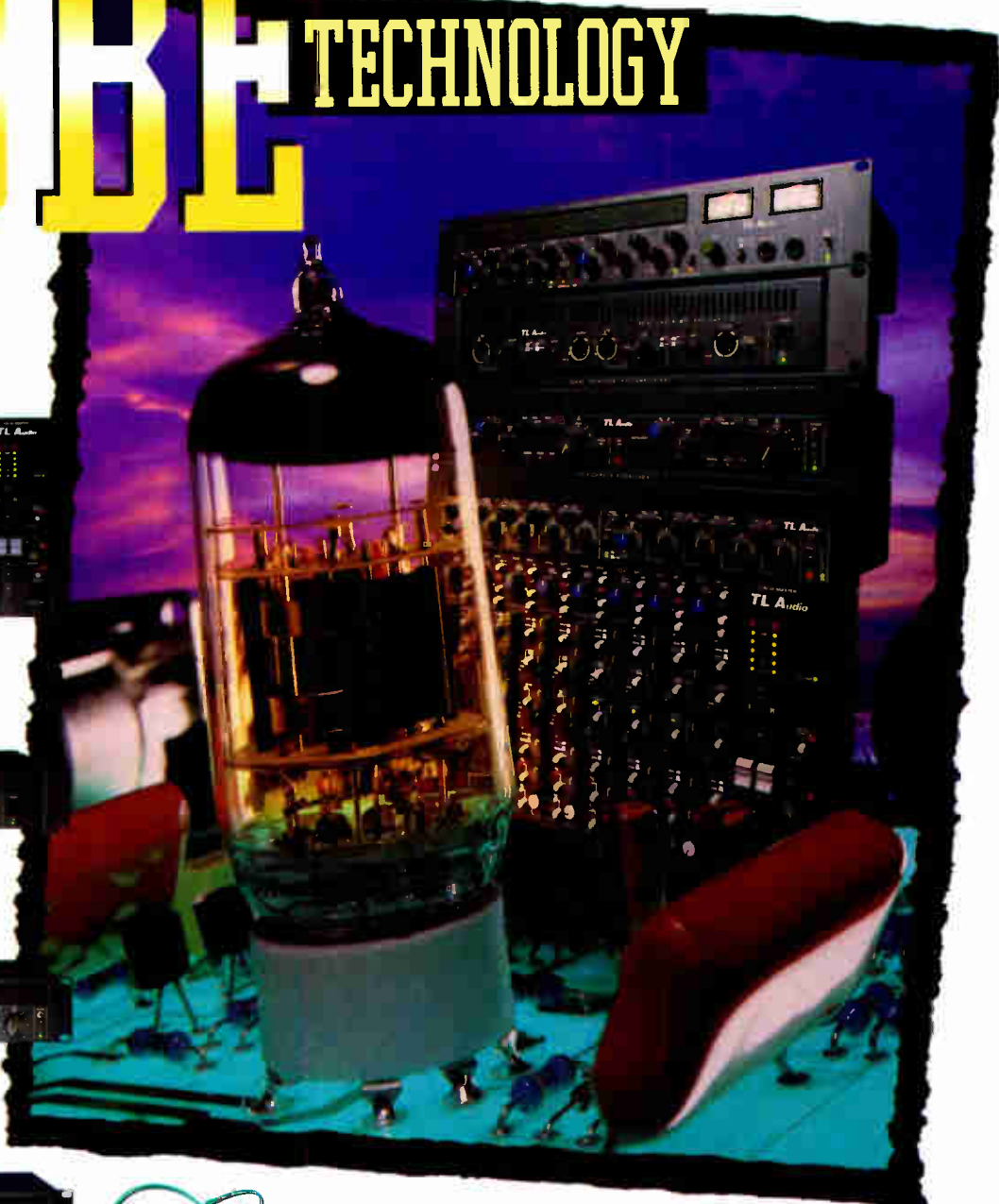
2 channels x 4 band tube EQ, balanced mic & lines, +48v phantom power, front panel AUX input, bypass switch.

\$1,595



#### TL Audio Tube Compressor

Pre-amp tube compressor, balanced mic & line inputs, +48v phantom power, 2 AUX inputs, variable 'soft knee' compression.



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to *Mix* about some of what's gone on and what's to come.

**Mix:** What got you into remote recording in the first place?

**Hewitt:** My first [remote] job was a television pilot I did in Philadelphia in 1970 by pure happenstance. I was working at Regent Sound as a staff engineer, and they called Record Plant in New York, who had just gotten hold of Wally Heider's White truck. That originally had an Italian-built Demideo console; it was 24 by eight, and at the time it was considered big. It had come from the old Johnny Cash television show. Record Plant had put a couple of Ampex MM1000s in it. You want to talk about a crowded truck! A 17-foot box with two of those huge Ampex decks in it. Record Plant did the recording; we were charged with contracting it. But it was exciting doing a remote with a 26-piece orchestra. It made your hair stand up. It struck me that this was the thing I wanted to do.

I went to the coast for a while,

freelancing, and was basically ready to go to work at the new Record Plant in Sausalito. I stopped back in Philadelphia before leaving for what I thought was for good, and I immediately got pulled in by the same guys I worked with on the pilot. There was a vacuum there in remote; there was work but nobody to do it. So I started working for Record Plant in New York with the Heider truck.

**Mix:** Was it an open field back then?

**Hewitt:** Yeah. Engineers didn't so much choose remote work as they were assigned to it.

**Mix:** Were remote projects proliferating as the rock business was growing?

**Hewitt:** There were quite a few things starting to happen in the early '70s. The record business was booming, and live albums were a way to make reasonably priced records.

**Mix:** Has remote recording paralleled the transitions in formats and techniques in fixed recording, or has remote taken its own path?

**Hewitt:** It's a bit of both. It is a specialized set of skills, but the formats are essentially driven by the post-production capabilities of where the project is going to. We eventually

had to upgrade the Demideo console from 8-track to 16-track, in an odd-ball configuration. They ran the machines off the input and brought them back through Ampex AM-10 mixers in groups of four, and bused those down to four individual Altec 604s that were in utility cabinets. So you were actually listening to quad to get 16-track. It was very klugey.

**Mix:** It sounds like remote in the early days was lagging behind fixed installations.

**Hewitt:** It was, because there were so few people doing it, and it was an ancillary thing. It wasn't until 1977 that we were able to get 24-track for the Record Plant remote truck. But by the mid-'70s, that started turning around. There were a few small trucks in those days: Location Recorders and Fedco. They were in the smaller-size category: Two to 24 inputs and 16-track. And interestingly, a lot of those trucks are still around today. In late '78, I put together the Black truck with 24 tracks and a larger API console, and that presaged the modern truck. (That truck was destroyed in a wreck several years later.)

**Mix:** What's been the relationship



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within the remote community between companies? Has it been one of intense competition? Have the trucks felt pressure to play a sort of one-upsmanship game with each other?

**Hewitt:** It's very similar to studios in that sense. My feeling now, perhaps because I'm older and more comfortable, is that people get along better now. It's a much larger business. What's happened in terms of the growth is that the television trucks have sprouted audio capabilities. The biggest mover in that area was Ed Greene [Greene Crowe Truck], who sort of invented television audio as we know it today. He grew the audio capabilities of television trucks from negligible to what we have today

**Mix:** So was that a primary impetus to competition?

**Hewitt:** Absolutely. That was one of the bigger forms of competition for the variety shows and award shows. It forced the dedicated audio trucks to go to larger, contemporary studio-type consoles and larger monitors. There are some limitations in what a TV truck can do—they can't put as large a console in those trucks because they're so overweight already.

**Mix:** So the network trucks started giving competition from above. At the same time, modular digital multi-tracks have made the transition from garage to truck. What place do they have in upper-level trucks like yours, and what kinds of pressure are you and other upper-echelon trucks feeling from smaller, MDM-based remote operations?

**Hewitt:** What happens with the smaller trucks is more a geographical phenomenon. They start by taking up the regional radio broadcasts, and that takes up another niche. The [larger] trucks that are audio-only had to compete for the larger projects. So there is an effect, one that forces trucks upward. It's a matter of geography and size. It all comes down to that. When we built the Silver truck in 1990, we put that into a tractor-trailer and did it on more studio-scale proportions, with a producers' area, for instance.

**Mix:** That was before the advent of MDMs on a significant scale. So smaller trucks affect the larger ones on a regional basis, but let me put it this way: Does a guy with an ADAT and a converted bread truck pose a

threat to trucks on your level?

**Hewitt:** I don't think so. At least I don't feel it. We're dealing with upper-echelon producers who don't use a bread truck and an ADAT because they don't have to. What I see is that when the ADATs and DA-88s are coming in our direction, they're coming into our trucks. We use them as adjunct decks, such as for click tracks and cues, and as augmenting tracks for audience tracks. But again, it's driven by what the post-production needs are, and those are still upper-end as well. For instance, we just finished the Jimmy Page/Robert Plant tour, where all of a sudden in the middle of the tour they had to deliver four sides to England for a television obligation. You think they're going to put that stuff on ADATs when they have to mix the stuff in one day and then fly it to London? I don't think so. They need to be able to go into a major studio with a format that a major studio can deal with. And now it's usually 48-track digital.

**Mix:** How has your current technology mix changed and in response to what? Have clients been requesting

—CONTINUED ON PAGE 215



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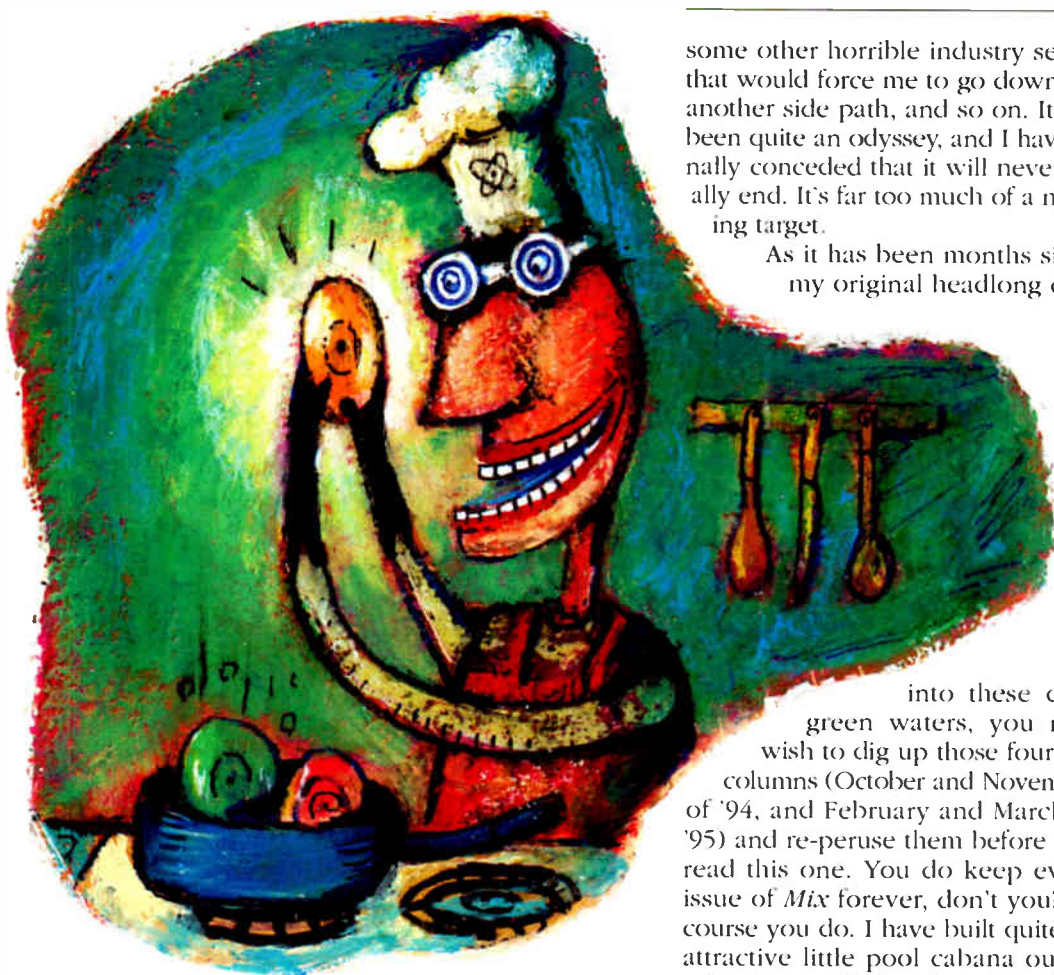
by Stephen St.Croix

# AND NOW, THE REST OF THE STORY

## WHAT GOES AROUND COMES AROUND

some other horrible industry secret that would force me to go down yet another side path, and so on. It has been quite an odyssey, and I have finally conceded that it will never really end. It's far too much of a moving target.

As it has been months since my original headlong dive



**I** once promised you that I would wrap up the mini-series on CD-R. No, actually, I think I promised you three times. Well, here it is.

It has taken this long because there was so much to learn. Every time I thought I had the bottom line, I would discover something that would make me look into some other aspect, and that would reveal

into these dark green waters, you may wish to dig up those four old columns (October and November of '94, and February and March of '95) and re-peruse them before you read this one. You do keep every issue of *Mix* forever, don't you? Of course you do. I have built quite an attractive little pool cabana out of mine. Guests find it charming, if not a bit musty in the rain. If you would like to do this, too, here's a little tip: Put the spines toward the outside and coat them with Minwax clear gloss polyurethane.

I will not re-cover shifting standards or different colored books—be they red, orange or yellow. I will only cover the physical discs themselves, mechanically and chemically.

ILLUSTRATION ANDREW SHACHAT

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## THE MECHANICS OF AUDIO FRISBEEES

CDs and CD-Rs are made in a way that I have always found to be a fascinating combination of well-thought-out, almost indestructible technology mixed with other impressively hokey (and very fragile) ideas.

Let's start at the bottom, the surface that the laser actually sees, since that is obviously more critical than what you see. The first thing that the little infrared diode's laser beam hits is the surface of impressively high-quality polycarbonate resin—the same resin used for eyeglasses. This resin must be very clear, have very low dispersion and diffusion, and must be mechanically stable, as it is both the physical backbone of the disc and the actual mechanical medium that must retain the microscopic data pits. But (and this is the clever part) it doesn't necessarily have to have a pristine surface. It is designed to be so thick that scratches and imperfections on its surface that would seem to interfere with reading data are actually far enough away from the in-

ternal data, surface that they are out of focus to the laser, and so do not really pose too much of a problem. Add to that the fact that redundant data is sprayed around so that if a

**I sold my soul to get this data, and I am bound to not publish the actual results at this time. I will when I can, but for now I can tell you my conclusions and leave it to you to decide if you want to trust me.**

single chunk can't be read for some reason, the disk will offer another copy of it soon afterward in a differ-

ent location (hopefully, no longer directly under that gouge that appeared when your daughter was doing her research on which is harder, diamonds or polycarbonate resin), and the system works quite well.

That's my favorite part of CDs—that the designers were smart enough to make the substrate so thick that surface abuse is out of focus to the laser. It's downhill from here, though. As you know, the back (internal) side of this resin disc is stamped with the data track in production CDs, then flashed with a layer of aluminum a little thicker than you find on an Alabama state trooper's sunglasses. Then lacquer is spun on over that, to keep the aluminum from oxidizing or becoming scratched. The label is printed on top of that.

I travel with CDs all the time, and I replace CDs all the time. My Dire Straits *Brothers In Arms* CD has been replaced three times already, due to that cheesy, weak, thin lacquer layer having been sanded off by engine vibration from DC-10s, 727s and L1011s. That lacquer gives up real easy, and the data follows soon after.

—CONTINUED ON PAGE 192

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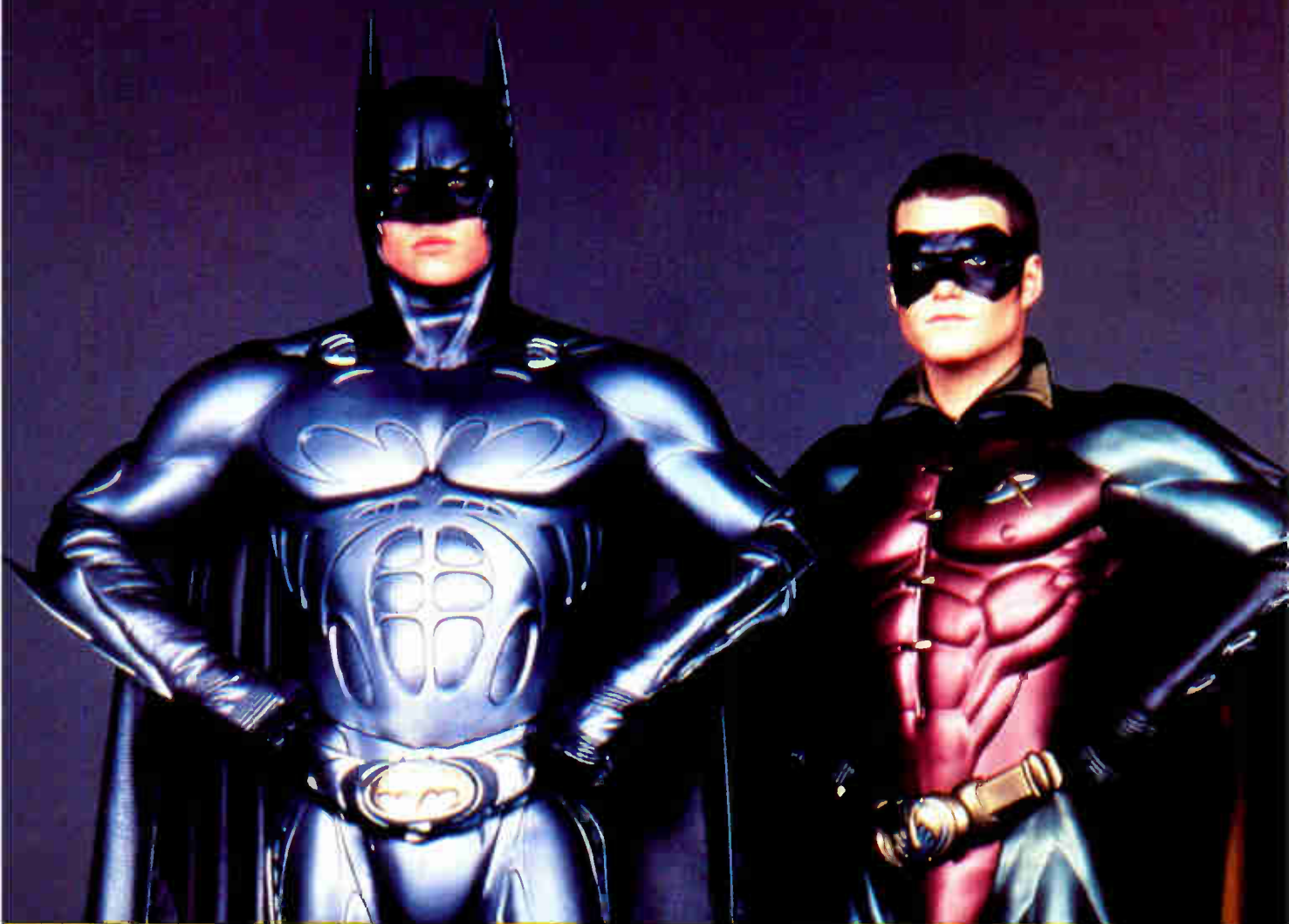
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# THE BAT IS

## Sound Creation for "Batman Forever"



The third time is definitely a charm. In this age of formulaic, unoriginal, easy-money Roman numeral Hollywood sequels, *Batman Forever* strikes a fresh and vibrant chord. All-new cast, all-new crew, a new director (Joel Schumacher), new producer (Peter MacGregor-Scott), and a new sound editorial team—SoundStorm out of Burbank. Warner Bros. is banking on a huge summertime hit, and from the vantage point of temp mix #2 in late April, they've nailed it.

The premise and plot of the film are

comic-book simple. Former Wayne Enterprises employee Mr. E. Nigma (Jim Carrey) is intent on destroying Bruce Wayne (Val Kilmer). He develops The Box, which allows him to suck the brain waves out of Gotham City residents and brings about his transformation into the Riddler. Harvey Two-Face (Tommy Lee Jones), meanwhile, breaks out of Arkham Asylum and sets out to destroy Batman, who put him away and permanently disfigured his visage. When the brains-and-muscle team discovers that Bruce Wayne and Batman are one and the same...well, that's why we pay \$7 a head on

BY TOM KENNY





# BEVERLY





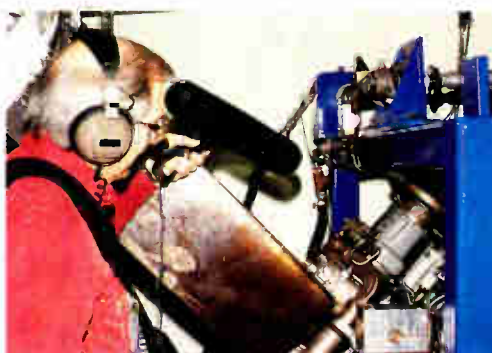


PHOTO: RALPH NELSON/AMAND 1996 DC COMICS

Saturday night.

Of course, there's much more to the 2-hour and 10-minute roller-coaster ride through Gotham City. Through a series of flashbacks (which posed their own sound design challenges), and with the help of Dr. Chase Meridian, Bruce Wayne confronts his parents' death and his origins as Batman. And the astounding number of visual effects—276 optical shots, including the Bat Car, Bat Wing, Bat Boat and Bat-a-rang—and huge, dark-yet-lush, stylized sets provide a backdrop that pays as much homage to comic-strip creator Bob Kane as

**Gathering sounds for the Bat Car (clockwise from below): John Leveque at the Rocket Dyne Space Shuttle facility; Bruce Stambler recording a test on the 800 hp Buick Grand National; Leveque miking a dragster at Pomona Raceway**



they do Tim Burton, creator of *Batmans I and II*. At the same time, they scream with originality.

"This is the most effects-heavy film I've ever seen, both visually and from an audio perspective," says co-supervising sound editor Bruce Stambler. "The only thing I could compare it to would be the last two reels of *Aliens*, where Sigourney is chasing down the monster. But this film is that way front-to-back. We've done a number of action films now [*Under Siege, The Fugitive, Clear and Present Danger*], and we try hard to create a soundtrack that





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...jaws dropped,

Musician Magazine, May '95

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**Right: Setting up in the Mojave Desert to record rocket launches; left: Leveque and Stambler built a custom tripod on location to record rocket pass-bys (after all, they don't shoot these things horizontally).**

doesn't kill the audience. The key is peaks and valleys, and I think we succeed in this film."

"This film is just so much bigger than I expected," adds John Leveque, Stambler's co-supervisor since *Under Siege*. "I've done pictures with special effects, but not like this. This is way beyond the norm. My first thought when we began in November was, 'How are we going to get this done?' I thought that when we did *The Fugitive* we had the tightest post-production schedule in the history of A-films. But this was even tighter, and there's more to it."

Although Stambler and Leveque began in November, and sound designer Lance Brown came on in January, the editorial crew didn't start cutting until April 3. The first temp mix began two weeks later, the second temp mix a week after that. The final began on May 17, for a June 16 release. Fortunately, it's a crack team that has worked together before, and in assigning sequences and reels, an editor's strengths were taken into account: Richard Yawn on explosions and ballistics, Glenn Hoskinson on vehicles, Jay Nierenberg on the flashbacks, etc. From the bottom up, the editorial team raved about the amount of freedom and creative input they were allowed by the supervisors.

"The pressure that we're under with these incredibly tight schedules demands organization and selection," Stambler says. "Our philosophy is such that we don't overdo the Foley, we don't over-pull elements,

we don't try to come up with too much, and we ask that our editors be decisive. We try to have as much finished as possible for the first temp mix, with fine-tuning from that point on, and we don't believe in flooding the dub stage with a lot of alternates. There's no such thing as poor prep, and there's absolutely no room for error in this environment. If a sound's not there at the stage, it ain't gonna be there."

#### **ORIGINAL RECORDING TO BATDAT**

But as Leveque says, audio post is an interdependent, step-by-step process, where the final mix relies on the quality of original recordings, the editor's selections, the transfers, and everything in between. If it falls apart at any point, he says, there's no way to recover. Still, you have to begin somewhere, so he and Stambler began, naturally, in bat caves. But because North American bats lie dormant all winter, they flew to Puerto Rico.

"The first cave we went to was huge, easily the size of two football fields, with a three-story ceiling," Stambler recalls. "The bats would come down one of two legs of a 'Y' each night and spiral out of the opening to go feed on insects—23,000 pounds a night, our guide said. So we got there at dusk, and John and I flipped a coin to see who would go inside and who would wait at the opening. I won, and I picked inside. I go into one of the legs of the Y, and it's damp, hot and pitch, pitch black. The guide had said that there's no way to tell when they would start moving or which side they would come out of, but that I would certainly know it when it happened. Well, I wait 4½ hours, with my [Fostex] PD-2 DAT, testing levels and the like—nothing. I'm about ready to leave when this strange whoosh started to come from the cavern—not really like a

wind, but this unearthly sensation that was more like an energy wave, with high-pitched chattering and wing flaps. I'm up and ready in a second. Then it turns out they flew out the other tunnel. I still got some good sounds, and John got some great stuff at the entrance, but I was disappointed.

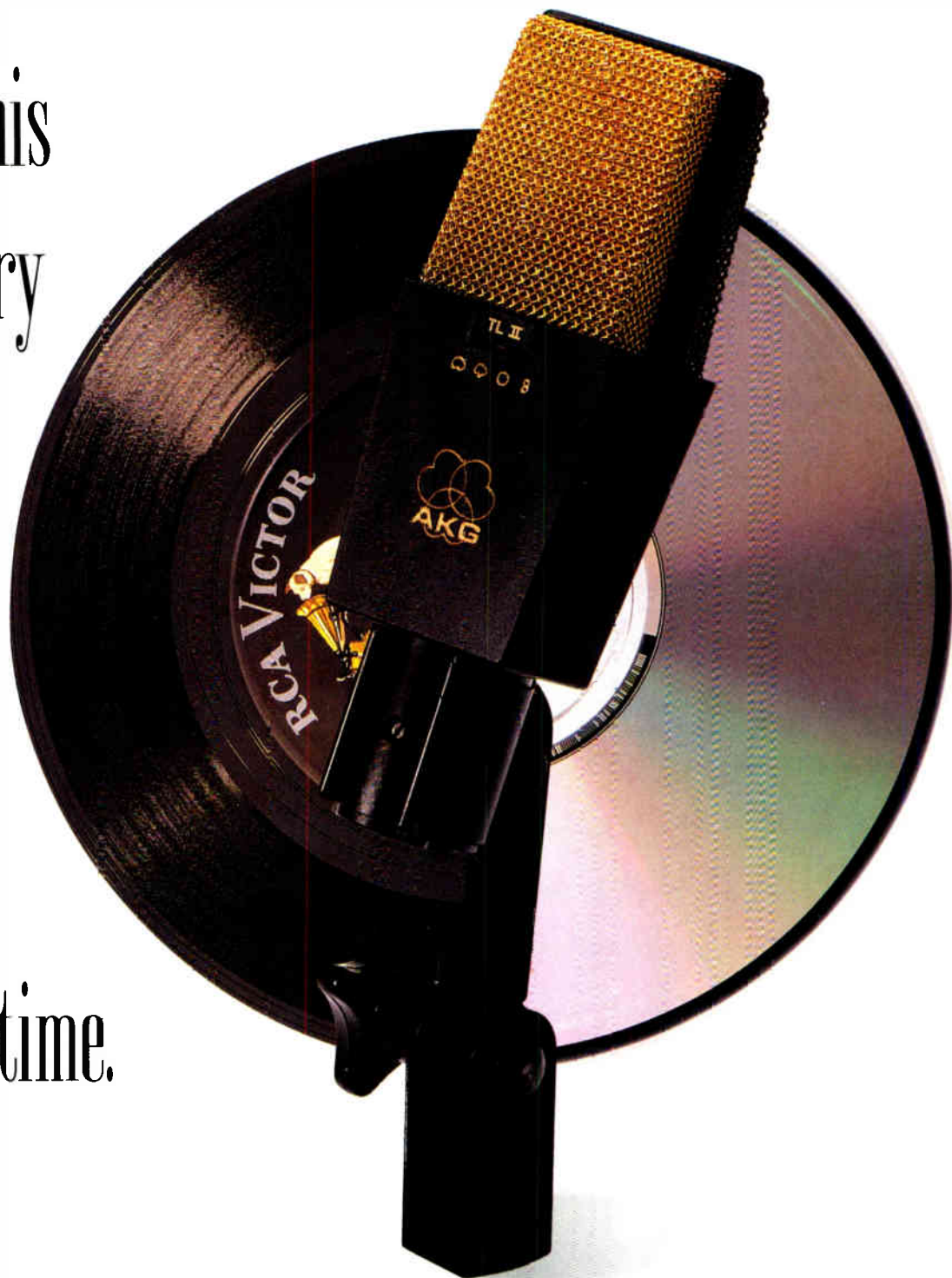
"So we take the two-hour drive back to our hotel, and there's a message waiting from our guide, saying, 'Be ready for pickup at 1 tomorrow. We're going to the Cave of the Snakes.' Well, I'm not an outdoors-type guy, and I'm not real crazy about snakes. But we're there, so we do it.

"It's called Cave of the Snakes because these boa constrictors hang on trees outside the entrance and feed on the bats as they fly out each night. We go in, and there's about eight inches of guano on the floor. I shine my flashlight down, and it's wall-to-wall cockroaches. I shine the light on the wall, and about every five feet there's a tarantula bigger than my hand. It's 110 degrees and wet. I slipped a couple of times and fell, with my equipment. But the PD-2 was durable as hell, and we got some great bat sounds." The bat cave ambience is augmented in the film by waves crashing on rock and other elements, for a varied, organic feel to accompany the high-tech gadgetry. And the wing flaps and screeches are used throughout the flashbacks and bat-cave scenes.

Because the look and feel of the film is not based in reality, in-house effects libraries just wouldn't work. About 99% of the film is original recordings, according to Stambler, and they "shot" sound in locations as varied as the Mojave Desert (all types of vehicles and motorcycles for the big car chase, as well as rocket launches for sweetening), an air show in Oklahoma City (to record the Bud Light mini-jet), the Pomona Fairplex raceway (for dragster en-



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## THE BAT SOUND CREW

"This film, with this schedule, couldn't have been done on mag," says co-supervising sound editor Bruce Stambler. "And it certainly couldn't have been done without this crew."

### SOUND EDITING

#### Supervising Sound Editors:

Bruce Stambler, John Leveque

#### Supervising Dialog Editor:

Becky Sullivan

#### Supervising ADR Editor:

Fred Stafford

#### Sound Effects Editors:

Don Warner, Jay Nierenberg, Richard Yawn, Bernard Weiser, Kim Secrist, Glenn Hoskinson, Steve Mann

#### Dialog Editors:

Kimberly Voigt, Sukey Fontelieu, Tony Milch

#### Sound Design:

Lance Brown, Frank Kniest, Roland Thai

#### Supervising Foley Editor:

Shawn Sykora

#### Foley Editors:

Michael Dressel, Jim Likowski, Steve Richardson

#### ADR Editor:

Zack Davis

#### Assistant Sound Editors:

Lance Laurienzo, Steven Gerrior,

Jeff Cranford, Marc Deschaine,

Chris Rouse

#### Transfer:

Gary Blufer,

Kelly Cabral

#### Operations:

Gordon Ecker,

Blake Marion, John Fanaris,

Deryk Morgan, Dawn Kratofil

#### Foley Artists:

John Roesch,

Hilda Hodges

#### Foley Recordists:

Mary Jo Lang, Carolyn Tapp

#### Composer:

Elliot Goldenthal

#### Scoring Engineer:

Steve McLaughlin

#### Music Editors:

Zigmund Gron,

Chris Brooks

#### Re-Recording Mixers:

Donald O. Mitchell, Michael Herbick,

Frank Montano

### PICTURE EDITING

#### Picture Editor:

Dennis Virkler

#### 1st Assistant Picture Editor:

Mark Stevens

#### Picture Assistants:

Dawn King,

Adam Boome, Gina Zappala,

Jonathan Alvord, Kerry Kerwin,

Melissa Kent, Judd Nealon. ■

gines and wheel squeals) and Rocket Dyne in Canoga Park, where they make the engines for the Space Shuttle.

"I've never heard or felt anything like those engines," Stambler says.

"We set up a couple of hundred yards away when they tested one, and it wasn't so much the roar, which was deafening, as it was the low-frequency rush that just passed through my body. I felt nauseated

by the end of the day, and I'm not even sure we'll get to use it for the Bat Car because it's just too big. But we got some great liquid and pipe sounds, too, because they pump thousands of gallons of water a sec-

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ond under these engines to absorb the heat, and they have a whole manufacturing system set up.”

Finally, one of the goals for the audio tracks was to add a bit of light-heartedness to what can sometimes seem rather scary scenes or situations. It is, after all, a PG-13 movie, and the tone is not as dark as the first two Batman films. In one scene, for example, the Riddler dances around, dropping toy-like hand grenades. “We thought, ‘Oh no, there’s ten more explosions,’” says Stambler. “Fortunately, they looked like toys, so we recorded a rather unique comic library on a Foley stage one day, where we scooped up a bunch of my son Robby’s little wind-up toys—those things that flip when they’re wound up. Then we augment that and add some boings for when the bombs hit the floor. It takes the edge off the explosions and makes them hysterical. We did it more or less as an experiment, but Joel [Schumacher] was ecstatic.”

“We thought we’d try something a little beyond the visual,” adds Leveque. “But that’s what a temp is for,

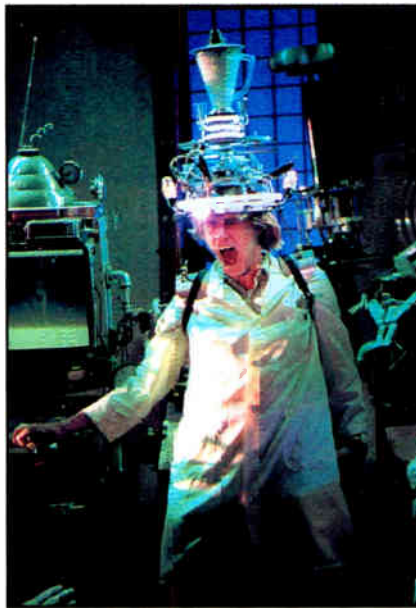


PHOTO: RAUPH NELSON/WANG © 1995 DC COMICS

to experiment. It’s easy to pull back, but it’s hard to push the envelope at that point.”

#### SOUND DESIGN

For *Batman Forever*, SoundStorm set up its first-ever sound design station, based around the Fostex Foundation 2000 and the E-mu E-IV, and helmed primarily by Lance Brown. Sound-

Storm is the only Hollywood editorial house to make such a large commitment to the Fostex workstation, having purchased eight systems, with plans to add up to 18 more, probably the scaled-down RE for brute editing. Across the board, the editors raved about the unit, for everything from its tactile feel, to its ability to make changes, to the fact that there’s no mouse and you don’t have to maneuver through windows. It was, they say, built for film sound editors, and they ought to know—their input, led by president Gordon Ecker, was instrumental in the unit’s development. Most of the 2000s are used simply for editing; Brown’s is the only souped-up station at this point, with full mix capabilities and the just-released TimeFlex time compression/expansion.

“The credits will be kind of odd in this movie,” Brown says. “Really, the whole crew is doing the sound design, with Bruce and John providing the overall vision. Everyone is encouraged to put their creative input into the sound job, and the editors are just as much a creative in-

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**Stambler and Lance Brown prepare to record a Cobra helicopter.**

fluence as the people selecting the sounds, myself included. It's not just, 'cut what we pull.'"

Like everyone else associated with the project, Brown was overwhelmed by the amount of material that would be required and the unique bits of gadgetry and effects that had no precedent. His principal assignments were the Bat Car, the Box and the giant (16-foot wingspan) bat, which, in a near-hallucinatory fashion, is crucial to the flashback scenes.

The core sound of the Bat Car is made up of about 20 elements,

reaching up to as many as 60, depending on the visual. A bunch of vehicles, including fire engines and dragsters, were recorded, with the core element being an 800-horsepower Buick Grand National with turbo whine that Stambler found while flipping through *Car Craft* magazine ("0-130 mph in 10.3 seconds," says Stambler, who owns a Grand National himself).

"The Bat Car seemed to come together pretty easily, actually," Brown says. "The trick is to make it constantly varied and avoid monotony. For all the approaches and pass-bys, it's the Buick Grand National, sweetened with some dragsters and other elements. Then, at the point it passes and you move to the rear, we took some of the elements from the Rocket Dyne sessions, augmented with some real rockets, jet roars and some fire sweetener. It gives you a sense that the car is more complex by varying the sound as you move around. We could easily just leave it a big roar, but that wouldn't be very

interesting.

"The interior of the Bat Car actually comes from Bruce and John's rental car in Puerto Rico, as they drove over this sort of unique grading," he adds. "I put that in the E-IV and totally twisted it, then added the electronic stuff—little servos and beeps and motors."

The Box, the Riddler's mind-reading device, was a combination of lightning, electrical devices and synth-generated sounds, more like James Bond specialty stuff, or laboratories, according to Brown.

The flashback sequences, in which Bruce Wayne confronts the death of his parents and his birth as Batman, were perhaps the most challenging scenes to design. Brown worked them up in conjunction with editor Jay Nierenberg.

"You have to start with what's there on the screen as you transition from the present to the past," Nierenberg explains. "In one scene, for example, he's at the hearth and there's a clock on the mantel, so we use some fire and clicks to spin in and out. But by and large, we tried to work with some elements that may

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be peripheral and stayed away from the more standard stuff, such as lightning cracks on an ugly, stormy day. There's another scene where we have the young Bruce Wayne walking through the church at his parents' wake, and we decided to go with wooden coffin creaks and coffin slams and metal screeches—things that might pass through a young boy's head in a situation like that.

"We also spent a lot of time on flashback ambiences," he continues, "working with essentially five different intensities. In each flashback, it worked out that there were several points to escalate the intensity, from lowest pitch to highest pitch. It worked in the cave, in the church, and then we add specific designed effects on top. The key is to keep it interesting over time."

"The flashbacks are some of the hardest scenes," adds Leveque, "because you have what is a traditionally scary moment for a little boy whose parents get killed. Then there's a bat cave and a bat that attacks him. It's frightening, especially in terms of how flashbacks are put together. But we don't want it to be



frightening; we want it to be haunting and we want it to be evocative—at the same time powerful but not scary. This is a PG movie, and we want to take the audience someplace they've never been before, without alienating them. Haunting is more difficult than scary. It's the same thing with fun. To make a movie fun is very difficult. Putting cartoon effects to every head hit is easy, but it wouldn't mean anything in this context."

#### ADR, FOLEY AND SCORE

"It's a shame we had to ADR this guy," said producer Peter MacGregor-Scott, pointing to Jim Carrey on the screen. "His performance is phenomenal, and then he pulled it off again in the studio. He's unbelievable." It's true. Carrey ad-libbed many of his lines on the set, then duplicated the energy, rhythm and

performance on the ADR stage. Not an easy task. Even at the temp mix, it was difficult to pick out which lines were replaced.

But then, depending on who you talk to, anywhere from two-thirds to 90% of the film is ADR—somewhere in the neighborhood of 2,500 lines according to dialog supervisor Becky Sullivan, who worked in tandem with ADR supervisor Fred Stafford. The reason for the large number of lines was mainly due to the nature of the sets, which were lit extensively and filled with smoke machines, wind machines and other noise-generating devices. Also, some were constructed at Long Beach's Spruce Goose facility, which is cavernous, echo-y, and right near a shipping port.

With more than 48 features to her credit over the past ten years, Sullivan serves as part-time coach, psychologist and technician to actors. She also faced an incredibly tight schedule and had to coordinate with talent that was literally all over the planet working on other projects: Carrey ("the most prepared actor I've worked with," Sullivan says) in San Antonio and Charlotte, N.C., Nicole

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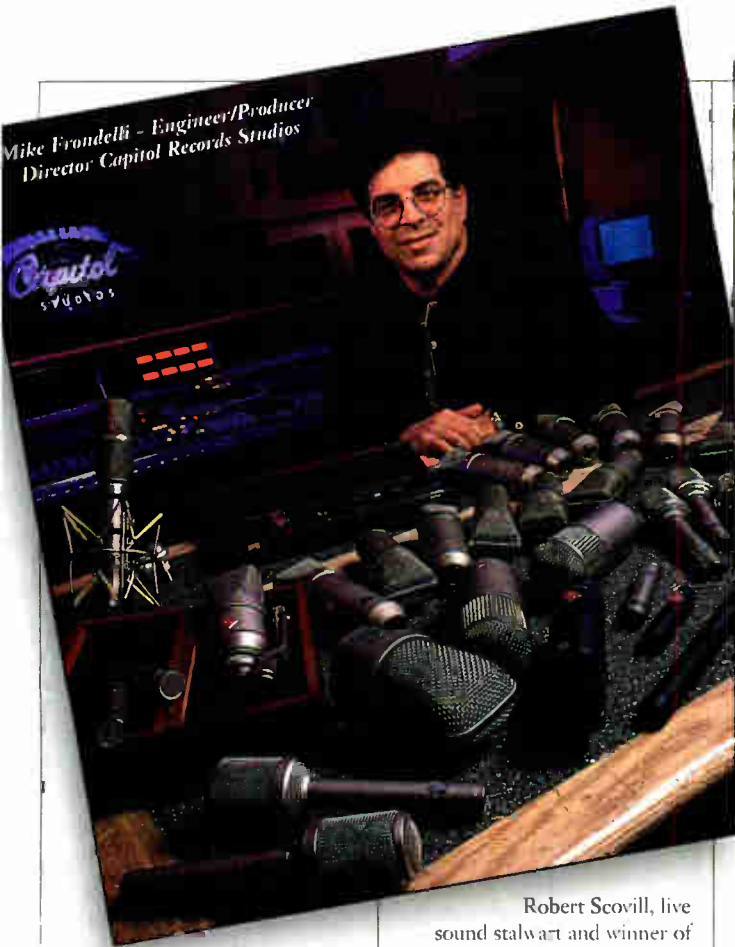
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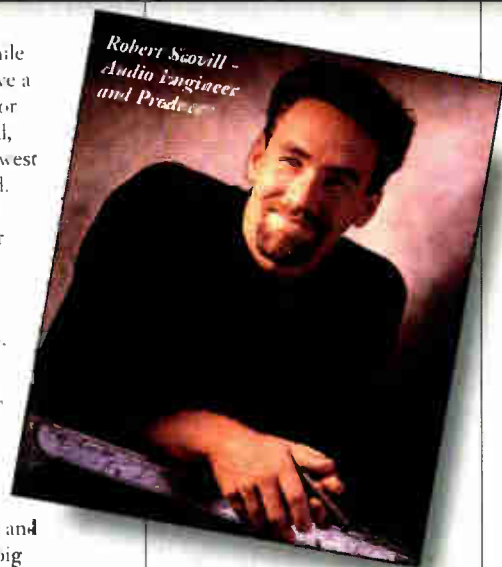
Robert Scovill, live sound stalwart and winner of three TEC awards for Live Sound Excellence, knows a great microphone when he hears one. He has toured as the front-of-house mixer with bands like Rush, Def Leppard and most recently Tom Petty.

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Kidman by phone-patch in London, Chris O'Donnell in Chicago, Tommy Lee-Jones and Val Kilmer, thankfully, were in L.A.

"My first job is to listen to every single DAT, even from the takes that weren't printed, and try to save the production track," Sullivan says. "Then, since I've been working with Bruce and John for about seven years now, I try to think of effects and how scenes will play as a whole. For example, we have a scene where Jim Carrey is in his apartment-lab typing at the keyboard, so we put in a playful hum as he punches away.

"We also recorded a lot of group ADR," she continues, "especially for the big circus scene. In a situation like that, you don't need the crowd roar—we have plenty of crowds in effects. You want what I call 'free and clears,' pieces that peek through the walla. For instance, we might have somebody yell, 'There's Harvey Two-Face!' followed by a pause, then somebody yells, 'He's a murderer!' followed by somebody yelling 'Run!' You need interesting spikes in the group, or else it just turns to mush.

"I also really appreciated the director, Joel, because he allowed me some freedom, sought my advice, and in one case incorporated an idea I had. For one of the flashbacks, where the young Bruce Wayne is at the wake, I thought it would work well within the effects if exaggerated breathing was prominent. Then the older Bruce Wayne breathing becomes a transitional element, and it works emotionally. In another case, some light ADR sobbing is used as an effect. So you always have to think of the movie as a whole."

The SoundStorm philosophy seems to be that Foley should not be overdone. It should be used for footsteps, clothing rustles and the like—the more traditional Foley elements—but not for every door slam. Stambler's feeling is that with the 6-channel digital formats, Foley should be used to augment and work with well-recorded and well-edited effects. They hired first-call Foley walkers John Roesch and Hilda Hodges, and gave them the rubber bat suit to play with for a week. (No jokes, please.)

Elliot Goldenthal composed the sometimes tender, sometimes hero-



ic, always dynamic score, which was recorded in early May at the Sony stage in Culver City by engineer Steve McLaughlin. The mixdown from 48-track digital took place at The Chapel.

Music for the final mix was played back directly from a portable 8-channel Pro Tools III system, controlled by music editors Zigmund Gron and Chris Brooks. A timecode feed from the board was fed to the Opcode Studio 4, then the LTC code was sent to the Power PC. All of the cues, some of which were final for the temp mix, resided in 2.4-gigabyte hard drives, which could be popped out and worked on in the background while the dub continued.

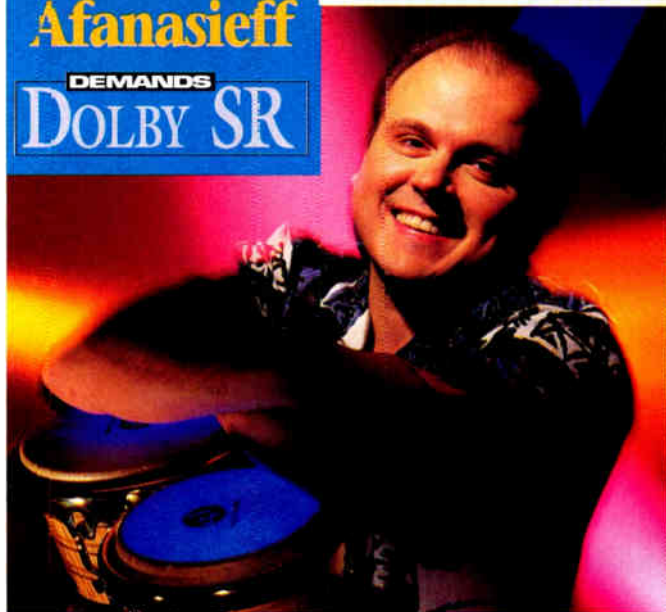
Re-recording mixers Donald "Papa-san" O. Mitchell, Michael "Mikey" Herbick, and Frank "fill-in-the-blank" Montano—perhaps the finest team never to win an Oscar—handled both temp mixes and the final at Warner Bros. Studio Facilities' relatively new Dub Stage 2. Part of the recent facilitywide upgrade, Stage 2 sports a custom hybrid SSL 8000/5000 board and custom, in-house-designed, three-way monitoring system (JBLs for the highs, Community for the mids and Turbosound LF for the lows).

"If this crew doesn't win the Oscar, I'm getting out of the business," said a half-joking MacGregor-Scott, a former sound editor whose energy and style are infectious. "We thought we might get it on *The Fugitive*, but we settled for the British Academy. And this is even better. I keep saying that some day, in a pinch, I'm going to release a temp mix. They're that good."

Despite the incredible pressure of the tight post-production schedule, not to mention the pressure of a big, big film, the mood at SoundStorm with a month to go was completely relaxed. Yes, 16-hour days were the norm, and yes, the ulcers may have been churning away on the inside. But they had all the confidence and precision of an Indianapolis 500 pit crew—everybody dependent on everybody else, and hey, they've been in the big race before. It is not a large crew, as far as big pictures go. But it's solid. And enormously creative. Count on them for a fourth straight Oscar nomination. ■

Tom Kenny is Mix associate editor.

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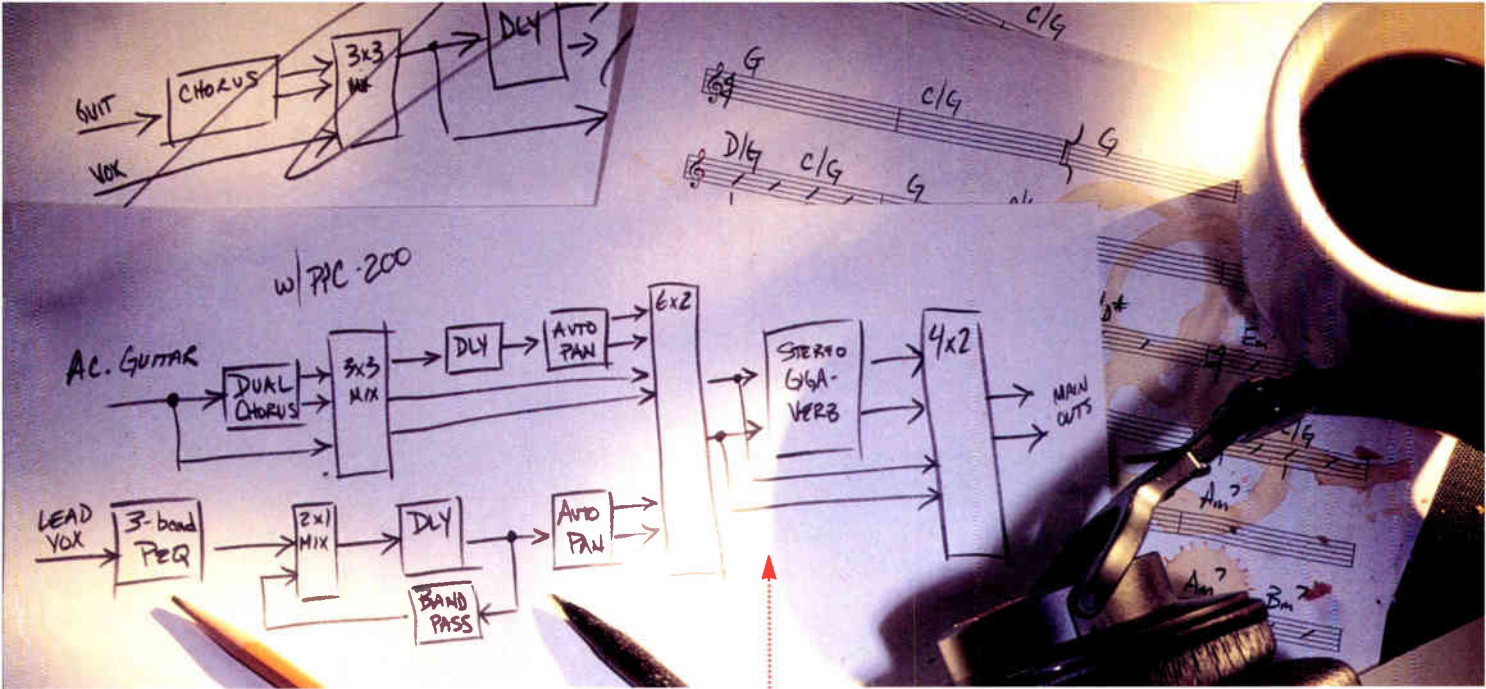
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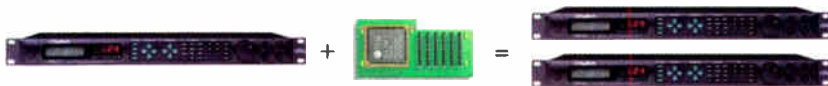




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## by Dan Daley

You can't talk about Nashville without talking about country music. And you can't talk about Nashville studios without talking about rates, because that is what's on their minds down here. Country music is at the crest of a five-year surge that saw sales of nearly \$2 billion last year, most of it produced in Nashville. But the proliferation of artist rosters from perhaps 75, on seven or so labels, ten years ago to nearly 200, now on close to 20 labels, has meant that not everyone is getting the same budgets. For every Reba McEntire or Garth Brooks record, there are a dozen or more baby acts whose first-record budgets might be half those of the megastars. Added to that are the development deals that require pre-productions at even lower budgets.

This might average out, considering the fact that all types of albums tend to be concentrated in the roughly two dozen primary country-based studios along and near Music Row. But the press of technology demanded by producers and engineers as they try to compete with pop music, combined with the fact that Nashville has perhaps the highest per capita

concentration of pro studios anywhere in the world, have conspired to hold rates down, or even force them lower. The slight increases that some studios report in their rate structures are balanced by the fact that those increases don't effectively amortize the new equipment the studios bought or intend to buy.

This scenario is familiar to studio owners in New York and Los Angeles. But Nashville's version is perhaps more intense because of the number of studios and other factors. Los Angeles has felt the impact of sophisticated, home-based project studios (see HARP);

Nashville, on the other hand, has to contend with studios owned by producers who, in many cases, are the same label heads approving budgets. Project studios, a trend being fueled by the massive influx of California music industry refugees to Nashville, are mainly clustered in the affluent suburb of Williamson County, where

they have been used mainly by owners in the burgeoning contemporary Christian music industry. But while their effects have yet to be felt on any scale, they're waiting there on the southern flank of Nashville like Grant's army once did.

So although there is plenty of work for



PHOTOS AT RIGHT BY BILL SCHWOB





# NASHVILLE

RATES AND TECHNOLOGY UNDER THE MICROSCOPE

# STUDIOS





major and mid-sized Nashville studios, their profitability hinges on relatively small variations in rates as a percentage of technology investments, as well as other overhead costs. But that equation is not trivial, as anyone who follows the currency markets can tell you: A fraction of a point either way is the difference between a boom and a bust.

Milan Bogdan, general manager at Emerald Recording, whose main room has an SSL console, has been vocal about the rate structure in Nashville for some time, and the irony of how the success of country



PHOTO: ROBIN HOOD

**Nashville skyline**

music has exacerbated the issue has not escaped him. He bought a Sony 3348 digital multitrack recently under pressure from producers who are moving toward that format and away from the former Nashville standard, the 32-track ProDigi format. But he canceled plans for adding a mix room and has instead turned a former broadcast control room and conference room into a small, less expensive overdub studio with a Mackie console. "The bigger acts, like Wynonna Judd, George Strait and Mark Knopfler, have the bigger budgets, but the smaller acts far outnumber

## Production Assistants

### THE NEW POWER BROKERS

In addition to the engineers, producers and musicians that studio owners encounter daily comes a relatively new group: independent, professional production assistants. Traditionally, Nashville producers have used production assistants, usually someone on the staff at the label where they worked or an office person who added studio coordination as a regular task. In the past several years, however, the modus operandi of country producers working on several records simultaneously has strained that structure. Enter the professional production assistant—someone with a diverse background in the music industry who can pull all the elements of studio booking, rate negotiations, musician bookings, union contracts and, in some cases, screening material, together for the producers. For a fee, of course, but one that's definitely earned; country still relies on live musicians, and tracking dates can require booking as many as seven to ten musicians two months in advance, booking the few tracking rooms in Nashville, getting the right engineer onto the schedule and doing this around the multiple, often overlapping sessions that producers do in the course of a year.

Joe Johnston used to be in advertising in Dallas but gave it up, like thousands of others, to be a Nashville songwriter and producer. Along the way, he worked at a Nashville publishing company and later became an independent song plugger, neither of which he felt terribly strong about; they were simply day jobs to support his songwriting. As a song plugger, he shared an office on Music Row five years ago with producer Mark Wright (Clint Black), and Wright would occasionally ask him to help coordinate schedules. That eventually turned into a full-time job, and he's since

added producer Josh Leo (Restless Heart, Alabama) to the short list of producers for whom he does production scheduling. "What I do is take care of everything to the point where the producer just shows up," including help in the A&R process, says Johnston.

Lauren Koch (pronounced "Cook") came from Hermosa Beach, Calif., where she managed hard rock studios Clover and Total Access after graduating college. Seven years ago, she came to Nashville and went to work at RCA Records as A&R administrator for recording. After finding the ten-to-six label gig a bit of a grind, she sensed this niche in the recording industry and went for it, becoming, by her own estimate, the first professional independent production assistant. Her current clients include Emory Gordy, Biff Watson and John Guss, although she is also called upon to coordinate for acts from outside of Nashville, including a recent visit by The Chieftains. "I don't do A&R for the producers I work for," says Koch, who charges five percent of the total recording budget as her fee, averaging between \$6,000 and \$8,000 per project on about six projects per year. "But I do things that other coordinators don't, such as review the producer's contract and deal with the attorneys. The thing that we all try to do is be service-oriented."

Ginny Johnson used to do the production coordination for producer Jerry Crutchfield (Tanya Tucker) as a staffer at his office, after working at Capitol/Liberty Records and MCA Publishing. She took the concept freelance a little over a year ago and now does it regularly for producers Paul Worley, Ed Seay, John Hobbs, Gregg Brown, Joe Tassi, Blake Mevis and Justin Niebank from her office at Soundstage Studios, working for a flat fee of between \$3,000 and \$5,000 per project, depending on its scope. Despite her office location, she

—CONTINUED ON PAGE 56



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ber them," says Bogdan. "It's harder to get the higher rates for them, and that inhibits growth for new rooms and more sophisticated gear.

"Rates may go up slightly over time, but they're not keeping pace with the cost of equipment, salaries and other things," he continues. "And Tennessee charges a luxury tax on high-ticket items, including consoles and digital tape machines. After buying a 3348 for around \$200,000 with all the support for it, I can't go back to the studio owner and ask for 2 million dollars to build a mix room. It's a matter of rates vs. technology. There's a lot of great stuff out there, but you can't afford to buy all of it."

At Soundstage, manager Michael Koreiba says that he was able to increase rates by about \$100 per day for each of his three recording

rooms two years ago, but not since then. "Another rate increase would be nice," he says wistfully. "But the rates have to reflect the equipment. We were one of the first to get a 3348, but as other studios get them, the field levels out and the rate was begin again. I don't see Nashville breaking the \$2,000-a-day rate level." Soundstage's rates seem indicative of other upper-echelon rooms' experience—the studio charged \$1,500 per day five years ago, including use of a Mitsubishi 32-track deck; its current daily rate, including 48-track digital, is \$1,850.

Recording Arts owner Carl Tatz says, "A year ago, no one tried to grind me down on rates, and now they do. There are too many studios, and too many of them are owned by producers. It's actually not so much the [country] label stuff as it is the influx of so many other types of music from L.A. and New York. Some of them want to play ball in country and learn those protocols; others don't and look for studios and rates based on their experiences elsewhere. I don't know how it's going

to shake itself out in the end." Tatz recently did a major remodeling of his single-room facility, aesthetically and technologically, and is presently considering a new console to replace his Soundcraft. "You have to refurbish just to stay even," he says.

Preston Sullivan, manager of Sixteenth Avenue Sound, says essentially the same thing, although he is more candid about the pressures coming from engineers and producers who want to see technological upgrades but don't necessarily want to pay more for them. "In a way, you can't blame them," he says. "When country starts making this kind of money, everybody just wants more of everything."

Mike Janas, manager at The Castle Studios, says the rates issue is simply endemic to the industry and that it's not peculiar to Nashville. What is, however, is the fact that more work stays in town, to the benefit of the studios in terms of volume, if not rates. "When Jonel Mosser did her record at Woodland Recording, instead of Ed Cherney flying her out to L.A. to use the Los Angeles musicians, Ed came to Nashville and flew

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Russ Kunkel and other players in here," he notes. "What I think is more of an issue in Nashville at the moment is all these stinking formats—ADAT, 32-track, two different 48-tracks, DA-88. I have a country project coming in here this spring that's using all four of them. And everything is a la carte in Nashville—second engineers, engineers. It all affects rates, but it's more than just buying technology; it's choosing it and the people to run it."

At Masterfonics, studio owner/engineer Glenn Meadows oversees six rooms and is awaiting the completion of a \$2-million, Tom Hidley-designed tracking room at another location, scheduled for September. He takes a slightly different view of the rate situation: "I fault the studio community itself for failing to educate the A&R departments about the technology and what it costs," he says. "They've simply come to expect it to be there. I was recently talking with an A&R person from one of the labels, and he had just gone over to England and saw an SSL 9000 under construction. He got a grasp of what goes into it and what it costs. You have to show

**Live music at the Bluebird Cafe, one of many performance venues for artists in Nashville**



the A&R people what the profit margins really are and let them know that if this trend continues, the technology won't be there for them in the future."

Meadows also mentioned an organization little known outside of Nashville's music community: Leadership Music, a group of people representing all aspects of Nashville's music industry, including A&R, studio owners, engineers, producers, musicians, managers and publishers. Membership is by nomination and group vote, and requires a commit-

ment of a year for one intense session per month from October through May, covering a specific aspect of the music business in Nashville. "It's not being used properly," he complains. "In its early days the program included a lot of detail on studio operations and expenses. The curriculum changes every year, and that part of the curriculum has been forgotten." Meadows, an alumni of the program, says he wants to work to bring studio business back to the top of the agenda in the future.

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# NASHVILLE STUDIOS

Not complaining is Scot Merry, who with partner Paul Scholten owns County Q Recording, ostensibly Nashville's busiest demo mill. The consoles are an older Trident, a Sound Workshop and a Mackie, working off analog 24-track decks and a recently installed Pro Tools system. County Q feels virtually no pressure to upgrade because its client base is working for the most part off limited publishing demo budgets, and County Q responds by providing them with full service that puts studio time, tape, engineering, copies, musicians and production all on a single invoice.

"We're not trying to be a [Music] Row studio, and we're not worried about project studios, because in Nashville the band is still king for making demos—you need a live band and a room to record them in,"

Merry says. "You don't make good country demos on MIDI. You need the musicians and the interaction to come up with hooks."

County Q rates are by the hour, based on the three-hour session times established by the musicians' union. "We get \$60 to \$70 per hour, a bit less on off-peak times, and you're buying musicians in three-hour blocks," Merry explains. "And you're getting no real difference between master quality and demo quality; the difference in Nashville is in the market for the end result, not the attitude. Masters go to the public, and the demos stay in the industry. And ask yourself, who do you think listens more critically? And, you get free Cokes."

## THE PRODUCERS

A core of producers puts out the majority of Nashville product, and they acknowledge that the studio community is limited in its ability to raise rates and limited in its depth—a legacy of years in which country records needed to only be "good enough." They recognize the effects of the fact that producers with bud-

get approval status own many of the facilities. "I see a town with a lot of mediocre studios and three or four great ones," observes Tony Brown, producer (for Reba McEntire, Vince Gill, Wynonna and other multi-Platinum acts) and president of MCA Records Nashville, currently country's most successful label. Perhaps more significantly, Brown doesn't own a studio in Nashville.

"Needless to say, it's frustrating to try to get into the great ones when you need to, so you either compromise or you wait. I'll usually wait. I like to mix at Masterfonics and track at Emerald. This town has a dire shortage of good tracking and mixing rooms, and those are two of the best. But there's more coming."

Brown is referring to a pair of studios being built by Reba McEntire's Starstruck Entertainment on Music Row, scheduled to open early next year with Nashville's first two SSL 9000J consoles, and Masterfonics' own tracking room under construction. "But it's a matter of personal taste," Brown adds. "The most successful records to come out of Nashville were made at Jack's

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Tracks," a reference to the small studio owned by Allen Reynolds, producer of the 50-million-unit-selling Garth Brooks.

Brown says he feels no particular loyalty to any one studio, and that he makes his facility choices based on quality and service; equipment is not always an issue, because whatever's needed can always be rented. "That's the reason I give Dreamhire and Underground Sound so much business," he says. "I wouldn't tell a studio that they had to buy something in order for me to work there. That's something Jimmy Bowen did, and I'm glad he did, because that helped bring the studios here up in the first place. [Bowen, recently retired as head of Liberty Records, could push things: He once had Soundstage construct a tracking room for him with no wall between it and the control room.] And if a producer owns his own studio, that's fine. James [Stroud, Giant Records president and producer], Allen [Reynolds] and Garth [Fundis, producer of Trisha Yearwood] have their own studios and do some of the biggest acts in town."

That observation is amplified by producer Mark Bright (Blackhawk), who notes that most of Nashville's studios are owned fully or to some degree by country producers and/or engineers. A quick survey of a studio database of significant facilities showed only three Row-area studios out of 16 not owned by producers/engineers. "There's an argument that producer-owned studios don't have the same market pressures on them to compete," says Bright. "But I think the opposite is true. I think places like Loud [owned by James Stroud and producer Richard Landis] have helped bring the level of technology up in Nashville over the years."

Bright, who does not own a studio, is aware that rates have been relatively stagnant and says he tries to compensate for that in his budgeting for records, allowing for additional time in the studio. He also uses engineers who own some of the larger-ticket items in demand, everything from 32-track PD-format machines to specialized mic pre-amps. And many of the engineers he works with own studios, such as Mike Clute, owner of Midtown Tone & Volume, where Blackhawk was recorded. "One of the reasons I think Blackhawk was successful was



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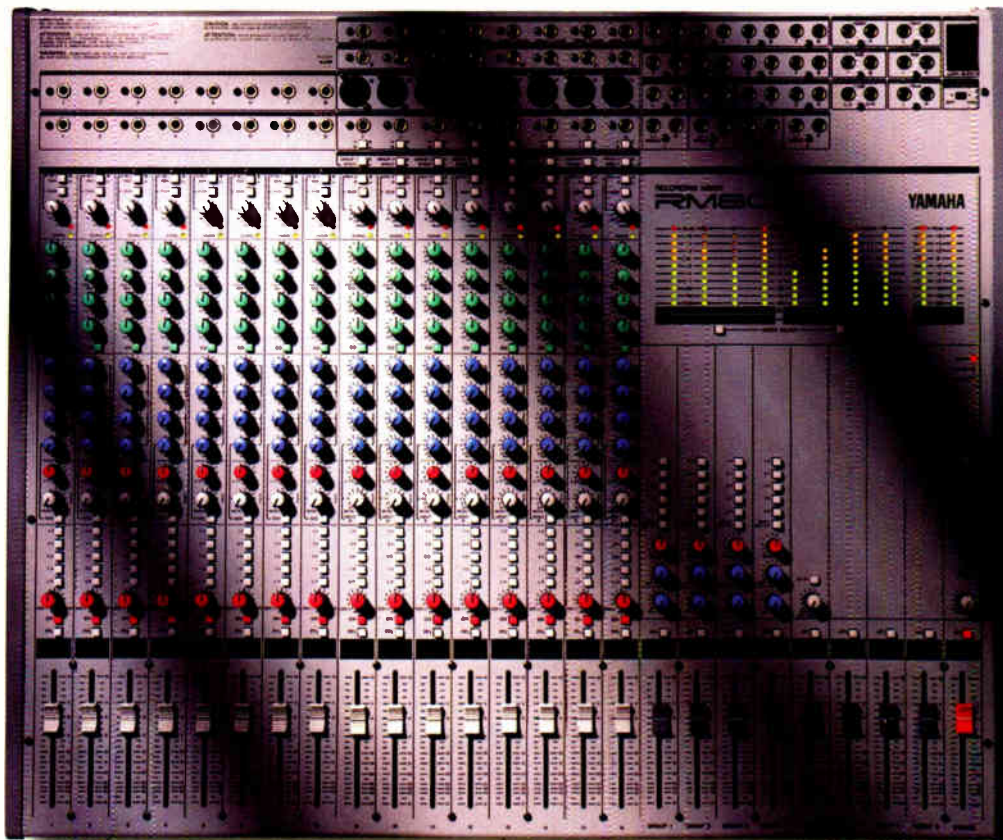


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## NASHVILLE STUDIOS

because we padded the budget and spent a lot of time in the studio," he says. "I also rent things like the Fairlight MFX system to clean up vocals and drum tracks. That's costly and time-consuming, but worth it. You can't put a price tag on creativity, and if I give the label an incredibly successful record [Blackhawk went Platinum early this year], then they're not so upset when I go over budget."

Bright thinks that the current scenario will remain stable in Nashville, and that includes rates and technology. "Not many places are going to be following Reba's lead and getting SSL 9000s," he says. "I think more rooms will have to specialize, in overdubs or mixing, for example, and that's going to be a good opportunity for mid-sized rooms."

Despite an ever-tighter profitability situation, Tony Brown believes that Nashville studios will remain competitive with each other and with the rest of the world, though the competition will be more intense. Studios in nearby Franklin are beginning to affect cash flow in Nashville for overdubs and other applications, he says. "The last record with Rodney [Crowell], he was bouncing all over the place, doing overdubs in places I had never heard of," Brown laughs. "And then there's the ADATs changing everything; I was doing background vocals on Wynonna with Andrew Gold, and they were passed back and forth on ADAT tapes. So there's something shaking in Nashville. But the music's not going to leave here; in fact, more of it's coming here every day."

### A VIEW FROM THE FRONT OFFICE

As might be expected from those paying the bills, record companies feel that budgets are increasing rather than decreasing. Lisa Bradley, A&R coordinator at Warner Bros. Records in Nashville, whose job includes auditing record budgets and directing payments to studios from WB's Burbank, Calif., headquarters, says that that's true across the board,

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# \$ NASHVILLE STUDIOS

from acts such as Travis Tritt and Randy Travis, to middle-level acts like Little Texas, whose first album cost \$80,000 and whose follow-up came in at \$200,000, to the new acts like Russ Taff, whose debut record on Warners cost close to the Nashville average of \$150,000.

Then there are the development acts that Bradley says the label is spending more time with while decreasing the number of signings. Development budgets are numerous but relatively small, ranging mostly from \$5,000 to \$15,000. However, they include no producer's fee, from which one could reasonably infer that significant portions of those development budgets are being directed toward producers' personal and home studios, and/or are also causing producers to call in favors from commercial studios (which some studio owners acknowledge they do) as sessions exceed the development budget. Bradley also points out that the number of single dance and radio remixes of country records is on the upswing; however, those also often wend their way into smaller personal studios. "We're seeing roughly the same amounts of money go out in recording budgets, but it's possible that not all of it is going to the same places as before," says Bradley.

Susan Heard, director of production at Arista/Nashville, says her label's recording budgets have gone up across the board, albeit only marginally. Heard, who managed engineer Bill Schnee's studio in Los Angeles for two years, is quite aware of the effect project studios have had in Los Angeles but says the phenomenon has had little impact on Nashville sessions at this point. "We're still dealing mainly with the same studios we always have," Heard states. "However, for Christian music, that's a different story. I worked at Sparrow Records, and the budgets for that type of record are considerably lower, so a lot of the budgets went to producers' [home] studios." Heard acknowledges, though, that at least some of the

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## NASHVILLE STUDIOS

country recording monies are going to home studios for dance remixes. "That goes partially outside the usual loop," she says. "But the major studios are also being booked for portions of dance remixes."

### ENGINEER'S POV

That elusive but very real concept, "quality of life," is the most oft-cited reason for the migration of engineers to Nashville, mostly from the coasts. What they've found, most say, is a

technology base that's more than sufficient for their work. "Nashville's always been technologically advanced," says Rob Feaster, who once staffed at Hit Factory in New York and worked with Billy Idol, The System and Hall & Oates. In the six years he's been in Nashville, his projects have included all but one of Travis Tritt's records, Ricky Skaggs and fiddler Mark O'Connor. Feaster says his rates have remained relatively stable—around \$65 per hour—but that they are as flexible as those of the studios, thanks to the broad range of projects, from major recordings to demos and development projects. "Breaking in down here is pretty tough," he says. "But once you're in, it's the greatest place in the world to work. The studios

are a tightly knit community, as are the musicians and producers."

John Jaszcz (pronounced "Yosh") has been engineering in Nashville since 1991 after leaving Studio A in Dearborn Heights, Mich. In his work with artists like John Michael Montgomery, Tim McGraw and Joe Diffie, and producers like Scott Hendricks, Dan Cleary and Steve Keller, he's found a landscape that is technically more than sufficient and one that continues to expand, due partially to more studios opening up and also to the fact that it has become de rigueur for independent engineers to carry ever-increasing amounts of personal equipment. "If you haven't got a rack here, you don't work," says Jaszcz.

Jaszcz reports engineering rates of

—FROM PAGE 46, PRODUCTION ASSISTANTS

maintains that Soundstage, where she pays rent to lease an office, does not get any preferential treatment in client bookings. "Every producer works differently, and each has their own studio choices," she says.

From their perspective, Nashville's studio community is intimate. They have to negotiate with the studios, but despite the fact that part of their job includes keeping efficiency high, none says the rate negotiations are adversarial. "When I have the budget, I'll spend it," says Johnston. "Because I know I'll be back another time begging for freebies for development and demo projects. The studios help me out, but I'm careful that I don't broadcast what kinds of deals I get. But it's a serious help to the studio, as well. I'm not only booking time but also coordinating things like what time the drummer gets there for setup and whether they're acoustic or triggered drums, or both. It's gotten busy enough in Nashville so that the studio managers appreciate this kind of service as much as the producers do."

Koch negotiates rates as well but says that her primary fiduciary allegiance is to the producer and the record label, not the studio. In fact, to maintain a track record she says has never once al-

lowed a recording project to go over budget, she'll even go to Ampex's office on the Row and buy the tape herself. "I base my business on the fact that efficient planning and scheduling pays off for everyone," she asserts. "Most of the money lost in recording budgets is lost through disorganization. But I'm not out to beat anybody up on rates. You just do the best you can with a budget."

"The advantage to studio owners is that we can communicate things a lot more effectively since it's all focused on one source: us," Johnson says. When negotiating with studios, she acknowledges that she'll look for advantages, such as picking up canceled time on short notice for lower-budget projects. "That's an advantage the studios have, though. Even though one of my clients, Paul Worley, owns a studio [Money Pit], it's in such demand sometimes that he can't get into it. There are a lot of studios here, but the ones that are in demand can hold the line on rates to a higher degree."

The studio owners seem generally positive about the emergence of independent professional project coordinators. "They fill a hole in a town where the producers have gotten much busier," observes Glenn Meadows of Masterfonics. "I like the idea," adds Michael Koreiba of

Soundstage. "You can call one person and sometimes get five producers taken care of. I hope we see more of it."

On another level, Lisa Roy, once a Los Angeles-area studio owner and former manager of Nashville's Masterfonics, opened Studio A, a booking and referral service, in Nashville earlier this year. Similar in nature to Time Capsule in New York and Ellis Sorkin's company in Los Angeles, Studio A seeks to supply Nashville studios with clients from out of town, as well as getting Nashville acts interested in facilities elsewhere. (She says any number of West Coast studios have voiced interest in getting country artists into their rooms.) Studio A charges a 10% commission on booked time from the studio.

"I'm on Nashville's side," Roy says. "What I'm doing to deal with rates is try to match studios to the budgets that artists bring to me, not the other way around. I don't want to force an issue on rates." What she sees changing among the Nashville studio corps is an enhanced awareness of what she calls "the vibe" of a facility. "Anyone can go buy great equipment," she says. "The idea of full service is equally important in bringing in clients from outside Nashville."

—Dan Daley



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between \$750 to \$800 per day for tracking and mixing on country projects, with overdub sessions going for about three-fifths of that. On contemporary Christian records engineers are getting about 20 percent less overall. "The Christian projects are where the racks really come into play, since their budgets don't allow for the expensive rooms with extensive outboard," explains Jaszc. "But even a producer like Scott [Hendricks], who was an engineer and still carries around a lot of his own gear, expects his engineers to have a lot of their own, too." Jaszc also notes the increase in the number of dance remixes going on in country, which has attracted even more engineers to town, particularly those like Brian Tankersly (the seminal "Boot Scootin' Boogie" remix), who have backgrounds engineering urban contemporary music. "But with all the engineers coming, there still seems to be enough work to go around," says Jaszc. "And there seems to be enough for the studios, too."

The overall picture appears to be rather healthy, particularly in light of the increasing number of pop acts coming to Nashville for its studios, engineers and musicians. However, the ability of that trend to sustain itself will have much to do with the long-term outlook for Nashville studios, as will the emerging generation of country producers as the genre moves further toward pop production values and becomes more exposed to personal recording environments.

Producers like Mike Lawler, who did Twister Alley's record and country dance club hit "Dance" for PolyGram mostly in his home studio, could be the template for a future that's moving away from the structure that has sustained Nashville for so long. Meanwhile, as Nashville struggles to define what country is or isn't, the studios move cautiously ahead and further into the same seas that their counterparts in New York and Los Angeles have been sailing for some time.

Dan Daley is Mix's East Coast editor.

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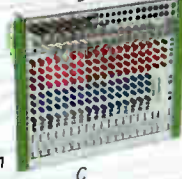
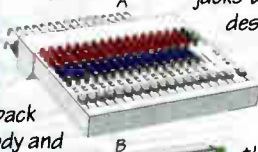
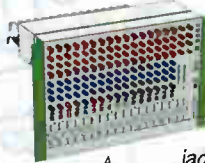
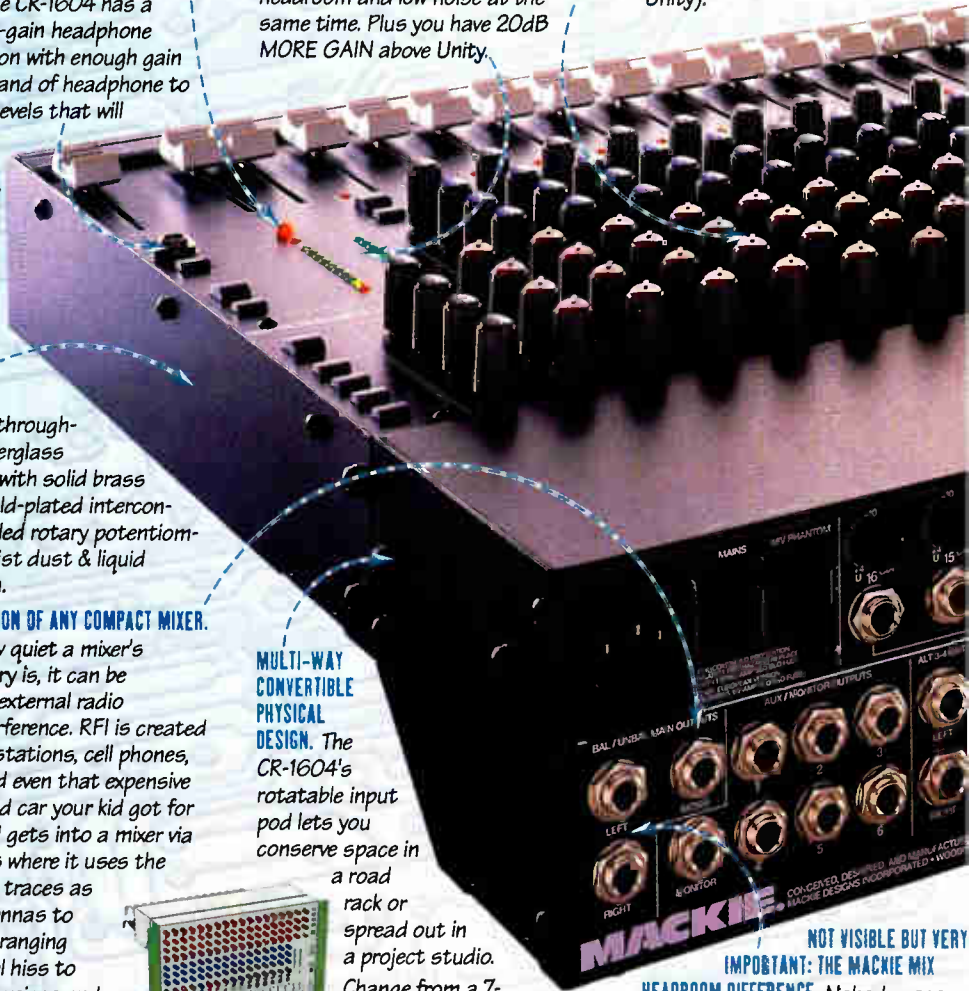
**DUAL PURPOSE METERING SYSTEM.** Besides showing main L/R output level, the LED ladders are used to establish input levels. Set a channel fader at Unity, press the channel's SOLO button and set input trim level. This approach achieves very high headroom and low noise at the same time. Plus you have 20dB MORE GAIN above Unity.

**INSTANT HANDS-ON-ACCESS** to constant power pan controls, musical 3-band equalization, ALT 3/4 extra stereo bus, stereo in-place solo, seven high gain Aux sends per channel (via four controls) and four high gain stereo Aux returns (20dB more gain above Unity).

**MULTI-WAY CONVERTIBLE PHYSICAL DESIGN.** The CR-1604's rotatable input pod lets you conserve space in a road rack or spread out in a project studio.

Change from a 7-rack-space mixer with jacks to back (A) to a tabletop design with jacks to top (B) in minutes. Add our optional RotoPod bracket (C) and rotate inputs and outputs to the same plane as the mixer's controls (a favorite for small SR set-ups). Any of these conversions takes just minutes with a Phillips-head screwdriver. And our XLR10 10-mic-preamp expander can be added in any of the configurations.

**NOT VISIBLE BUT VERY IMPORTANT: THE MACKIE MIX HEADROOM DIFFERENCE.** Nobody uses just one channel of a mixer (although most headroom specs are stated that way). In any mixer, the mix amp stage combines signals from ALL inputs at once. If it overloads, you can't back off the master fader because it comes AFTER the the mix amp. So audible distortion results when the mix amp gets bogged down with multiple hot inputs. Mackie's unique mix amp architecture provides as much as twice the mix headroom of conventional designs. No wonder it's a favorite of top electronic percussionists.





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**MUSICAL 3-BAND EQUALIZATION.** The CR-1604 redefined equalization points for compact mixers: 12kHz Hi EQ (instead of 10kHz) for more sizzle and less aural fatigue, 2.5kHz Mid (vs. 1kHz) for better control of vocals and instrumental harmonics, and 80Hz Lo EQ (instead of 100Hz) for more depth and less "bonk." Others have copied these EQ points, but none have successfully emulated our quality equalization circuitry. It costs us more, but the result is zero

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Instead of sixteen "acceptable" integrated circuit microphone preamps, the CR-1604 features six big-console-quality preamps...the same mic preamp design that's on our acclaimed 8•Bus consoles. You get tremendous headroom and bandwidth with less noise and distortion. If your particular application requires more mic inputs, simply add our XLR10 10-Mic-Preamp Expander. Both it and the CR-1604's internal mic preamps have real and verifiable specs of -129.5 dBm E.I.N., 300,000Hz bandwidth and 0.005% THD. No wonder several of the world's top microphone manufacturers use Mackie Designs CR-1604s to demo their finest condenser mics at trade shows.

**INPUTS AND OUTPUTS AT PROFESSIONAL — NOT HOBBYIST — SIGNAL LEVELS.** The CR-1604 operates internally at industry-standard +4dBu levels to help reduce noise. But it can also handle the weaker -10dBV levels found on some digital multitrack machines and other equipment.

**THE PERFECT MATCH FOR ADATs, DA-88s AND HARD DISK RECORDING SYSTEMS.** We'd dearly love for you to buy one of our 8•Bus line consoles, but the CR-1604 makes a very effective 8-track recording mixer. The CR-1604's eight channels have post-fader channel inserts (channel access), this VERY important feature is found on few other compact mixers. It lets you create a "split console" that you can simultaneously track on eight channels and monitor/mixdown on eight more.

**EXPANDABILITY.** If you add a second or third digital multitrack, you can use one or two additional CR-1604s with our MixerMixer active combiner. It lets you run 32 or 48 channels without having to "cascade" multiple mixers.

<sup>1</sup>This is no idle boast. Consider these tours for starters: Madonna, Rolling Stones, Boyz II Men, Whitney Houston, INXS, Janet Jackson, Peter Gabriel, Bette Midler, Bruce Springsteen, Paula Abdul and Moody Blues. Mention in this list denotes useage by band members or tour techs and in no way constitutes an endorsement by the artists mentioned.

<sup>2</sup>More fine print. Mention in this ad denotes useage as reported to Mackie Designs and in no way denotes endorsement by the artist, program or production company listed.

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by Dan Daley

# YES, VIRGINIA, THERE STILL ARE DEMO STUDIOS

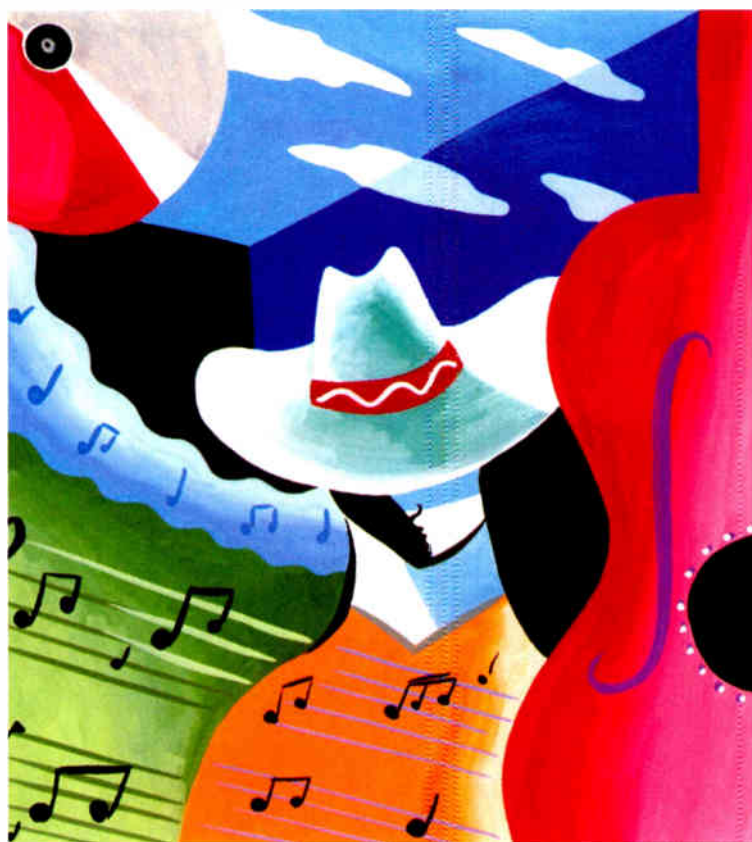
**W**hen project studio technology came along in force in the mid-'80s, it initiated and propelled a sea change in the client bases of many mid-sized and small recording facilities. Publishing demo sessions, which had become the grout that filled in between the main tiles of master record bookings, virtually disappeared. An investment equal to the cost of three or four studio sessions gave musicians and writers access to unlimited studio time.

The rise of independently produced and released records—we're living in a renaissance of them at the moment, the likes of which hasn't been seen since early rock 'n' roll releases in the mid-1950s—has helped fill in for the erosion of demos from commercial studio booking logs. But that's still not replacing the volume of song demos that used to be seen, at least in most major urban areas; certainly the mid-sized studio in smaller communities still functions as the general store. But in New York, Los Angeles, Chicago and other metropolises, demos are—literally—in-house productions for the most part.

The notable exception is Nashville, where a handful of studios straddle the otherwise clearly marked line between project studio and commercial facility. They're project studios in that they're owner-operated, generally rely on the musicianship/programming/engineering/production skills of the owners, and

provide billing on a project, not component, basis; yet they're for-hire facilities in the sense that you can book the studios as simply studios, with your own producers, engineers, programmers and musicians, for hourly or daily rates.

This hybrid is perhaps only possi-



ble in a place like Nashville, where the sheer number of songs written and consumed in country music far exceeds that of any other genre. Despite the fact that more country artists are also writers these days, the traditional separation between com-

ILLUSTRATION HEIDI YOUNGER



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and my accountant  
almost broke into  
a smile ”

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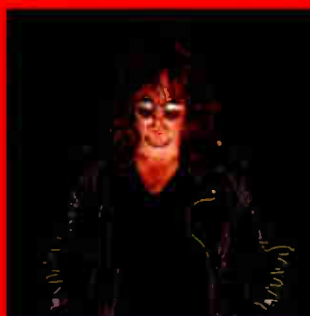
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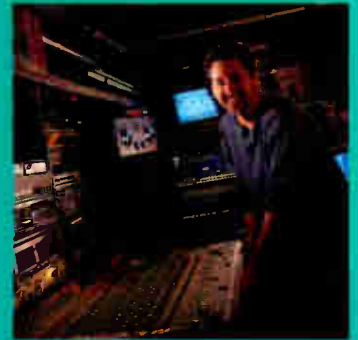
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World Radio History



poser and recording artist is more present here still than anywhere else. And with the summer NAMM show in Nashville again this year, it's appropriate to focus on this unique example of how musicians became studio owners.

The paradigm of this scenario is perhaps County Q, a three-room facility in the township of Berry Hill within Nashville's Davidson County. Featuring a bastardized Trident Series 70 with Yamaha and Tannoy near-fields perched atop it, Sound Workshop and Mackie consoles, and vintage MCI JH-16 and JH-24 and more recent Tascam ATR-24 multitrack machines, County Q runs the technical gamut from typical project studio to slightly eccentric for-hire facility. And that's essentially what it is, says co-owner Scot Merry.

However, he adds, County Q is as much a concept as it is a facility: Merry—a bassist, along with partner and drummer Paul Scholten—came to Nashville in 1989 with an 8-track deck, a souvenir of years together on the road as the rhythm section for a

band in the Midwest. They thought they could use the 8-track as "bait" to attract another band. "It took us about a month to see how stupid

**This hybrid is perhaps only possible in a place like Nashville, where the sheer number of songs written and consumed in country music far exceeds that of any other genre.**

that was," Merry recalls. "And if you told me in 1985 that we would end up owning a 24-track, three-room recording studio in a place like Nashville, which already had so many studios, I'd have said you were crazy."

What the 8-track did attract was hordes of songwriters looking for demos as the quality floor for that commodity started going up in the wake of records like Randy Travis' *Songs Of Life*, which combined a return to lyrical values with Kyle Lehn-ing's engineer-trained production approach. Merry and Scholten started doing demos for free, then for \$40 per song, all along honing an approach that combined efficiency—like arranging the songs and choosing and booking the musicians—with a familial ambience that songwriters responded to, and a simple, direct billing process that publishers liked. They played, provided engineering and production assistance, and came up with an economically feasible arrangement for the publishers. Yet the studio was, and is, for hire for those who wanted it.

By definition, the project studio owner is hired for projects: the project studio itself is transparent to the client. Commercial facilities, on the other hand, are generally defined more by their space and technology than by their ownership. "So what is County Q?" Merry asks himself rhe-

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**PROJECT VIEW**

torically. "We're trying to be Motown, in a way. In fact, we call it MooTown [he laughs]. It's a project studio that sells itself based on its production and organizational skills. Nashville is a place that needs to have space for a band to record, whether it's a demo or a master. The live band is still king in Nashville. So it's also a regular studio in that respect."

**HANK'S HERE SOMEWHERE**

"Salty" Miller, owner of Music Machine at the meeting of Music Row and Division Street in Nashville, found that his childhood nickname stuck after a long tenure as a roving executive for Green Sea Ltd., a venture capital corporation based in the Caribbean West Indies. That came in the wake of Miller's leaving the music business in frustration at industry corruption after a stint as a guitarist in The Monzas, an act that charted a Top Ten single in the mid-'60s on Sceptre Records. But the lure of recording brought him back in 1994, with Green Sea as the financier, to open Music Machine, a studio that also incorporates part of Hank Williams Sr.'s house, which was moved years ago to Music Row in an abortive attempt to make it a museum by Williams' wife Audrey.

Today, Miller's ancillary ventures—two publishing companies and a production company—outnumber the studio itself three-to-one. As with County Q (which also has a publishing company), Music Machine's approach is to provide one-stop service to songwriters and, occasionally, recording artists, as a counterweight to an environment that Miller feels has grown too corporate and that stunts creative growth. Unlike either most commercial or project studios, Music Machine has both staff engineers (three) and staff producers (two), and actively solicits interests in the publishing of songs that writers bring by for demoing—offering song pitching and other publishers' inducements in return. In this sense, Music Machine is a project studio as the ultimate tool: a means of production that serves as the means to a larger result.

The studio operates five Tascam DA-88 MDMs through an extended 56-input Mackie console and Tannoy monitoring. Aside from some record label work and a recent audio-for-

film project entitled "Houston," the bulk of Music Machine's work has been song demos. "The focus on the song is a bit more intense here," says Miller; in addition to arrangement and production assistance, his staff also offers what Nashville writers call "song surgery" on lyrics and melodies.

Both studios operate under the local economics of between \$300 to \$500 per song for publishing demos, inclusive of tape, musicians, studio time, etc., that publishers seem willing to pay. Miller is ambivalent as to which rubric Music Machine falls under—project or for-hire facility: "I don't feel pulled either way," he says. "It's kind of like a mining operation. We use it as an opportunity to look for opportunities."

Merry is not at all offended when County Q is referred to as a music mill; quite the opposite actually, priding the operation on its ability to feed the voracious Nashville appetite for songs and do it with quality and sensitivity. And that, he adds, has a lot to do with having studio ownership as a musician. "It's a sort of factory approach, but it's also efficient and works well for the musicians, the writers and the engineers," says Merry. "Tracking, vocals and mixing are the basics of demos—three tasks, three studios. One studio is tracking while another is doing overdubs and the third is mixing." And as for mastering, County Q added a Pro Tools system in conjunction with engineer Tom Endres to try to develop a mastering business, both to raise the quality level of demos and as a secondary source of revenue.

But, according to Merry, the main profit center remains demos, as it does for Music Machine. And that's a fairly amazing situation in an age when everyone thinks that song demos have retreated to living rooms, bedrooms and garages everywhere else. "Look," Merry offers. "This is truly a musicians' way of doing things. For all the musicians who started project studios in their homes, there's plenty who realized to themselves after a while, 'Hey, I'm not playing guitar anymore; I'm spending all my time surrounded by wires under my console.'" ■

*Dan Daley is Mix's East Coast editor. He underestimated Nashville's technology base—his Webcor/Wollensak project studio has not done as well as anticipated.*



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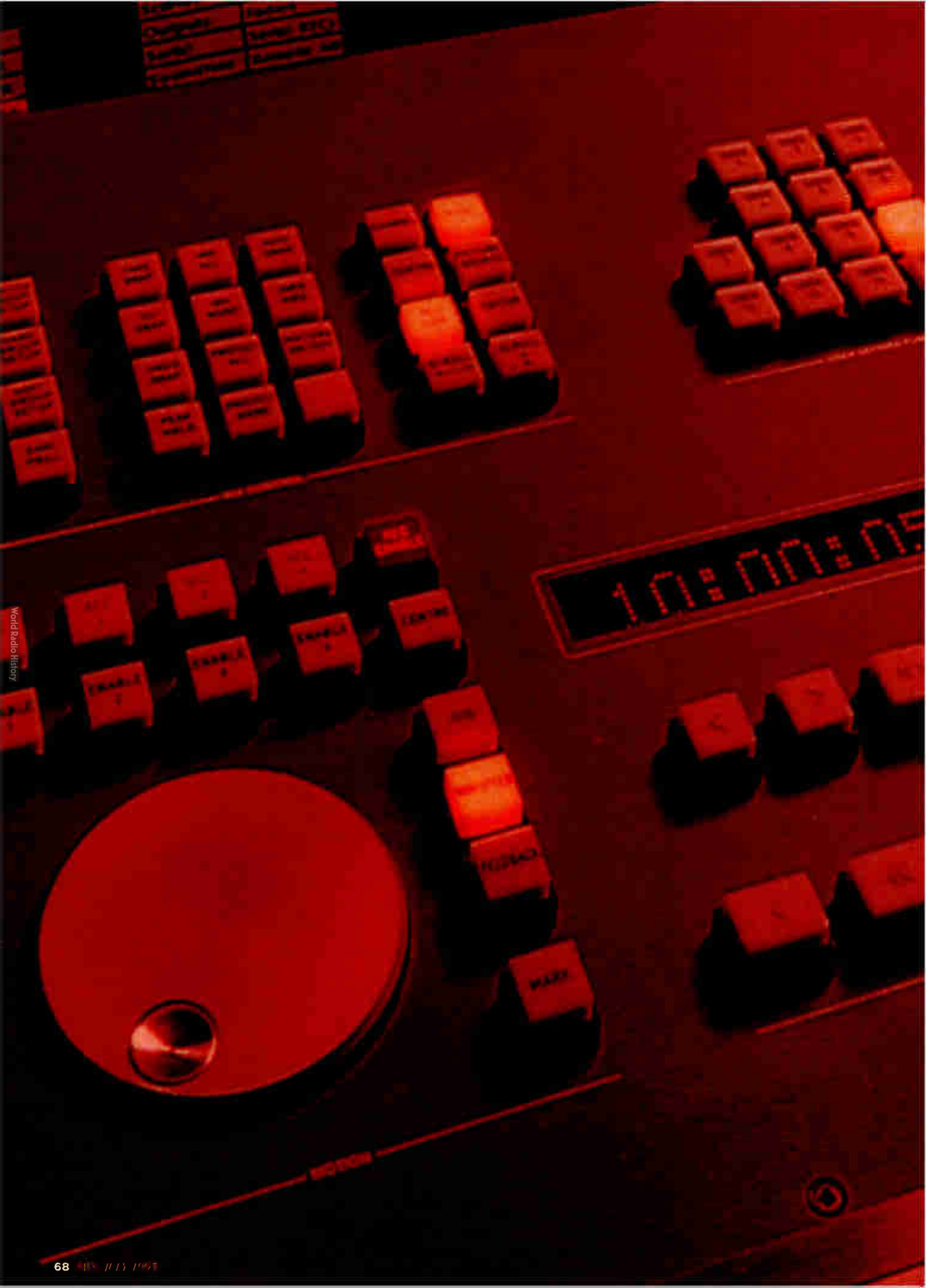
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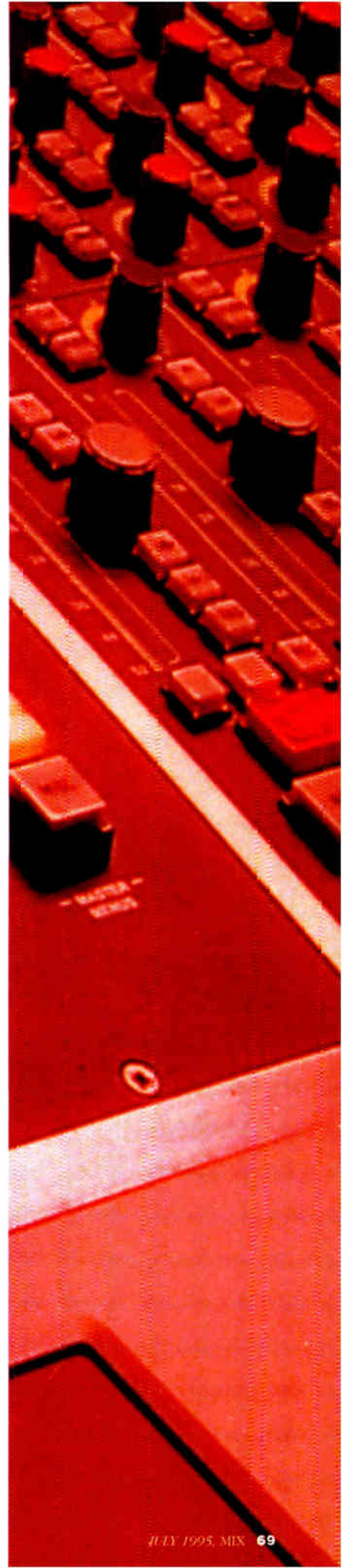
# RECORDING Consoles

**PAST, PRESENT AND FUTURE**

The evolution of the modern recording console has taken a rather circuitous route over the past 50 years. Everybody likes to talk about the “good old days,” but I doubt that many of us really want to return to the era when the equivalent of \$50,000 (in today’s currency) bought a custom-built, 10-input, rotary fader unit with no subgroups, a single echo send and 2-band EQ. And referring to the crude filter sections on an early console as “equalization” is laughable: Just relabel those bass and treble controls to read “rumble” and “hiss,” and you’ll take a giant step closer to appreciating modern equalizer designs.

Maintenance on those Bakelite-knobbed behemoths was no picnic, either: Proper warm-up time was approximately half an hour, tubes needed constant replacing, and the faders—if there were any—required regularly scheduled lubrication sessions. Anyone who still remembers “fader grease” has little reason to recall antique electronics with any particular fondness.

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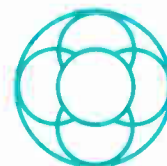
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But technology marches on. Tubes begat transistors, which begat integrated circuits, which begat VLSI-driven DSP designs, which someday will begat something else. Of course, at each step, designers offered hybrid stages that combined the new and the old. And along the way, the proponents of the new wave put down the stage immediately preceding it with the marketing fury of a tornado. These days, digital is hip, discrete is cool, and tubes are the rage: ICs are unfashionable. Who can say what the next step will be? But one thing is clear: Audio engineers are no longer bound to a single design approach when it comes to console selection. And as with the fashion world's offerings in hemlines or lapel widths, the single, accepted standard in console design and topology no longer exists. Diversity is the name of the game.

Today, with dozens of console manufacturers worldwide, customers can find just about anything they want. At last year's APRS show, London-based Tony Larking Audio unveiled a large-scale, tube-based 24-channel recording console featuring a flexible, ergonomically modern topology that was distinctly analog.

At the other end of the spectrum are the powerful, high-end DSP-based designs, such as the Neve Capricorn, AMS Logic Series, Solid State Logic Axiom and Sony DMX Series, all of which have been covered in detail in these pages. The advantages of all-digital production are clear: Once in the digital domain, the audio signals can stay digital, free of the redundant conversions inherent in combining a digital multitrack with an analog console.

For example, when you record to digital, the audio makes one A/D conversion to get onto tape (or hard disk). To use an analog console to mix that same source material, a D/A step gets you into the analog board, but any digital signal processing—such as reverb—will require another pair of A/D and D/A conversions to get into and out of the processor, and then another A/D conversion before going to DAT. This requires a

minimum of four redundant conversion steps (the number, of course, increases with each additional DSP device used during the mix).

The decision of going with an analog or digital console is clearly not an easy one for owners of commercial facilities. If you buy analog, are you buying into obsolescence? Or if you go digital, are you making an early buy into unproven technology? There are no simple answers, but the approach offered by the AT&T DISQ system offers an interesting solution. A standard analog console—i.e., Solid State Logic, Harrison or Neve—becomes the controller for the AT&T Digital Mixer Core (an outboard rack incorporating all the necessary I/O and DSP hardware), offering users the choice of mixing on the console's analog electronics or using the console's familiar topology to control the outboard DSP hardware.

## The single accepted standard in console design and topology no longer exists. Diversity is the name of the game.

What's becoming more common these days is the emergence of combination workstation/mixer units. Systems such as the Studer Dyaxis Postrio or Solid State Logic's Scenaria offer recording, editing and mixing functions, although neither product comes to mind first when we think about consoles. However, SSL's Axiom goes one step further in blurring the distinction between mixer and workstation: Offering traditional console functions in a large-frame (48- to 96-channel) package, Axiom also features internal signal processing (EQ, dynamics, reverb and delay), LCRSS and stereo bussing, and comprehensive automation of all console and DSP functions with single-keystroke reset. So far, Axiom fits the definition of a modern digital console, but its DiskTrack feature, a disk-based recording/editing system,

with up to 95 simultaneous channels and multiconsole access to central I/O and hard disk resources, takes it into another realm.

All-digital consoles are no longer the unaffordable dream. Slated for October delivery is Yamaha's 02XR, a digital 8-bus console targeted at under \$10,000. Housed in a 3x2.5-foot tabletop chassis, the 24x16x8x2 mixer has 16 mic/line inputs, four stereo line inputs, eight groups (output buses), stereo output bus and 16 tape returns that double as inputs, for up to 40 input signals. Standard features include 100mm moving faders, eight digital tape inputs/outputs—ADAT, Tascam TDIF-1 or AES/EBU—with card slots for additional digital I/Os, two onboard effects processors, eight aux sends, dynamics on all inputs and outputs, 4-band parametric EQ. All console functions can be automated to SMPTE or MTC.

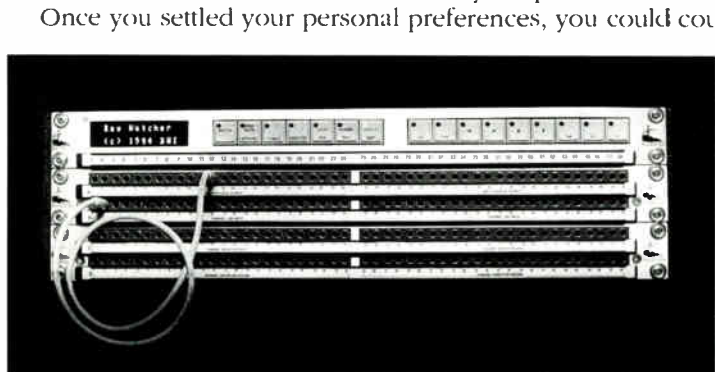
Another affordable digital console is RSP Technologies Project X, a large-format board with direct interfacing with ADATs or DA-88s. Its desktop surface resembles a traditional console and controls all audio and DSP functions in a separate rack. Standard features include recall of all console settings, dynamic SMPTE-based automation (faders, mutes, pans, auxes, effects, etc.) and central control of all operations. On-board DSP includes 4-band EQ, delay, dynamics and reverb/multieffects. A 32x16 system (expandable to 64x24x2) is expected to cost in the \$30,000 range. Deliveries begin this fall.

From the standpoint of control flexibility, digitally controlled analog designs offer the best of both worlds: analog affordability with instantaneous control. The Euphonix CS2000, Harrison Series 12, Otari Concept I and Tactile Technologies M4000 are examples of such consoles. While each is substantially different in their approach to analog design, they all share the ability to control critical console functions—such as equalization and routing—from a centralized location. There's no need to reach out of the listening "sweet spot," even if you're tweaking the kick drum EQ (Fader #1) on a 96-input console. And with an almost inexhaustible number of snapshot presets available, the digitally controlled analog console can suddenly appear exactly as you left it on that half-finished mix from two weeks ago. Ad-

—CONTINUED ON PAGE 73

# Signal Routing Solutions

Decisions regarding studio patchbays used to be a fairly simple proposition. Did you want an onboard or external unit? Balanced or unbalanced? Tiny telephone (TT) or 1/8-inch?



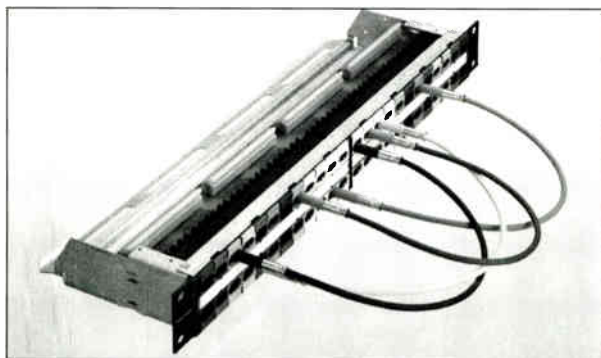
**BayWatcher**

ment of 1/8-inch and XLR connections (linked to audio tielines in the main patchbay), as well as MIDI and SMPTE connections. I always appreciate its versatility when someone comes in and wants to connect a rack of MIDI instruments or outboard gear at the last moment. Extra space in the patchbay is a luxury anybody can afford.

Having settled on the type of patchbay you need, it's time to look at the rear panel. The simplest patchbays have 1/8-inch or RCA jacks on the front and back panels, so installation usually involves little more than connecting the gear to the back panel. Many of these, such as units from Ace Products, dbx or Furman, also include internal jumpers or other methods for setting individual channels from normaled to non-normaled operation. Outboard TT patchbays may terminate with rear TT jacks but more commonly are fitted with either punch-block, solder or multipin connectors.

Once you've gone beyond the basic 1/8-inch or RCA connections, you'll discover that patchbay wiring/installation is complex and/or difficult, and is probably best left to an expert. Fortunately, there are dozens of companies that can fabricate custom wiring harnesses to seamlessly integrate patchbay systems with your studio gear.

A novel approach to patchbays is the BayWatcher patchbay monitor and recall system from BayWatcher Inc. of Canoga Park, Calif. A stand-alone system for monitoring and recording patches, the product monitors each patch as the user makes it and automatically stores the



**Neutrik Easy Patch**

patch information. A Re-Patch function recalls patch info and prompts the user through repatching with LEDs at each jack.

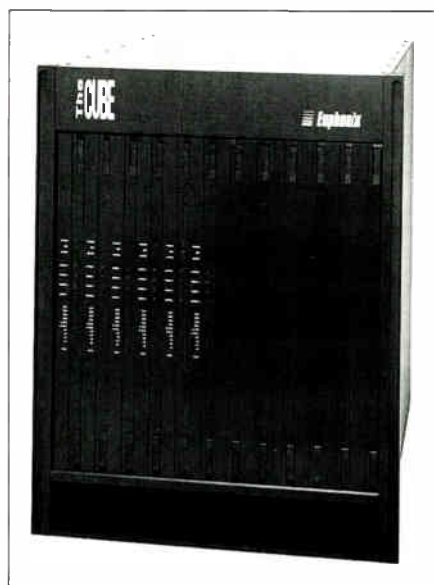
Harrison has implemented programmable switching/routing functions into its Series 10B, MPC and Series 12 consoles. The system is essentially a crosspoint switching matrix, where up to 1,024 sources can be routed to 1,024 destinations for a total of 1,048,576 crosspoints. Actually, the router is set up with any number of 64x32 blocks, and a couple of these should handle most studio setups. Harrison also markets the ARS-9, a \$30,000 stand-alone routing switching system that can be used with any console. The ARS-9 is set up using 64-input or 32-output cards, with a maximum 256x256 configuration available.

Designed for use with Euphonix CSII or CS2000 consoles, The Cube is a computer-controlled routing matrix that can replace traditional patchbay functions or be fitted with DCAs to provide up to 48 auxiliary sends. Compatible with Euphonix's SnapShot Recall automation, other applications for The Cube include I/O crosspoint switching, multichannel film mix buses or broadcast mix-minus matrixing.

—George Petersen

Once you settled your personal preferences, you could count up your requirements in terms of inputs, outputs, tracks, sends, returns, outboard gear, tielines and auxiliary devices. And the wise operator always included plans for a dose of future expansion in patchbay requirements; after all, new equipment is always coming in, and you can never seem to retire enough older gear to make room for new arrivals.

An ample-sized patchbay can really make life easier. In my facility, we have a 300-point bay in the console and auxiliary patchbays with another 288 points. We also have what we call a "guest" patchbay built into the producer's desk area of the console. The guest patchbay is actually a panel with an assort-



**The Cube**

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—FROM PAGE 71, CONSOLES

ditionally, assignable faders and soft-keys allow users to personalize the console to their own way of working, rather than conforming a style to fit the particular piece of hardware.

With its new series of CS2000 models, Euphonix has taken the digitally controlled analog approach to its next logical step. The company now offers various versions—each with relatively minor hardware differences but substantially different software packages to meet application-specific needs. The CS2000M is designed for music production; the CS2000P for post-production; the CS2000B for broadcast; the CS2000F for film dubbing; and so on.

Whether a console is all-digital, digitally controlled analog or a more traditional digital approach, new formats (LCRS, LCR/LS/RS, Dolby Stereo, Dolby SR+D digital, DTS, Sony SDDS) present new challenges to the console designer. New formats are often dictated by the film/post-production community, although changes such as the emergence of surround-sound releases into audio CDs and studios diversifying into new markets have increased the demand for more complex consoles. Film consoles—particularly multi-operator systems—are a specialized and quite finite market, but among those consoles catering to more general post-production tasks are the Euphonix CS2000P, Neve VRP, Solid State Logic SL-8000, Otari Premiere, Lafont Chroma and Harrison Series 12.

So are you out of luck if you suddenly need the flexibility of a post console? Not necessarily. Some manufacturers—although certainly not all—offer retrofit packages, such as D&R's LCRS panning option for its Orion console. Harrison's Octapan is an 8-channel automated panning system that supports up to eight faders for multichannel mix formats. The system includes eight trackball panners with LED positional indicators and an interactive video graphics interface. Standard on all Harrison Series 12 and MPC film consoles, Octapan is also available for retrofit into other consoles or as a stand-alone

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unit. A new development from Otari is PicMix. Priced from \$4,000, PicMix brings full film mix monitoring flexibility to any studio console. Up to six dual-input panner modules (controllable from joysticks) can be added to the system and set for LCRS, LRS, LCRSS or custom panning. The system is compatible with Dolby Stereo,

Dolby Digital (SR•D), DTS and Sony SDDS and can be interfaced with most console automation or MIDI sequencers.

Before deciding to replace an older console, consider sprucing it up—either with a total overhaul or by adding functionality, such as an automation system. Such a move may make a great deal of financial sense, and a wide variety of automation packages, ranging from simple outboard units to PC-driven VCA or moving faders, are available in every price category. As an alternative, a few of the lower-priced automated consoles

in the \$25,000-plus price range—such as the Soundcraft DC2000 or the Soundtracs Solitaire—can be fitted with moving faders and may be priced (including console!) at less than what some moving fader systems alone would sell for.


Speaking of pricing, the intense competition in the small-format, 8-bus console front may drive manufacturers insane, but end-users do benefit. Ten years ago, a lower-end 32x8 recording board with a “split” 24-track monitoring section sold in the \$20,000-plus range. Today, similarly configured 8-bus boards start for a quarter of that amount, and most are in-line designs offering 56, 64 or more inputs in Remix mode. Many also offer automation packages, either MIDI-based snapshot muting or more versatile VCA fader options. Last year, the race was intense in the 8-bus category; this year the competition is in affordable 4-bus designs.

So where is console design heading? By extracting a small portion from each of the above examples, it's possible to do some creative interpolating and come up with an answer. Once we traverse beyond that intermediate phase of digital/analog hybrids, the console of the future is clearly digital, with extensive software control that allows users to shape the board into what they need. And you can bet that integrated, full-function DSP (reverb, effects, etc.) will factor heavily in digital designs.

As onscreen, digital-domain mixing becomes a more or less standard feature on most digital audio workstations, it is clear that the number-crunching capacity of modern computers is well up to the task of handling limited digital mixing chores. So as the price of memory and processor power continues on its downward spiral, will the next console you buy be a piece of software? It's an interesting concept, but time and time again, users have supported the idea of some kind of tangible hardware device or controller to translate the ideas from our minds and hands into the datastreams that instruct machines to do our bidding. And to be successful, that controller must have a nice “feel,” because as surely as we kick the tires at a used car lot, the first thing anyone does when checking out a console is to move the faders. ■

*George Petersen is editor of Mix.*

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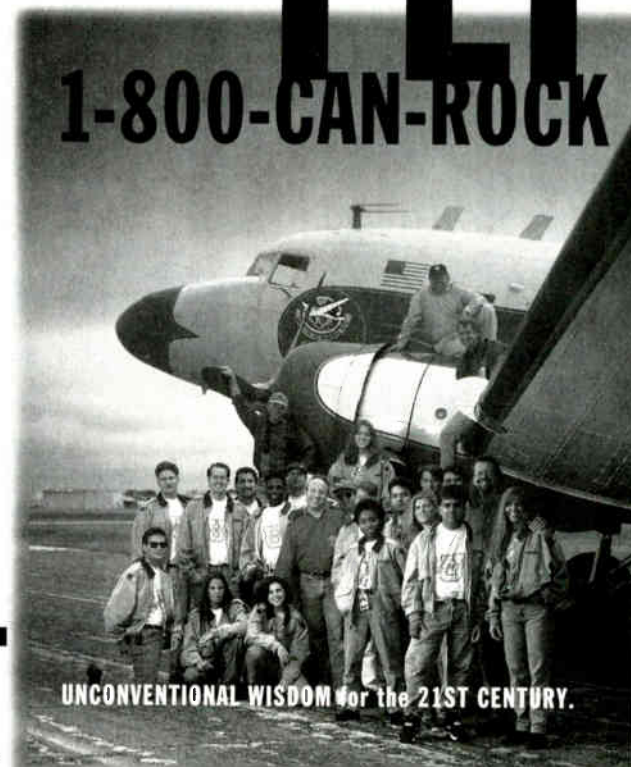


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## Nine Vignettes From The World of Live Recording and Broadcast

Things are looking rosy indeed in the live recording business these days. There are more music programs on radio and television, more performers using remote recording services for out-of-studio projects, more bands at every level recording shows and tours for either albums or archival purposes. And then there's the modular digital multitrack revolution, which has made live recording even more affordable for many, but which some high-end remote players have so far eschewed. In preparing this year's live recording article, we contacted a varied group of engineers—some of whom work with remote operations, others who are independent recordists—to find out what's going on out on the road.

### THAT OL' GOSPEL FEELING

Mobile Audio Recording Services, of Dallas, is a carryover from Omega Productions: Last fall, Steve Lowney, a seven-year Omega veteran, and Julie Haldeman, a four-year vet, purchased the Omega truck, with its API 32x32 console (augmented by a Mackie 32x8 "for auxiliary support to increase the inputs") and Otari MTR-90 24-track. Lowney and his staff have been busy ever since with a wide variety of jobs, ranging from gospel dates in St. Louis, Chicago and Mississippi to the Tejano Music Awards in San Antonio, and many jobs in between. Because Mobile Audio does so much gospel work, I thought it would be interesting to learn how Lowney deals with that all-important element—the crowd. After all, the audience at a gospel concert (or church service) is always an integral part of the recording.

Lowney has worked extensively with the highly regarded Mississippi Mass Choir, and recently, he handled an album/video date with the Grammy-nominated Canton Spirituals in Memphis for Blackberry Records. "With these kinds of projects," Lowney says, "you're going to get bleed. You can't fight bleed, so you try



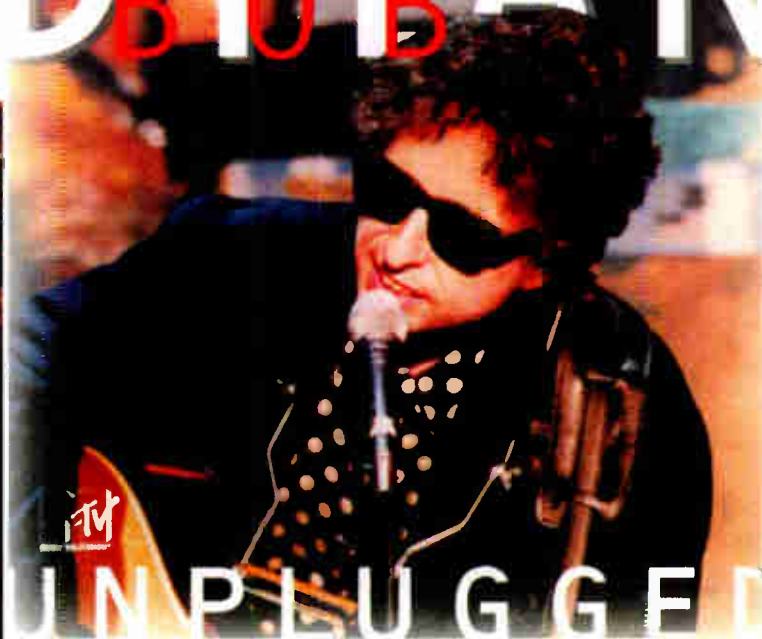
*Dwight Yoakam's new live album*

BY BLAIR JACKSON





# DYOBAN



*Kooster McAllister's  
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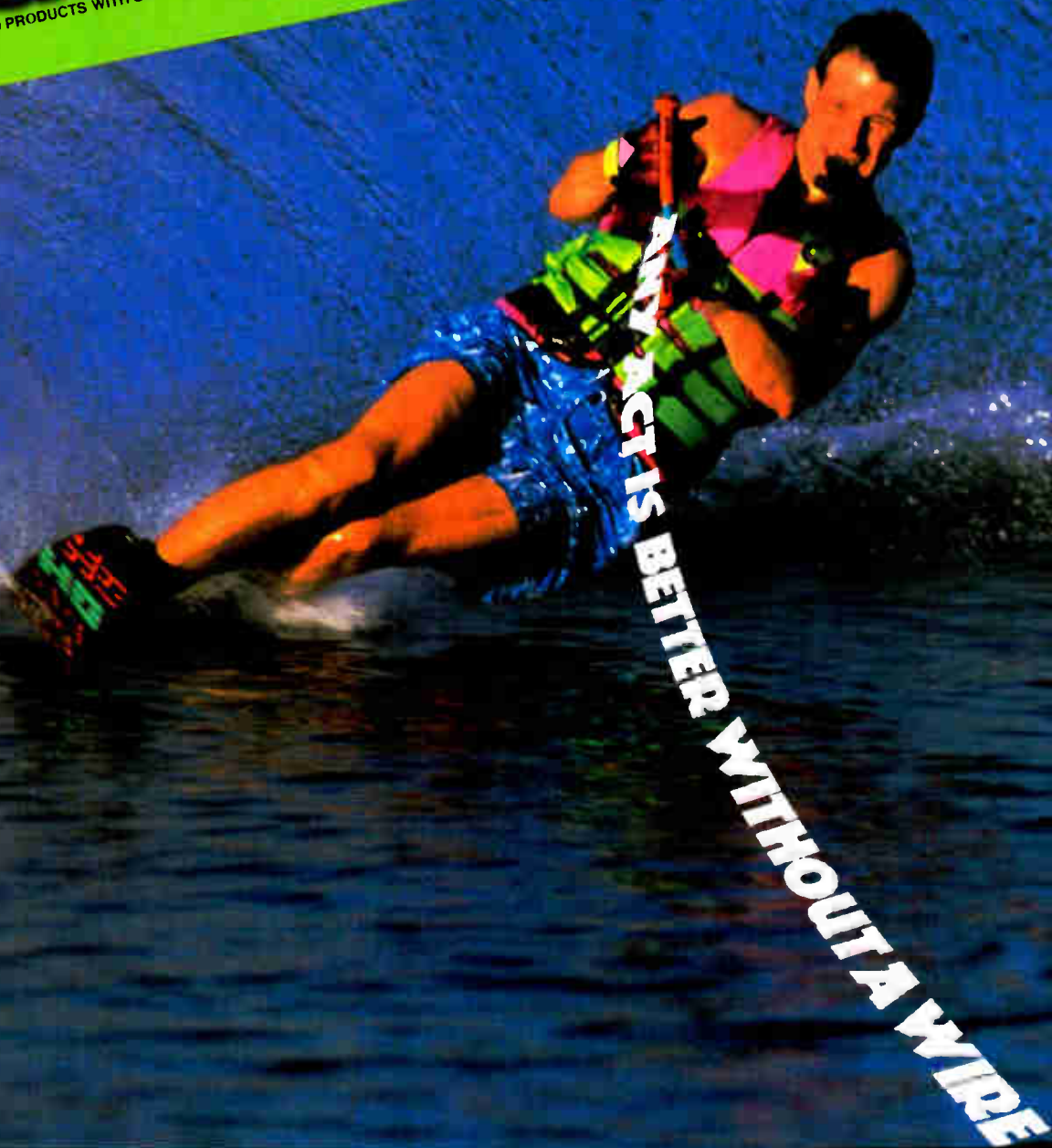
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to make it work for you. You're going to get drum bleed in choir mics; that's just the nature of the biz. You're going to hear the audience, and that's fine, too, especially when you're also doing a video.

"What we do, specifically for the audience, is we hang anywhere from six to eight mics, depending on the venue," he explains, "and then we bring that up underneath the mix and use that in place of a lot of artificial effects devices. We use a variety of mics. For room mics we might use a Sony stereo mic or a couple of 451s as a stereo pair in the center, a couple of 414s on the side or SM81s. I've used 441s on the audience; it depends on the room. I've used PZMs. What I try to do is keep the audience mics on a plane with the speaker stacks, where I'm not out too much in front and there's a nice little dead spot right out in front of the stage, in front of the monitors and behind the stacks, and you get real good audience response there."

On the choir itself, Lowney says that "lately I've been bringing up mics over the back—using 441s to augment the track. It gives it a nice full sound." The Mass Choir additionally uses three solo mics—Shure 58s and Beta 87s: "Both are fantastic for this kind of music, and the sound reinforcement guys love 'em," Lowney says. Typically, MMC dates use about 40 inputs for the choir, soloists, rhythm section and audience. Lowney tracks the dates, and then they are mixed at Malaco. "These singers will just blow you off the stage," Lowney says of the choir. "They're absolutely incredible!"



Steve Lowney of Dallas-based MARS

#### DEEP IN THE HOUSE OF BLUES

Sheffield Audio/Video Productions of Phoenix, Md., is enjoying one of its best years ever. Owner Richard Van Horn estimates that by year's end, his truck will have been out for more than 200 days, including stints re-



Tom Size and Garth Michael in Sheffield remote truck during an Aerosmith live broadcast

cording the theatrical metal band Gwar ("at this place in Virginia known as The Slave Pit, which Gwar owns," Van Horn says), various Black Entertainment Television specials, the Boston Pops and, most lucrative of all, shows for the syndicated *House of Blues* TV series. Incidentally, Van Horn says that he plans to build another big truck next year.

The *House of Blues* program has been shot at both the New Orleans and Los Angeles clubs of the same name, and Sheffield has used two trucks to capture the audio. In New Orleans, their own remote unit, equipped with Sony 3324 digital recorders and an SSL and small Neve consoles; and in L.A., Le Mobile's truck, with its Otari Studer multitrack recorders (with Dolby SR) and Neve 8058 console. Northern California-based engineer Tom Size, who has worked with Sheffield on a forthcoming Aerosmith live album, is the principal engineer for the broadcasts.

"Both clubs are fairly easy to work with," Size says. "The power is together, the stages are cool and the sound is good in the clubs." At one point in the spring, Size worked on eight shows in a two-week period. The program has offered a wide-ranging menu of bands, including the Dave Matthews Band, Joe Jackson, Blues Traveler, Take 6, Little Texas, Tom Jones and the Allman Brothers, to name just a few.

Size says that before each taping, he makes a point of getting in touch with the band's FOH mixer to com-

pare notes. "Also, if I don't know the music, I need to kind of brush up on it," he explains. "I like to know what kind of sounds they're going for, whether it's a big drum sound or a tight drum sound or they're mainly acoustic or whatever." He notes that he'll usually have his own ideas about what mics might work best for a given group, "but a lot of times the mixer doesn't want to budge. He'll say, 'We like *this* on the snare,' or 'We have this kind of endorsement so we have to use this microphone.' Fortunately, it's usually pretty good stuff, so it's not a problem. I can work with almost anything." Size hangs six room mics: "Sennheiser shotguns for the floor and up close, and [AKG] 460s to fill it out, put in the different balconies and whatnot." In the Sheffield truck, Size likes to put the drums through the Neve console and everything else through the SSL.

The show is mixed-to-picture at Sheffield in Maryland by Fred Derby, but, Size says, "I try to nail the mix as much as I can. My rough mixes are usually about three-quarters, if not all the way, there. Of course, what I give them usually gets mixed a little different for TV, sort of from the camera's perspective. If the camera's on the keyboard player, they might turn that up to match the visual. Personally, I think the music should come first and picture should support the music, but that's just my view because I've done music my whole life. I just try to make it sound musical. I don't EQ it so it'll sound good on a

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little TV speaker. That's Freddy's job. I'm just there to record it right."

### ANOTHER LEGEND UNPLUGGED

At the other end of the phone line, Randy Ezratty of New York's Effanel Music is excited: "Increasingly, in addition to being a remote recording company, our personnel and systems are now branching off into live broadcast. We've built an installation to handle the music for *The Jon Stewart Show*, which has a little Neve discrete 24-channel broadcast console, and we go there every day and just mix a couple of songs and get out of there. That's really fun. Then right up the street from our shop, MTV has their studios, and we put in a room there, too. In addition to that, a lot of the MTV *Unplugged* shows are being done at Sony studios, but they're staffing it with us. Either John Harris or myself have done the last ten. We've fallen into a nice thing with them. We bring in our 52 Hardy mic pre's. They have SSLs in there—one room has an 8000, one has a 4000—but we go straight onto the 48-track machine from the mic pre's and then just do a monitor mix on the SSL. Sometimes, like for Melissa Etheridge, they use the monitor mix. What gets mixed for the records, though, is directly from the Hardy mic preamps onto the tape."

Ezratty was most excited about getting the call to work on last spring's Bob Dylan *Unplugged* program, an expanded version of which was also released as a CD in May. "It was one of those things where you never know how he's going to be," Ezratty says. "We've done Dylan a bunch of times, and he's incredibly unpredictable. It was a big question for everybody what it would be like because the rehearsals were extremely closed. I showed up to one, and it was awkward at best. We did rehearsals, and Dylan wasn't even singing, and it was one of those deals where everything sounded fine but we were wondering, 'Can we ask him to give us a level before the audience comes in?' And he ended up being quite accessible, actually. The legend precedes him, so you're probably more nervous than you should be. It ended up being a couple of performances where Dylan was way into it and he was smiling and having fun, singing great and playing his ass off on the guitar. He played these amazing leads that were incredibly soulful."

Ezratty says he used about 30 in-

puts for the acoustic band. Dylan's guitar was all DI, and his vocals were a Shure Beta 87. Drums were an AKG D-112 on the kick, a B&K 4011 and a Shure 57 on the snare, a 414 on the hi-hat, SM91s on the toms, B&Ks on the cymbals and a Shure VMP22 stereo microphone (suggested by Dylan's crew) above the drum set. The stand-up bass was DI, plus a KM84 wrapped in foam in the bridge of the instrument. Ezratty used two U87s on keyboardist Brendan O'Brien's Leslie cabinet.

"We did simultaneous 48-track and 24-track analog recording. The mic preamps went straight to each track of the 48, and then we did some combines of the inputs to get it down to 24 tracks, just in case when they got to the album they freaked out because it was recorded digitally. As it turned out, they mixed to digital. [Ed Cherney and Don Was mixed the album at Record Plant/Hollywood.]

"To have my name on a Bob Dylan record has got me thrilled like I haven't been thrilled in years," Ezratty says. "It's the first time in something like 12 years that I've called the record company to make sure my name was on the record."

### A GRUELING LIFE ON "THE ROAD"

For Kooster McAllister and his Record Plant Remote, fast turnarounds are literally a way of life, but even he has to admit that the work he did on the excellent syndicated series *The Road* (which was not, alas, picked up for another season by Tribune Broadcasting) was fairly grueling work. "We did 54 artists in a three-month period, so we were definitely hustling out there," he says. "Most of them were pretty major artists, too: James Taylor, Trisha Yearwood, Emmylou Harris, Vince Gill, Shawn Colvin, Marty Stuart, Mary Chapin Carpenter." The program took McAllister and the truck to big and small markets, mostly in the mid and deep South.

"We tried to do five or six artists per show, and a typical show was three days for us," McAllister explains. "The first day was an ESU [engineering setup]—power setup, hanging mics. The second day was band run-throughs. At that point, we get a basic soundcheck for each band. Each band would typically play about six songs. We'd set our levels, program them into the computer for the console and the Massenburg for fader positions. Then the third day would



be dress rehearsal, which would be filmed in the morning. They'd bring in a couple of hundred people and put them up front and then do all the close-up camera work. Then the evening would be the performance with a regular crowd. There would be 20 minutes maximum between each artist, and each artist was a completely different setup.

"They had rolling risers that the drum kits and keyboards were on. We had two separate monitor desks and two front-of-house positions so we could check one hand backstage while the other hand was onstage. It was pretty hard doing that while we were trying to record. But it worked out well.

"We did what everyone calls 'festival patching'; in other words, drums are always in drum holes, and if one person has a smaller drum kit than the other, then there are open holes left. But the kick is always the kick, the bass is always the bass, and Shure gave me an endorsement package of microphones, so all the drums always had the same types of mics—SM91 on the kick, SM98s on the toms, 57s on the snare; standard mics that I can deal with but also that a P.A. can deal with. We used 414s for overheads. All the vocal mics, all the guitar mics, everything stayed pretty similar. You could expect similar levels from guitar amp cabinets. [He used 57s on guitars.] Most of the vocals were Beta 87s, which I think is a great-sounding vocal mic.

"We recorded the show 32-track—24 tracks of Dolby SR and eight tracks of DA-88," McAllister says. "We always printed the audience mics on the DA-88 and any 'oh-by-the-ways'—if we had lots of keyboards or things like that. I always ran two DA-88s with the same program material in both so if there was a dropout, there would be a backup. It happened twice in the three-month period where there was a quick dropout. And I think it was the tape rather than the machines. After trying all the brands, I think the Maxell was the best."

Working in so many different environments provides its own challenges, McAllister says. "Some arenas allow you in [with the truck], others keep you outside and you have god-awful long cable runs. But being that the primary focus of these concerts was [The Road], things were really tailored to what was right for me, as opposed to a lot of shows where we

go in, we're doing a one-off for a radio broadcast, and they hand it to me and say, 'Okay, this is what you have to deal with.' I was allowed to control how things were going to come to me."

#### IT'S A VIDEO...AND AN ALBUM!

David Leonard, who has mixed Dwight Yoakam's last few albums and worked extensively with Yoakam's producer/guitarist Pete Anderson, acknowledges that the new CD, *Dwight Live*, "was an afterthought. It was originally just supposed to be a video. It was the last shows of the tour, and we brought in Le Mobile [to record it].

This was never intended to be an album. I'm very surprised that it is because it was only ever mixed to picture. I mixed it strictly on small speakers for video. It's definitely the case of where you have a shot of someone playing an instrument, you bring up that instrument. You mix to picture and you mix according to the cuts. It's a very different sort of thing when you're presenting the information for the ear that the eye is seeing. Normally, of course, you'd do it totally from the ear's standpoint only."

Actually, the disc sounds fine—a true representation of what a Yoakam show is like. It was recorded over

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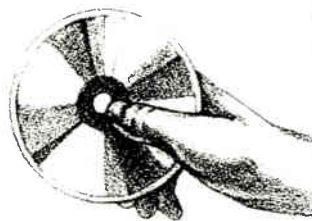
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two nights at San Francisco's 2,100-seat Warfield Theatre, but "we had a calamity the first night," Leonard says. "About the third song, we totally lost power, and then it came off and on for a bit. Apparently, the stage electricians had promised [Le Mobile] a full 100-amp service, but by the time they'd kicked up all the lights and the cameras and everything, it tripped. We lost at least half of the first night. We never got it to tape. So we were committed to using the second night, and fortunately that went smoothly."

Le Mobile is equipped with a Neve 8058 console with Flying Faders, Neve preamps, Studer A800 24-tracks, Dolby SR, and all the outboard equipment anyone would need. Leonard says, "The actual recording was pretty standard. We just took a split off of the stage and the P.A. miking. We changed the overheads and a few of the drum mic choices. Those mics included 414s for overheads, SM91 on the kick, SM57 and SM98 on the snare, 98s on the toms, SM81 on the cymbal; M88s on the Leslie, accordion, and Dwight's vocals; 57s on Anderson's guitar amps; and a 408 on Dwight's guitar. Piano, bass, acoustic guitar, mandolin and fiddle were all DI. Leonard says he used the audience miking scheme suggested by his assistants from Le Mobile, using six mics and a small Yamaha mixer.

The album has a very live and ambient feel, probably, Leonard suggests, "because it was mixed to video. There were a lot of shots of teenage girls in the audience, so the sound reflects that to a degree. But it's also a good-sounding room, and hopefully you can hear that on the record, too."

#### **THE FACTS ON SHADOWFAX**

For many years, fans of the popular world beat/new age instrumental group Shadowfax have been clamoring for a live album. Now, with the first release on their new label, Sonic Images, we have the dynamic *Shadowfax Live!*, featuring a cross-section of some of their best-known material, as well as a couple of new tunes.

Recording took place over three nights (six sets) at a Santa Cruz, Calif., club called Palookaville, with SF Bay Area-based engineer Phil Edwards handling the taping with his remote truck, which is equipped with a 48-input API console and both analog 2-inch with Dolby SR and 24 tracks of DA-88 digital. Edwards says

that Shadowfax-leader Chuck Greenberg was initially skeptical about using the DA-88s for this project, but he was won over by both the sound and the relative cost—Edwards estimates about \$1,200 was saved in tape costs alone.

Edwards says that the DA-88s have proven to be very reliable so far. "There are occasional dropouts, just like there are on any digital format, but no more so than you'd find on a 3348 or anything else. Like any MDM—or even a reel to reel—they have to be kept pristine. Tascam's literature says they shouldn't be cleaned more than every 50 hours, but I don't understand that. They have to be cleaned *all the time*. We throw in a cleaning cassette every day before we put up a date, and it runs flawlessly. The other thing is use premium tape—absolutely top-of-the-line tape. We haven't done a remote yet where we've had a dropout. I'm really happy with the system. I use it interchangeably with 2-inch now. And the beauty of this system is you can record for almost two hours straight, running either PAL tapes or the 3M AHD113s, which will record for an hour and 56 minutes. So you can do an entire set on one tape with no sweat."

Miking for the dates was very straightforward, Edwards says. He did do some premixing to get the drums down to four tracks and the guitar DI and miked amp down to a stereo pair, but the bass, keyboards and Greenberg's saxes and lyricon had dedicated inputs. Edwards also set up a left-center-right audience miking scheme (using U47 FETs, his only esoteric mic choice). The band's long-time engineer, Dann Michael Thompson, handled the mix and a few cosmetic touch-ups at Group IV Audio in Hollywood. By that time, Edwards was deep into other projects, like one of the 50 albums he recorded for the Concord Jazz label last year. "It's been completely nuts for a long time now," he says with a resigned chuckle. In the recording business, that's *good news*.

#### **MAKE WAY FOR SHORTY**

Ed Eastridge of Big Mo reports that business for his truck (equipped with Sony APR-24 recorders and a Sony 3036 console) has been good and that he's expanding his operation to include a second, smaller truck dubbed "Shorty" (as opposed to "Big Fella").



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The EQ in/out features an FET switch which is silent thereby virtually eliminating any possibility of DC clicks to the system and has a LED to notify you of the EQ status.

### Sweepable Lo-Cut Filter

Reduces low frequency noise such as pops, microphone handling, stage noise or transport rattle. The sweep control allows you to precisely set the filter roll-off frequency over a 400Hz roll-off over the full bandwidth of below 20Hz to 30kHz, 1dB.

### +48V Phantom Power

Individual on/off controls for DC to MIC/LINE inputs provide power to each channel. The +48V is available by internal jumper.

### MUTE

The mute switch toggles the channel or the input using a silent FET circuit and has a red LED to show the mute status. These buttons are programmable to any one of eight separately assignable MUTEs. **Check out the section "Programmable Mute Groups"**

### Pre Fade Listen

This switch automatically overrides the selected monitor source (on the applicable jack or the external monitor output) with the pre-fader channel signal to check signal quality and gain settings.

### Fader

100cm long throw smooth travel faders offers -10dB boost above the normal 0 operating point. A speed slide or stop below the faders is used to control the fade-in time.

### MIC/LINE

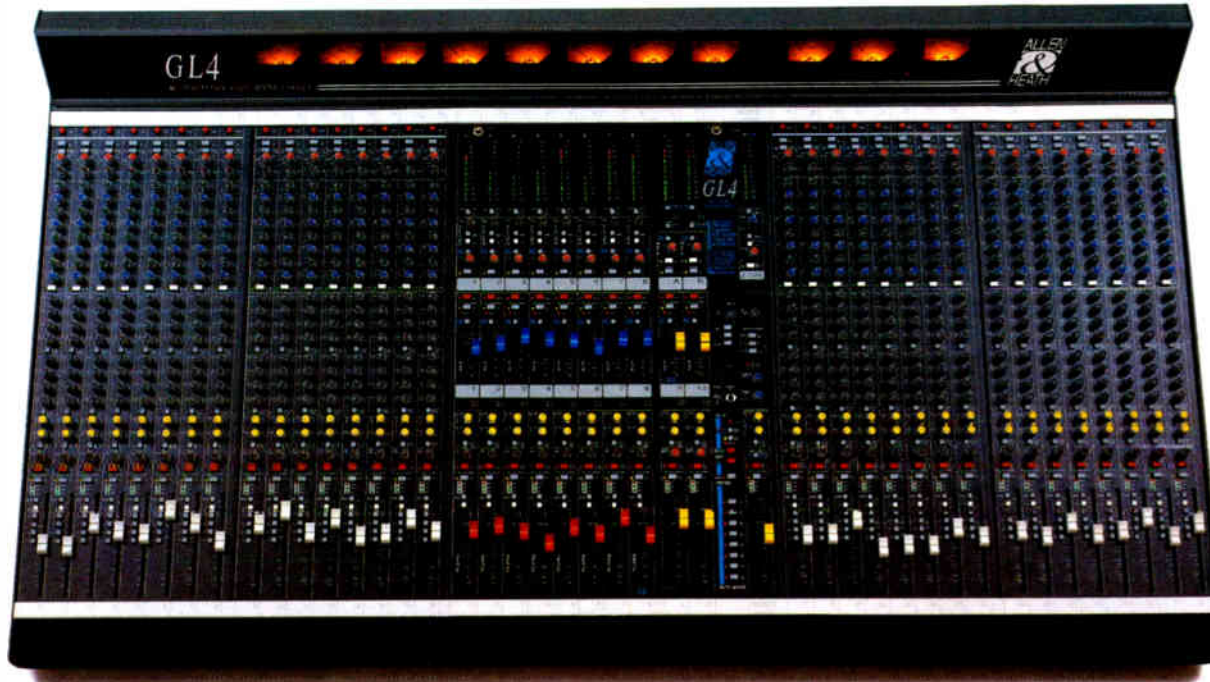
Select either the MIC or LINE input source. Our MIC/LINE switch works as a 20dB pad. Our MIC/LINE switch works as a 20dB pad on the XLR connector which allows you to plug line level inputs to the XLR connector. No more getting out adapters to get your XLR line level sources into the console.

### Input Meter

FET input control of the channel gain level on stage LED meter shows pre-fader signal presence. The meter indicates fading for 20dB+ Ods (normal) and 30dB+ Ods (15dB boost) clipping.

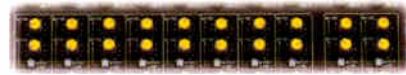
### Group Module

This is the all-in-one. The Allen & Heath 44 designed 11 channel 11-buss will provide a complete front application for any size studio. Thus the console gets better the longer the group is built. Non-FOH Monitor Playback Multi-Track application. The console is ideal for any application. The topology that allows for the flexibility of being used before or after the console.



### AUX Reverse Section

This is where the whole Front of House/Monitor Console switching thing takes place. When these switches are depressed, it routes what is the auxiliary Master level to the corresponding group or Left/Right fader below. You do use all the channel axes in the Post-fader Post-eq position. Remember they're mixes now! In order to get the wedge mix the source select switch for the mono master fader is what you need. This button switches the source for the mono fader from the mono bus to the AFLUPFL circuit. You'll notice that each of what USED TO BE the aux master sends has an AFL switch on them. Now those buttons turn the mases on and off in your wedge mix. Cool huh?



### Matrix

Of course no sound reinforcement console worth its salt is complete without a matrix section. The Allen & Heath GL4 has an 11x2 matrix that has the unique ability to be into corresponding auxiliary sends. The really cool thing about the fly-rules mixes and mix minus stuff.

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### GAIN

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### Phase Reverse

Reverses the phase of the input source to correct the phase differences often encountered in microphone placement, cables wired in reverse and reverse-wired microphones. Reversing the phase of a signal can also be used to minimize acoustic feedback microphones in live sound mixing.

### AUX Sends

10 aux sends with individual level controls and pre-post fader switching allow uncompromised routing to combinations of external effects devices, cue systems, stage monitors and the like. They're arranged in two groups of four and one group of two for logical grouping of effects and monitor sends. A color-coded system allows permanent contribution for pre or post fader, above the cut level or equal. Further options include pre or post mute (pre-EQ, post-mute stand-off), adding to stage monitors, 10 aux sends become the 10 mases pre-input, all post-fader and LED to allow total functionality in a dedicated stage monitor mixer.

### Routing

This bank of switches routes the post-fader signal to the L/R and Groups (or pairs) and the pre-fader signal to the MONO mix. In STAGE MONITOR applications the MONO bus is used for AFL monitoring; the stage engineer's wedge speaker.

### Programmable Mute Groups

This system is a total no-brainer to operate. Hit the Meta Group Master button and the mutes come on. With their corresponding LED's Hit Mute Preview, select another master and the green LED's tell you which mute is going to come on when you go to that group. Hit the Group Edit button, mute master button and change the status of each mute (green LED's tell you whether they're assigned to that group) hit group edit again and Viola! those changes are stored. Heck, if you really want to get fancy, check out the MIDI capabilities we've got up our sleeve.

### PAN

The new pan circuit gives even power separation on all buses. The pan control positions the signal between L (odd) and R (even). The routed output at Allen & Heath use a differentiated, constant power pair for multi-application environments. This introduces a 2.5dB dip in the center position. This has no effect on the individual separation mono buss.

### MIDI Capabilities

MIDI in/out and through allow you to run the programmable multi-system on any MIDI external unit. It also allows the user to change the send program change to external devices so that if you change from scene to scene or effect to any other device, it will go simultaneously through and more, more implementation schemes are available on the GL4.



"The new truck is going to have ADATs and DA-88s in it to give us more flexibility and to let us work with more kinds of clients," Eastridge says. "It's a small box, only 16 feet with a four-foot attic on a GM 3500 HD chassis, which is real nice to drive compared to the big truck. This is more like driving a car. John Storyk designed it, and it's going to be really nice. We'll have four DA-88s and four ADATs, and we're starting with two Mackie 24x8s, because I already have those, but as soon as it starts making money I'm going to upgrade, probably to an Amek Big. It's going to have a couple of dbx 900 racks, a couple of channels of nice API EQs and mic pre's for stereo stuff and two PCM-70s, a couple of SPX-1000s, Genelec 1030 monitors. The whole idea is that it's small, easy to drive, and it won't be real expensive.

"We've been doing carry-in gigs with [MDMs] for about a year-and-a-half now," Eastridge continues. "We have racks that have the DA-88s, and our tech has built a bunch of modular wiring harnesses so you can just hook it together real quick to the stage splitter. The main drawback to

that is that unless you get real far from the stage, it's really hard to monitor, so you're usually listening to headphones real loud, and the two-mix is usually pretty dismal."

The MDM truck should solve that monitoring problem, and it will save thousands of dollars in tape costs, too. Eastridge says he'll undoubtedly use Shorty for projects recorded for Big Mo's in-house record label. "We like blues a lot, and there are still some authentic blues honky-tonk guys down in Mississippi that we could afford to follow around for a whole week with the little truck. With the big truck, it would be too much of a hassle and too much money. I think Shorty will be a good vehicle for just gathering stuff."

#### LIVE FROM MOUNTAIN STAGE

For the past ten years, one of the best live music shows on radio has been NPR's *Mountain Stage*, which is broadcast from a 500-seat auditorium in Charleston, W. Va. With four or five acts per two-hour program, literally hundreds of performers have played on the show. Additionally, since 1991, Blue Plate Records has put out eight

phenomenally eclectic compilations of *The Best of Mountain Stage*, featuring performances by such roots, rock and folk greats as R.E.M., Dr. John, Daniel Lanois, Richard Thompson, Indigo Girls, Steve Forbert, Bruce Hornsby, Los Lobos, Counting Crows, Cowboy Junkies, Morphine, Crash Test Dummies, Warren Zevon and many, many more. (The discs may not be in your local record store. Call [800] 521-2112 for info.)

For the entire ten years the show has been on the air, Francis Fisher, a veteran engineer with an extensive New York broadcasting background before he moved back home to West Virginia, has manned the small control room beneath the auditorium's stage. "I'm a broadcast engineer, not a recording engineer," he is quick to point out. "I mix live-to-air, and I don't like spending my time in a recording studio, mainly because I don't think performers are as disciplined in the studio. Performers seem a little more serious when there's an audience, and there's no possibility for a take two. That's the way I like to work."

Fisher has 48 channels in his

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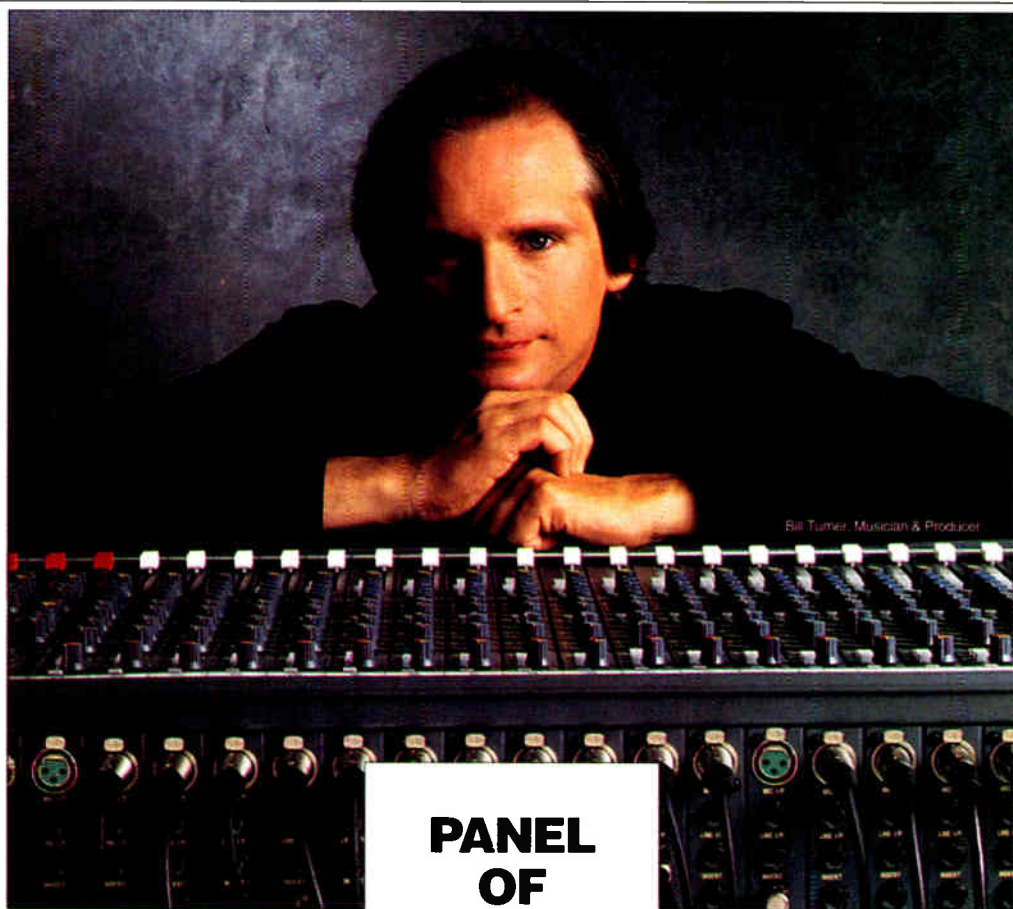
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Bill Turner, Musician & Producer

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Bill Turner is an expert on professional sound studios as well as being a renowned session musician\*. Bill is equally talented as a producer in his Brooklyn, New York, studio, Bill Turner Productions (BTP).

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*\*Among his noteworthy accomplishments, Bill Turner played lead guitar with Bill Haley, and toured Europe with a revival of the original 1954 Comets band. He performs and records with his own band, Blue Smoke.*

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Yamaha PM3000 (he's thinking of moving up to a PM3500; the 4000 is too big for his space), and with up to five acts every show, usually including three full bands, "we always have to share some channels and some equipment," he says. "Some groups double up and share drum kits and bass rigs where possible. Where it's not possible, that's okay; we deal with that."

"Even after ten years, we do a lot of things almost spontaneously," Fisher adds. "We change the miking around, try new things week to week. So it's hard to generalize and tell you what we do because it might be completely different the next week. But the most interesting thing I've been experimenting with is this older Fostex stereo microphone [for the audience tracks]. What I'm finding is I have less interference from the P.A. cabinets, and it leaves more applause sound, and the spread on the sound is much wider because it's stereo." Fisher says he uses mainly Shure mics, "and, of course, we've used 414s and various others."

The show is recorded to a pair of DATs, but Fisher is decidedly unenthusiastic about that medium, noting that numerous dropouts have occurred in show dubs. Analog backups are always made of the program back at the studio. "To be honest, I'm not thinking about how it's going onto tape," Fisher says. "You have to view me as just another radio listener who happens to have a set of controls." He mixes on the fly, trying to make the music as "natural-sounding as possible." He does admit to boosting the high end because "it's chopped off and limited out before it's broadcast, so I do that to compensate."

#### SWEET HOME CHICAGO

Tim Powell's Chicago-based Metro Mobile truck—with its Neotek Elite console, JH-24 analog and DA-88 digital recorders—does work all over the Midwest on projects large and small: a gospel gig here, an extended stint on an album (like the one they made in a tobacco barn in Kentucky with Eleventh Dream Day) there. But Powell says one of his favorite ongoing gigs is doing the annual broadcast on National Public Radio of the giant free blues festival each June in Chicago's Grant Park bandshell. It's not, strictly speaking, a recording gig, though of course the 2-track mix that Powell sends back to the local NPR affiliate

for satellite uplink is archived on DAT. Still, Powell says, "I always set it up like its a multitrack recording, even though it's not. I submix things the way I would to a multitrack, even if we're not multitracking, just because it's easier that way."

The Grant Park bandshell has a very sophisticated sound system for a civic facility, and the city even has a good collection of sturdy mics, including Shure 57s and SM81s. "I'll bring out my own 414s for piano or Beyer ribbon mics for horns or other mics I like, too," Powell says. "But the key has to be reliability: I'll make a small concession on the sound for something that's going to perform well under different conditions."

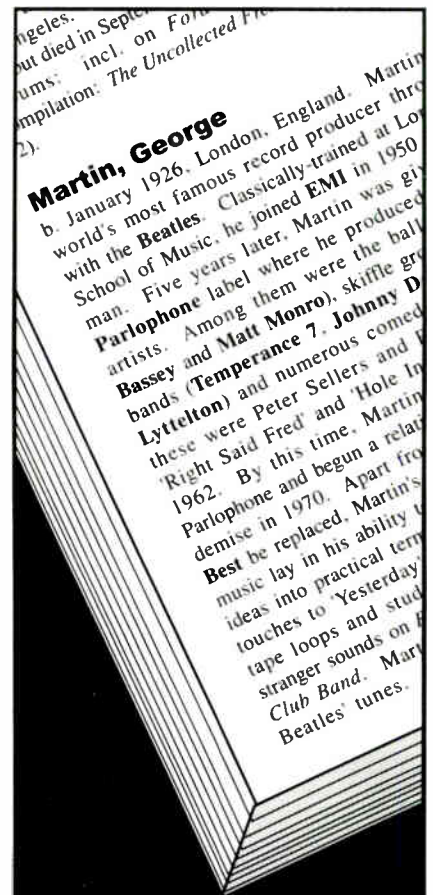
Powell spends a great deal of time preparing his input map for his console, since the concert always features many different groups and singers in varying configurations. He keeps it straight by making sure the input assignments remain the same from act to act: "I'll say, okay, these 12 channels are always going to be drums. Some acts might use them all, some not. These two channels are always for bass, these six are for guitar, these for piano, and so on." Powell says he usually uses 37 inputs for the stage.

Up to 100,000 people have turned up for the festival some years, and the weather can be fickle, so Powell comes prepared, with specially designed umbrella stands for his six audience mics (Beyer and AKG shotguns, Shure SM81s) in case it rains, and Rycote shotgun windcreens: "This is the Windy City, after all," he notes.

"One of the other problems of recording down there is its very close to all the major television transmitters in Chicago, so it's a very, very RF-rich environment. One of the things we found that works best is using Canare Starquad mic cable, which, instead of having two conductors and a shield, has four conductors and a shield. It really helps reduce RF and hum."

The festival isn't one of Metro Mobile's big-money gigs, but the blues is such an integral part of the Chicago music scene, it's almost an honor to be part of that music's biggest day each year. "It's always special," Powell says. "People have a real good time there, and so do I." ■

*Blair Jackson is executive editor of Mix.*



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by James D'Angelo

# HARD DRIVES

## DRIVING THEM HARD

I

f you haven't been in the market for a hard drive recently, you may be in for a surprise. For most readers, this is an article that just a couple years ago would have been absurd. Who needs a new hard drive? The studio computer was meant for some simple spread sheets and basic word processing. Now, the 200MB or less hard drive on the still-new computer is maxed out with multimedia video and sound files, and you're looking for more digital real estate. In the new era of computing, high-quality sounds and images are being loaded onto your computer and chewing up a seemingly infinite expanse of digital storage. In fact, everything is getting digitized. The studio logo, the telephone answering machine, the video game down the hall, the 24-track, etc. Pretty soon, someone's going to figure out how to digitize the engineer and the band, and we'll all be able to go home.

But until that day comes, your studio is still doing business and you're going to need a big, responsive hard

drive. Fortunately, selecting a drive these days is not difficult. Most of the manufacturers build reasonably similar drives for reasonably similar prices. But before you can decide what drive is right for your needs, terms such as write caches, AV drives, spindle speed, access time, throughput and ZIP are going to have to start making sense. Also, you're going to have to live with the fact that, no matter which drive you purchase today, it's going to be sitting in the bargain basement tomorrow. But who has clients that are going to wait with you for a sale? The time to buy is now.

If you're looking for strictly backup options, the possibilities are endless. There's removable cartridges, DATs, ZIP drives (a new low-cost removable drive from Iomega), optical, floptical and regular hard drives. But when it comes to recording audio and video there is only one choice—the fastest and largest high-speed AV drive you can find.

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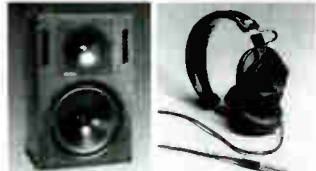
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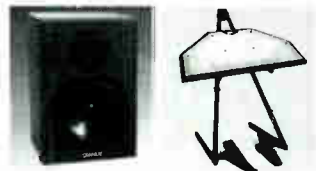
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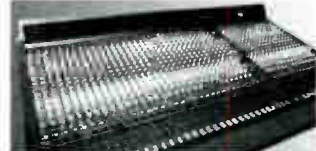
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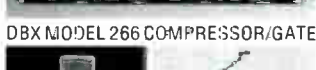
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about access time and spindle speed. Access time is the amount of time it takes for the drive to put data on the bus after the computer has requested it. The current crop of drives is pushing the envelope at around 7 milliseconds response time. Just like clocking Jesse Owens in the hundred, the shorter the time, the better. On the other hand, spindle speed is a measure of the actual disk platter revolution. Numbers less than 7,200 revolutions per minute are not fast enough to provide high-quality video and multitrack audio. Obviously, the faster the drive spins, the quicker it can reach data and the more data it can churn out. Therefore, the higher the spindle speed, the higher the data throughput. Fortunately, access time and spindle speeds are related, but some manufacturers may not be able to pair up the same specs as others. Be sure to check them both.

Another big issue is whether the drive is considered an AV drive or not. Even though there is some false advertising going on, the term AV is becoming more and more standardized. AV drives are a relatively modern concept, and they are designed for situations where the drive itself must be accessing or writing data continuously for a number of minutes (even a couple of hours).

Typically, all hard drives generate heat and cool down as they operate. As this occurs, the drive's platters and read-write heads expand and shrink at different rates, causing alignment and read-write problems. The old-fashioned way of dealing with this is proving to be hazardous for sustained throughput applications. Older drives shut down data transfer every two to ten minutes, for as long as half a second, to thermally recalibrate the drive. In multimedia situations, this thermal recalibration could result in an audio dropout or up to 15 lost video frames—fifteen frames that are guaranteed to contain irreplaceable action. Clearly, this is not good.

The solution to this problem is the AV drive. Manufacturers have designed special, more expensive mechanisms that use some of the drives platter as a dedicated servo controller. Intermeshed with the data is servo control data that allows the drive to *check* its location continuously without shutting down data transfer. These

new drives are designated as AV drives, and if multimedia is your course, you should insist on this feature and be prepared to pay an extra \$100 or so per gigabyte.

A commonly talked-about feature on drives these days is write caches. This is a block of RAM, usually around a megabyte, that provides a buffer for transferred data. For multimedia applications, a write cache can come in handy, but it will typically be used only as a patch for a drive lacking some of the above features. It needn't be considered at all if access time, spindle speed and thermo recalibration specifications are all up to par. Still, for small files a good-sized write cache can make a drive seem like a speed demon.

Now that you're about to purchase some slick new hard drive, you need to make sure that your computer or digital audio workstation is up to snuff. There can be a situation where your drive is faster than your comput-

er, in which case you're not getting the most out of your drive. Modern computers are using newer high-speed versions of IDE and SCSI, which are, fortunately, much faster than most drives on the markets. But this needs to be checked with your dealer or manual. Some of the newer drive standards are working on 16-bit transfers (dubbed Wide) as opposed to the aging 8 bits. And as multimedia steps into the forefront, hard drive interfaces are slugging it out for predominance. Look to see interface names like Firewire, Ultra-SCSI, SSA and Fibre Channel coming soon to a computer near you. Unfortunately, it is impossible to predict future standards.

Another thing to consider is whether the drive should be internal or external. Except for the price advantage—about 100 dollars—and the space advantage, there is little reason to have an internal drive. They don't work better because of being located inside the machine and, in some instances, can even burden the computer's power supply. The advantage of an external drive is portability. There's nothing like tucking a four-pound drive under your arm and traveling off to the next work site with your entire system and file setup. It's also great for sending data back and fourth. I have Fed-Ex'd a 2GB drive with a 50-minute video clip on it to L.A., and my editor was able to edit the project and send it back without ever needing to send tape or an EDL. Neat.

You may have heard all this talk about the Internet and the I-way for sending data around. But for transporting data on the order of gigabytes the only inexpensive method that works is the "sneaker net"—physically unplugging the hard drive and running it over to your buddy with another computer. For greater distances, Fed-Exing hard drives may be in your future. If transporting of data is something that you need to do on a more frequent basis, high-capacity data can be transferred using ISDN (see *Mix*, April 1995).

Fortunately, in the present day, the manufacturers are producing a solid crop of high-speed AV drives at an ever-decreasing price. Warranties on the products are standard at five years, and for anything over a gigabyte, nothing less should be considered. ■

*James D'Angelo is Mix's technical editor.*

## Some Terms to Know

**SPINDLE SPEED:** The speed at which the disks revolve (typically between 3,600 and 7,200 rpm).

**ACCESS TIME:** The rate at which data is found on the disk (typically between 8 and 15 ms).

**WRITE CACHES:** Small amounts of RAM that act as a buffer for data transfer. This is a useful feature for situations where small amounts of data are being saved.

**THROUGHPUT:** The ability of the drive to coordinate read and writes with its data caches for the highest sustained data-transfer rate.

**AV DRIVES:** Drives designed to bypass the typical thermo recalibration of standard drives. This allows for an uninterrupted data stream and higher sustained throughput.

**RAID:** Redundant Array of Independent Disks. A system where more than one drive stores identical information, to avoid data loss.





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by Philip De Lancie

# MUSICNET

## MUSIC RETAIL COMES TO CD-ROM

**G**iven the strong sales of multimedia-equipped computers last year, doubts about consumer interest in interactive entertainment have largely been laid to rest, and questions about music industry involvement have shifted from "if" to "when." Most of the music business focus is currently on so-called interactive music, a still-evolving term that, used broadly, encompasses anything from the multimedia liner notes of "CD-Plus" to the kind of participatory music-making championed by Todd Rundgren. Multimedia, however, promises to change not only *what* music consumers buy, but *how* they buy it. Music-oriented home pages, for instance, both independent (see "Audio on the Internet," January 1995) and label-sponsored,

seem to have burst out all over the World Wide Web this spring, and several CD-ROM magazines with a musical orientation, such as *Substance* and *Blender*, offer labels new opportunities to promote their artists. Perhaps the purest example, though, of multimedia's potential for reaching beyond the traditional retail music-selling environment is the new *MusicNet CD-ROM* from MNI Interactive of San Francisco.

The core idea of MusicNet is to facilitate the purchase of music by allowing consumers to preview before they buy. The company's president, John Atcheson, a former musician and songwriter who later worked for Apple, MacroMind (now Macromedia) and Digidesign, reportedly got

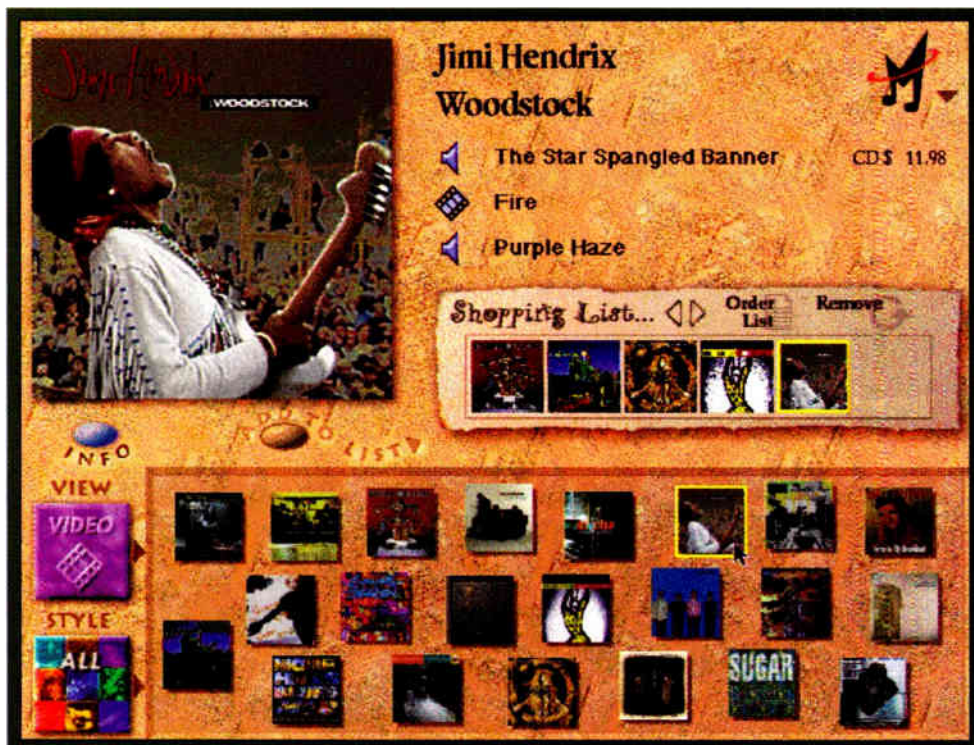


Figure 1: The Browse mode from MusicNet's CD-ROM allows the user to hear audio excerpts and see video clips from hundreds of current albums, as well as add those albums to a "shopping list."



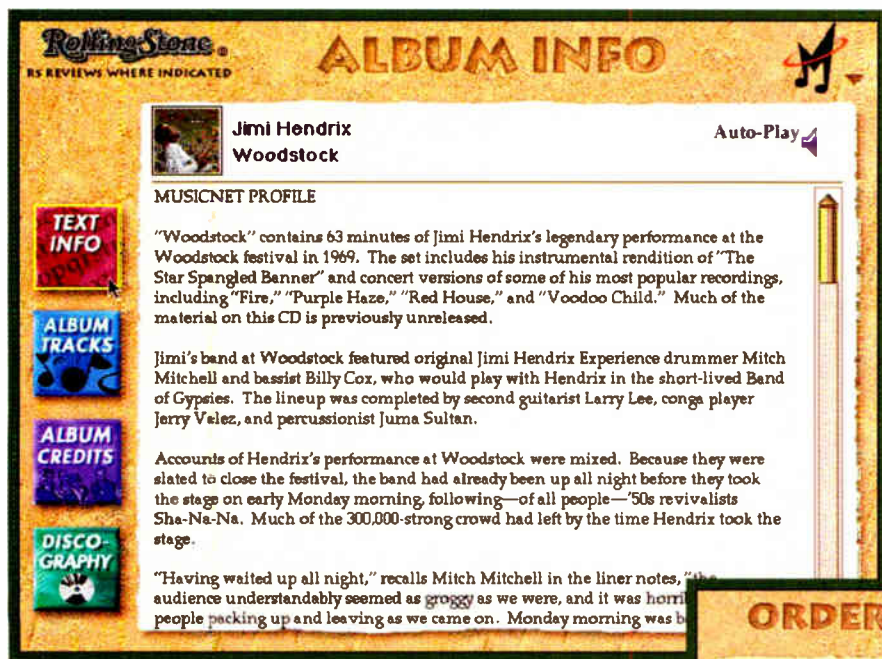


Figure 2: Info mode offers a text description of the selected album, as well as a track listing, album credits and the artist's discography.

the idea after realizing how hard it was to keep up with new music once he had left the music business. Atcheson and his partners are now offering music preview/order services via both telephone and CD-ROM.

"The goal of the company," says Mary Freeborn Standley, MNI's director of marketing communications, "is to make MusicNet available to people in any way that it is convenient for them to receive it. We have gone to market with a CD-ROM version and are in test-market with a phone version in Seattle and Denver with our co-marketing partner, *Rolling Stone*. And we will be announcing an on-line presence within the first half of this year."

The MusicNet telephone-based service offers 30-second previews of three selections from 3,000 or more albums, both major label and independent. Music is offered in a wide range of styles, and the company claims to update selections daily. By dialing MusicNet on a touch-tone phone, members can access the previews either by entering the name of an artist or by entering a five-digit code for an album. The codes are found in a quarterly Preview guide, which resembles a slightly oversized CD booklet. Although MNI seems anxious to avoid being associated with traditional record clubs, and there are no minimum orders or purchase obligations, members may

have to pay as-yet-unspecified fees. The timing for general availability of the service has not been finalized.

Like the phone service, the CD-ROM, which MNI plans to issue quarterly, is designed around the principle that previews whet the appetite for purchases. The premiere disc features some 750 excerpts—audio-only or music-video—from over 250 current releases. Song lists and credits are included for each album, as are artist discographies and album profiles prepared by MNI's in-house editorial staff. MNI editors also pick which albums from the thousands submitted make it onto the CD (the company has no affiliation with any label and, Standley maintains, there is no label influence over the album selection process). An introductory annual subscription costs \$29.95 (including membership access to the phone service); individual issues will sell for \$8.99 each. MNI charges \$11.98 to \$14.98 per album for most releases (plus shipping) and offers a 30-day money-back guarantee on all purchases.

While the CD-ROM obviously can-

not be updated as quickly as the phone service and offers fewer previews, it makes up for these limitations by providing an attractive and media-rich shopping environment. "We've managed to pack over six hours of audio on the disc," says Standley, "but it also has the enhancement of visuals. You get album cover art and some music videos. You really get the 'view' part of the word 'preview,' because you are seeing everything, which helps to replicate what you see in a record store."

"We are, in essence, an electronic record store," Standley continues. "One of our basic tenets behind the



Figure 3: The Order List allows the Shopping List to be reviewed and revised. When the user quits the CD-ROM, the list is stored as a text file, which can be faxed or e-mailed to MNI, or simply phoned in.

design was, "Can you get to the music quickly and easily?" And that is something that the labels have been very responsive to and, accordingly, very happy to send along their music to us. We have developed good relationships with the labels over the last three years or so—all six of the major distribution companies, as well as the enormous number of independents out there. We do not charge them to come onto our products, and they don't charge us for the material we use, because they view this, rightly, as a promotional vehicle for them."

#### INTERFACE DESIGN

"I would argue that the MusicNet CD-ROM goes beyond what you can do in a record store," says MNI's director of engineering, Michael Mills. "You can preview lots more stuff per unit of time than you could in a real record

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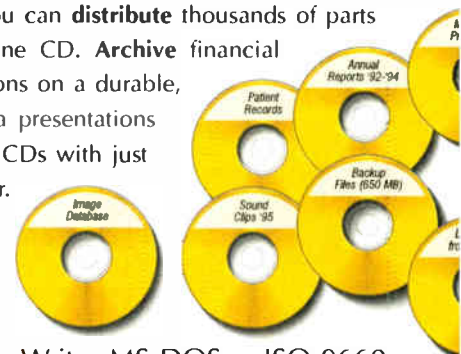
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store." Mills led the team that created the CD's straightforward interface. The opening menu shows video excerpts from the latest releases by the issue's featured artists, which you can click on to go directly to those albums. You can also go directly to the built-in order list (Fig. 3), though when you first open the program, your list will be empty. Most users will probably choose the Browse button to begin the process of previewing.

In Browse mode (Fig. 1), you pick the category of albums to preview by using a combination of the View and Style buttons. View allows you to choose from either a text list (index) of all albums (sortable either by album title or artist name), or graphical displays of album covers in the following categories: those with video and audio excerpts, those with audio excerpts only, and those that can only be previewed through the phone service. The Style button categorizes by musical genres, either Rock, Urban, Country, Jazz, Blues, World, Other or All. Once you've selected your categories, you simply click on any displayed cover to go directly to the screen for that album, where you can listen to and/or watch three previews, read the album info and commentary (by clicking the Info button, see Fig. 2) or add the album to your order list.

Boiling all the options down to a clean, manageable interface turned out to be anything but a simple task for Mills and his team. "I thought it was going to be a piece of cake to design this one," Mills says. "It turned out we went through no less than 30 or 40 different incarnations, prototyped at different levels of detail.

"The first goal was that people should find it very usable and not be frustrated in finding a specific thing they were looking for, and that they should also find it useful to be in a serendipitous explore mode," he adds. "For example, the little miniatures are to entice you to explore just by dragging the mouse over them and seeing what comes up. If you are really looking for something specific, go into the Index view, and there you get the scrolling list with type in it, so you should be able to quickly find whether any particular artist is in the database. The second goal is that it should be fun and playful without getting in your way. And it should also be aesthetically pleasing."

Though the basic layout of the interface has been set, and the product is designed to allow future issues to be created by plugging new content into the existing shell, further enhancements are planned. "Right now," says Mills, "the user needs to be in control, doing something, going through the list to make it work. We'd like to also develop a hands-off mode, sort of an auto-play feature. Also, we'd like to get much further into understanding who our users are and suggesting things that they might like."

Additional "enhancements" planned for future issues of the CD-ROM include a section displaying featured

albums from record labels (paid advertising), an editorial feature each issue, and "one-button" ordering via modem or fax from within the MusicNet order screen (rather than the current system of an external text file that the user sends after quitting the main program).

Regarding the possibility of further integrating the CD-ROM and phone versions of MusicNet—using a modem to dial in and transmit the codes for selections, which the user then previews by picking up the phone—Standley says only that the possibility is "something we are looking into." Similarly, MNI's Internet presence is

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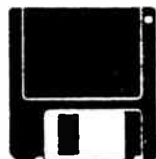
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AUDIO & MULTIMEDIA

envisioned as a complementary but separate service, neither accessed through the CD-ROM interface nor allowing the playback of downloaded files from within it.

**AUDIO PRODUCTION**

Because the MusicNet CD-ROM was conceived from the outset as an ongoing publication rather than a one-shot, particular emphasis was placed on creating an efficient production process. "The way we approached doing the disc is that most of the time and energy on an ongoing basis would be in creating the data," says former VP of engineering John Worthington, who has since left MNI to form his own company. "So we came up with our own tools to make it easy to create the data and to allow us to share it."

Sharing the data across platforms is crucial to the disc's design, because it is a hybrid disc for both the Mac OS and Windows platforms, and there is no room for redundant data. Only the "runtime player" is different for each platform, though Worthington estimates that about 70% of the code in each player is common to both, with the rest platform-specific. The initial interface prototypes were mostly created in Macromedia Director, but the players for the actual release were programmed in C++.

Video files for the disc are delivered in Apple's QuickTime format. "We were originally going to use QuickTime for the audio, too," Worthington says. "But you don't want to use individual files for all the pieces of audio, because you have hundreds of items in your directory, and the directory access on the disc starts slowing down. So we came up with the idea of using one big file, and we had huge problems in the lag time it took QuickTime to seek in a big file. We would say 'go to 3 hours, 21 minutes in the movie,' which is where a particular audio sample would start, and there would be a huge lag before the audio would play.

"What we found," he continues, "is that the best performance came from using a single AIFF file. All the audio on the CD is concatenated into one big file, and we store in and out points." The AIFF file is able to play under Windows, he explains, because "with an 8-bit, 22.05kHz AIFF file, the raw data is the same (as Win-

dow's .WAV format). Under Windows, we just pick out the piece of data we want and use the .WAV calls.

"There is a problem on the Mac, however, which is that if you give 22.05 sound to the Sound Manager, it is going to try to sample-rate-convert it to 22.254. It turns out that if you just say in the AIFF header that the data is 22.254, the Sound Manager won't sample-rate-convert it, and the actual pitch change from playing it at the wrong sample rate is less than a cent." For the sound on the videos, the problem is reversed: QuickTime on the Mac stores the audio at 22.254. "I believe," Worthington says, "that QuickTime for Windows does the opposite hack of what we did. It just plays it back at 22.05."

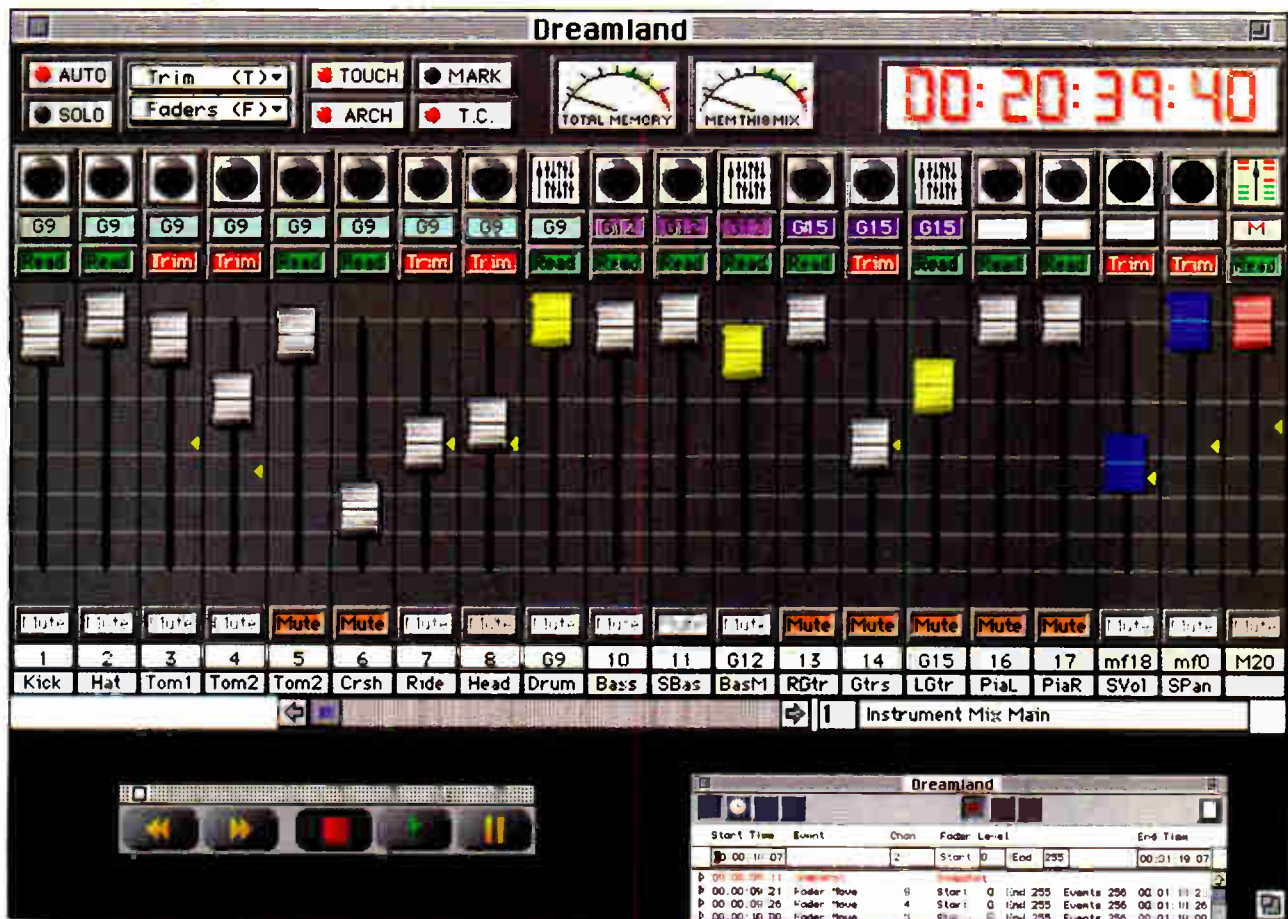
Another consideration for the videos is choosing the best audio source. "We capture the audio for the video clips at the same time as the video," Worthington says. "If you take the rock videos, you could actually get better quality by grabbing the same cut off the CD and resynching it, because that's all they do when they make the video. But when you hit things like Rap, they do alternative takes for the video, and you are just stuck. Also, the audio quality of the videos we get really varies. We have found that some of the 1/2-inch tapes we get are actually better than some of the 3/4-inch U-matics because they are first- or second-generation, while some of the 3/4-inch are dubs coming off of some tape they have done hundreds of other dubs from."

The preparation of the audio for conversion to the final delivery files begins, Worthington says, with "capturing everything at 16-bit, 44.1kHz stereo using a Digidesign Audiome-dia II card. We sample-rate-convert all the sound to 8-bit, 22.05 kHz with our own sample-rate converter that we wrote, which also goes through and does dynamic compression. You just point it at a whole folder full of AIFF files, and it does everything. It also does the conversion for the MusicNet phone service, which uses 8-bit µlaw audio at 8 kHz. So after the audio people have the exact edits they want, they just push the button and it spits CD-ROM files out one end and files for the phone service out the other." ■

*Philip De Lancie is a mastering engineer at Fantasy Studios in Berkeley, Calif.*



# Imagine This On Your Console

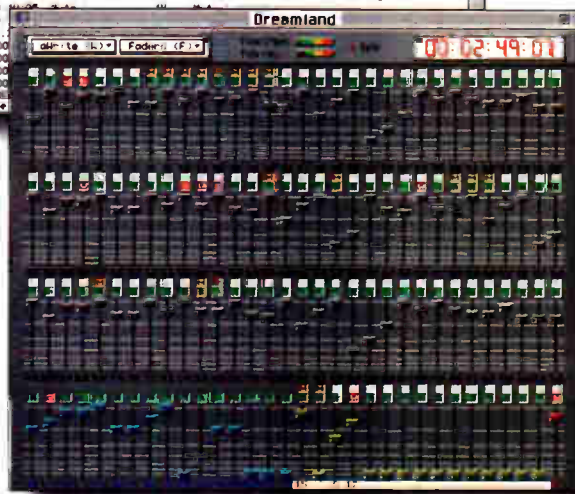
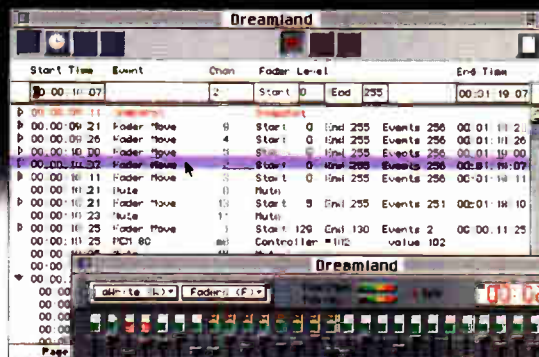


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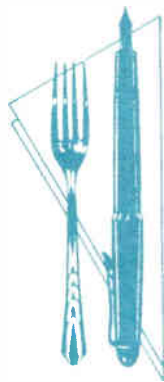
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World Radio History

by Mr. Bonzai

# ALBHY GALUTEN

## REINVENTING RECORDS



Today, Albhy Galuten is concentrating on developing the CD of the future, the big whopper disk with all the audio, plus text, graphics, photos and video. Twenty years ago, he was a producer racking up hits with the Bee Gees, Andy Gibb, Samantha Sang, Barbra Streisand, Kenny Rogers, Diana Ross and Dionne Warwick. With 11 consecutive Number One records to his credit, he was a linchpin in the phenomenal Miami hit-making machine.

A guitarist, keyboardist, synth explorer, string arranger and songwriter as well as gifted producer, Galuten's studio experience began at Ardent Studios in Memphis. Next came a stint as assistant to Tom Dowd at Criteria

in Miami, learning his craft on records such as the Allman Brothers' *Eat A Peach* and Eric Clapton's *Layla* (on which he also played). He contributed keyboards to the work of Rod Stewart and The Eagles before putting on the producer's cap for some of the biggest sellers in history, including *Saturday Night Fever*. In recent years, he has worked with Wet Wet Wet and produced some exceptional music with San Francisco's Jellyfish.

After a veggie burger and fries at a local Santa Monica coffeeshop, we adjourned to his home studio, where we were flanked by robust IBM and Macintosh powerstations.

**Bonzai:** When did you first pick up a musical instrument?

**Galuten:** I played violin in the first grade, but it was just too painful—a violin is hard to listen to even if you're a mediocre musician, and it was just torture for me. I took up piano in the third grade.

**Bonzai:** Did you immediately have a sense that you were destined for musical greatness?

**Galuten:** No, but I had an older brother and a sense that it would be hard to succeed in chess or basketball. Music was something I could do myself, work on alone and move ahead. In the first year with piano, what drives you is that you can reproduce this melody twice in a row and have the teacher say it's okay. Once you get past that, you have a place where you can go by yourself, a creative process, which is rewarding whether other people like you or not.

**Bonzai:** In your formative years, what was your biggest influence?

**Galuten:** Records and radio—blues records in the early '60s, then rock 'n' roll. I used to stay up all night listening to jazz on WTFM and WBAI in New York, in awe of greats like Oscar Peterson, Bill Evans, Art Blakey.

PHOTO: MR. BONZAI



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**Bonzai:** Formal musical training?  
**Galuten:** Piano lessons through high school, a couple of years at Berklee in Boston, playing in a lot of bands. There are two levels of learning: theory, notes, understanding what's going on, the technique. But there is also the development of the ears. I discovered that in the studio with Tommy Dowd and Jerry Wexler. When I was in high school, I was dating Billy Vera's sister. Steve Rowell, my writing partner, and I wanted to play real soul music. We were tired of that New York fake soul music. Billy had the phone number of a guitar player in Memphis, and we called him and asked, "If we come down to Memphis, would you listen to us play?" He said sure, and we went down and hung out.

After a couple of weeks, we went into the studio and cut some demos. His name was Charlie Freeman, a member of the original Marquees. He had a friend named Jim Dickin-son, who has produced everything from Alex Chilton to The Replacements, and played piano on the Stones' "Wild Horses." He was a producer at Ardent, in the 4-track days. It's funny, but at the time, 4-track meant four speakers. With mono, there had been one speaker, stereo had two, 3-track had three, and when they went 4-track, they just figured they had to have four speakers. When they got to 8-track, they gave it up.

We cut our first demos in Memphis, and I kept going back and forth, cutting more demos. After I left Berklee, Charlie and Jim and a few others had gone to Miami to work for Atlantic Records as the staff rhythm section. I went down, hung out, kept my mouth shut and my ears open. Eventually, I was hired by Atlantic as Tommy Dowd's assistant, and then as a staff producer.

In terms of my early education at home, I guess my parents didn't know how often you were supposed to tune a piano. In the studio, while tracking, we tune the piano every day, but in suburban middle America, you maybe tuned the piano every couple of years. I didn't really know what "in tune" was, and here I was in the studio.

never having played guitar, and just took tuning for granted. Jerry Wexler was saying something to Aretha during the session for "Spanish Harlem" about her pitch being a little flat, and I was thinking, "I didn't even hear it!"

Today's technology has made it a lot easier to hear, so contemporary records are much more in tune and much more in time. The pitch microscope was not so finely tuned back then, and we've learned over the years to look carefully at pitch,

**F**or me, the big successes were experiencing moments of great performance. Very few people are blessed with the chance to really touch greatness.

make adjustments with harmonizers, look at the meter, use razor blades and delay lines. But at the time, around 1970, it was a new world to me—suddenly hearing careful tuning. If you listen to records from that

well-tuned.

I was Tommy Dowd's assistant for about a year, and he gave me a lot of freedom. He'd have me fly to New York or Memphis to record vocals or horns. Tommy knew I had never written a string chart, but he said, "You can do it. Go ahead." I'd listen to some records, read a few books, figure it out and stand in front of the orchestra. Arif would let me do string charts on his sessions, and bless him for being helpful and patient.

**Bonzai:** What's the most important thing you learned from Tom Dowd?

**Galuten:** I don't want to sound condescending to artists—I live for artists, and that is what my life is about. But in my tactless way during the first years, I would say things like, "Well, that second verse is no good. Could you do it more like the first verse?" Then I got a little wiser and realized there is no need to piss anybody off. "Boy, the first verse is great. Can you do the second verse a little more like that?"

Tommy had a knack of not talking about the music at all. Instead, he would tell a story that would create a state of mind. It might only be a 30-second anecdote, but the singer would go back and be more comfortable, more connected, more in touch with the event. He was very impressive in his ability to understand the emotions of the artist, such as John Coltrane.

I also believe he is the first person credited with splicing tape. He was on a Mitch Miller date, and they had the early version of a breakdown where everyone would stop and clap their hands. There was one clap with a really bad flam, and they planned to do it again. During the break, Tom started thinking about it. If he held a pair of scissors with his wrist cocked back all the way, it would always be at the same angle. He realized he could cut out that bad hand clap and splice it together. The group came back, listened, and nobody

noticed. As far as I know, that was the birth of creative editing.

**Bonzai:** How do we jump ahead to your big successes?

**Galuten:** For me, the big successes were experiencing moments of great performance. Very few people are blessed with the chance to really



(L to R) Jason, Alby and Noah Galuten

era, many of them are way out of tune. That opening chord comes in, they're singing, the choir comes in and hits that chord, and you go, "Ow!" But back then, it sounded normal. To be in this environment with Jerry Wexler, Arif Mardin—their ears were fabulous, well-educated and





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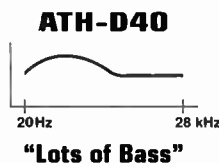
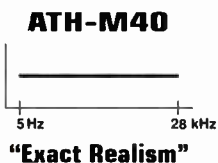
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## TANNAY System 6 NFM II

A 6.5 inch Dual Concentric with Tulp HF wave guide forms the heart of the System 6 NFM II providing a reference single point source monitor in a more compact enclosure than ever before. Every aspect of design fully complements the drive unit's capability. The rigid cabinet with carefully contoured baffles and trim minimizes diffraction and the high quality minimalist DMT crossover and gold-plated Bi-Wire terminal panel optimize the signal path. Pin-point stereo accuracy with wide frequency response, good power handling and sensitivity make this an ideal nearfield monitor.



## PBM Series II Reference Monitors

The PBM II Series is the industry standard for reference monitors. They feature advanced technologies such as variable thickness injection molded cones with nitrile rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected inductors. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability and most important, real world accuracy.

### PBM 5 II

- Custom 5" injection-molded bass driver with a nitrile rubber surround for extended linearity and ultimate low frequency reproduction. They are better damped for reduced distortion and exhibit more natural open and detailed midrange.
- Woofer blends seamlessly with the 1/2" polyimide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring.
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density mdf for minimal resonance, and features an anti-diffraction radus from baffle design.

### PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" low-frequency driver and 3/4" tweeter are led by a completely redesigned handwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully ruggedized and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

### PBM 8 II

- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors and components available.
- Full cross-braced matrix mdf structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities.

## Stewart PA1000/1400/1800 Power Amplifiers

- High frequency switch mode power supply fully charges 120,000 times per second (1000 times faster than conventional power supplies) requiring far less capacitance for filtering and storage.
- High speed recharging also reduces power supply "sagging" that affects other designs.
- Incredibly efficient, 5 PA-1000 or PA-1400's (4 PA-1800's) can be run on one standard 20 amp circuit. There is no need for staggered turn-on configurations or other preventive measures when using multiple amp set-ups, as current drawn during turn-on is only 6 amps per unit.
- They produce smooth and uncolored sound, while offering very full detailed low end response and tons of horsepower. They each carry a 3 year warranty on parts and labor.



PA-1000 weighs 9 lbs., is 15" deep and occupies one standard rack space. Delivers 1000 watts into 4Ω when bridged to mono.  
 PA-1400 weighs 16 lbs., is 15" deep and takes 2 standard rack spaces. Delivers 1400 watts into 4Ω when bridged to mono.  
 PA-1800 weighs 17 lbs., is 17" deep and takes two rack spaces. Delivers 1800 watts into 4Ω when bridged to mono.

## TASCAM M-2600 Series 16/24/32 Channel Eight Channel Mixers

**LOW NOISE CIRCUITRY**  
 • Combining completely redesigned low noise circuitry with Absolute Sound Transparency™ the M-2600 delivers high-quality extremely clean sound. No matter how many times your signal goes through the M-2600, it won't be colored or altered. The signal remains as close to the original as possible. The only coloring you hear is what you add with creative EQ and your onboard signal processing gear.

• Double reinforced grounding system eliminates any hum. World-class power supply provides higher voltage output for better headroom and higher S/N ratio.

**PREMIUM QUALITY MIC PRE-AMPS**  
 • The M-2600's mic pre-amps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. This lowers distortion and widens dynamic range. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel.  
 • The M-2600 accepts balanced or unbalanced 1/4" inputs and low-impedance XLR jacks. Better still, the TRIM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the -20dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug anything in it - keyboards, guitars, basses, active or passive microphones, samplers and more. No matter what you put into it, you can be confident that signal can be placed at optimum levels without a lot of fuss.

**THE BEST AUX SECTION IN THE BUSINESS**  
 The most versatile AUX section in its class, rivaling expensive high-end consoles. 8 sends total. 2 in stereo. Send signal in stereo or mono, pre- or post-fader. Available all at once. Return signal through any of 6 stereo paths.



**FLEXIBLE EQ SECTION**  
 You'll find both the veg and split-EQ sections on some mid-level consoles. But that's where the similarities with the M-2600 end. The M-2600's bi-directional split EQ means you can use either or both EQ sections in the Monitor or Channel path - or defeat the effect altogether with one bypass button. Most other comparably-priced mixers will lock the shelving mix into the Monitor path only, limiting your EQ application.

**ADVANCED SIGNAL ROUTING OPTIONS**  
 Direct channel input switching. Assign to one of eight busses, or direct to tape or disk - or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching. You won't find this kind of speed or flexibility in a one-size-fits-all board.

**ERGONOMIC DESIGN**  
 The M-2600 has a big studio feel. All buttons are tightly sprung loaded, lock into place with confidence and are large enough to accommodate even the biggest fingers. The faders and knobs have a light, smooth "expensive" feel and are easy to see, easy to reach and a pleasure to manipulate. Center detents assure zero positions for EQ and PAN knobs. Smooth long throw 100mm faders glide nicely yet still confidently allow you to position them securely without fear of accidentally slipping to another position.

## MACKIE MICRO SERIES 1202 12-Channel Ultra-Compact Mic/Line Mixer

Usually the performance and durability of smaller mixers drops in direct proportion to their price. Fortunately, Mackie's fanatical approach to pro sound engineering has resulted in the Micro Series 1202, an affordable small mixer with studio specifications and rugged construction. The 1202 is a no-compromise, professional quality ultra-compact mixer designed for professional duty in broadcast studios, permanent PA applications and editing suites where nothing must ever go wrong.

**BIG CONSOLE FEATURES**  
 • Working S/N ratio of 90dB, distortion below 0.25% across the entire audio spectrum. Switchable +48 volt phantom power and -28 dB balanced line drivers.  
 • Real switchable phantom-powered mic inputs with discrete balanced mic preamps as good as those found in big consoles.  
 • Has 4 mono channels, each with discrete front end mic pre-amp line input and four stereo channels, each with separate left and right line inputs.  
 • Every input channel has a gain control with unity at the center detent for easy setup. Also a pan pot, low frequency EQ at 80Hz high frequency EQ at 12.5 KHz, and two aux sends with up to 20dB available gain.  
 • Main outputs operate either balanced/unbalanced, as required.  
 • Switchable three-way 12-LED peak meter displays.

• Master sect on includes two stereo aux returns, a separate headphone level control, metering and two stereo aux returns.  
 • Line inputs and outputs are designed to work with any line level, from instrument level to +10dB pro -10dB to professional +48dB.  
**HEAVY DUTY CONSTRUCTION**  
 • Designed for non-stop 24-hour-a-day professional duty in permanent PA applications, TV and radio station, etc.  
 • Sealed rotary controls instead of open frame phenolic potentiometers that suffer from dust and contamination.  
 • Has steel chassis, rugged fiberglass circuit boards and a built-in power supply. Also has exceptional RF protection.  
**MULTIPLE APPLICATIONS**  
 • Ideal "entry level" mixer for those just starting a MIDI suite.  
 • Ideal as headphone or cue mixer, level matching pro audio "tool kit" drum or effects sends submixer, 8-track monitor mixer.

## CR-1604 16-Channel Mic-Line Mixer

The hands-down choice for major touring groups and studio session players, as well as for broadcast, sound contracting and recording studio users, the Mackie CR-1604 is the industry standard for compact 16-channel mixers. The CR-1604 offers features, specs, and day-in-day-out reliability that rival far larger boards. It features 24 usable line inputs with separate headroom/ultra-low noise Unityplus 10-segment AUX sends, 3-band equalization, constant power pan controls, 10-segment LED output metering, discrete front end phantom-powered mic inputs and much more.

**LOWEST NOISE, HIGHEST HEADROOM**  
 • With the CR-1604 having the lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range) at the same time are not mutually exclusive. It is free of commonly encountered headroom restrictions, and is able to handle the occasional pegged input with ease. In fact, many producers consider it the only mixer capable of handling the attack and transients of acoustic and electronic drums.  
**CONSTANT POWER PAN POT'S**  
 • Only with constant power pan pots will a source varied hard left or hard right have the same loudness as when it is sitting dead center. While most small mixers pass simple balance controls for pan pots, the CR-1604's carefully optimized constant power pan circuitry make it a professional tool with the kind of performance necessary for CD mastering, video posting and other critical audio production.  
**IN-PLACE STEREO SOLO**  
 • Stereo "in place" solo allows not only the monitoring of level and EQ, but also stereo perspective. Usually found in very expensive mixers, stereo solo allows you to critically scrutinize and carefully build a mix using all the channels with their respective sends and AUX returns.  
**UNITYPLUS GAIN STRUCTURE**  
 • Proper gain settings are facilitated by proper gain labeling, along with center-click detents on the faders, clearly understandable input trim controls and output meters that read channel levels in solo mode. With properly set levels you achieve very high headroom and low noise at the same time.

**EFFECTS SEND WITH GAIN**  
 • Unusual circuit design that provides two different "zones" that reflect real world use: send from each channel can vary in level from off to unity gain, which is the normal range of effects sends from other mixers. Since you also get another whole zone from the center detent to +15 dB of gain, the channel fader can be pulled down and the effects send can be boosted above unity when more effect is needed.

**INTELLIGENT EQ POINTS**  
 • Low frequency EQ is at 80 Hz where it has more depth and less hollow midbass "bunk". Midrange is centered at 2.5 KHz, providing for more control of vocal and instrumental harmonics. A specially-shaped HF curve that shelves at 12 KHz creates more size and less aural fatigue.  
**REAL MIC PREAMPS**  
 • The CR-1604 has genuine studio-grade phantom powered balanced input mic preamps on channels 1 through 6. All CR-1604 (and XLR10) discrete input mic preamp stages incorporate four conjugate-pair, large-emitter geometry transistors just like the big mixers use. So, when recording nature sound effects to heavy metal or mixing flutes or kick drums, you get the quietest, cleanest results possible.  
**BUILT TO LAST**  
 • The CR-1604 is designed for non-stop, 24-hours-a-day professional duty - even for tours that log 100,000 miles in three months. It has sealed rotary potentiometers that are resistant to airborne contamination like dust, smoke, liquids, and even the oxidizing effects of air itself.

**Optional Accessories**  
 OTTO-1604  
 Add sophisticated computer controlled automation to your CR-1604. When connected to the MIDI port of your computer (PC, Mac, Amiga or Atari), each one of the 16 input channels can be programmed to change gain or to mute, just as you would program a sequencer. Master levels can be programmed as well, along with all buss channels.  
 XLR10  
 While the standard CR-1604 comes with 6 high performance mic inputs, there are times when you need more. Enter the XLR10. This simple-to-install accessory adds 10 more (for a total of 16) mic inputs with the same quality performance and features as those in the CR-1604.

## DEMETER INNOVATIVE AUDIO SYSTEMS

### VTMP-2b Tube Microphone Pre-Amp

The VTMP-2b Tube Microphone Pre-Amp makes any ordinary microphone sound like a rare vintage tube mic. A two-channel unit, the VTMP-2b is completely tube-based for a distinctively warm but clean and quiet sound. It is designed to provide the recording studio the unsurpassed sound of tube amplification in a package that is easy to operate and interfaces with modern consoles and tape recorders. The VTMP-2b is typically used to bypass the mixer's console pre-amps to provide the shortest possible signal path from mic to tape. This delivers a tremendous increase in fidelity in applications ranging from digital multi-track to professional and home recording studios.

**Features:**  
 • Each independent channel has a variable gain switch (40 to 60dB), phase switch, low cut switch, 20dB microphone pad, rotary faders for level matching and LED peak indicators.  
 • Each channel also has switchable 48v phantom powering, eliminating power supplies for condenser microphones.  
 • Equipped with 1/4" phone plug inputs and front panel switches so that it can be used as a DI box with electric or acoustic line level instruments as well.  
 • Uses classic tube design supported by the finest in modern components such as Jensen J13K1 vacuum transformers, polypropylene capacitors and 15kV metal resistors.  
 • The power supply features full regulation of the B+ voltage (250v) and the filament voltage (12.6v) for low noise and quick response.



With today's audio systems stretching the limits of program dynamics it's become critical for engineers to obtain maximum loudness with the minimum of distortion components. To fully utilize the dynamic range available, it is of equal importance that they have a method of monitoring and establishing the maximum safe level at which a system can operate. That's why every Dorough Audio Level Meter simultaneously shows three dimensions of program material content: Peak, Average Power and Compression are displayed on a color-coded 40-segment LED scale. The meters are easily viewed while providing high precision indications of program energy content.

**Loudness Meter Model 40-A**  
 The model 40-A has a scale allowing 14dB of headroom in 1dB steps. A stand-alone unit it measures 8" x 2 1/2" x 6" and has an internal power supply. Model 40-AP has a peak-hold option as well.

**Loudness Meter Model 40-B**  
 The Model 40-B provides metering of relative loudness to peak modulation. The 40-B is a scale differentiation of the 40-A and is calibrated in percent (%) modulation, with the lower scale in dB from +3 dB to -3 dB. Model 40-BP has a peak-hold option as well.

## BEHRINGER

### COMPRESSORS MDX2000 Composer Interactive Dynamics Processor

- Powerful and versatile signal processing tool provides 4 most commonly dynamic control sections: fully automatic compressor, manually controlled compressor, expander and peak limiter.
- Innovative IKA (Interactive Knee Adaptation) circuit combines the "musicality" of the "soft knee" function with the precision of the "hard knee" characteristics. Provides subtle and "inaudible" compression of the sound allows creative dynamics processing.
- Auto processor provides fully automatic control of attack and release times. There is also manual control.
- Interactive Ratio Control (IRC) expander eliminates "chatter" on or around the threshold point.
- Interactive Gain Control (IGC) Peak Limiter combines a clipper and program limiter. This allows for zero attack, distortion-free limitation of signal peaks.
- IGC is invaluable in live applications. Servocontrolled inputs and outputs. Operating level switchable from -10dB to +4dB.

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 • Manually adjustable attack and release times. • Program dependent attack/release times

### EQUALIZERS STUDIO PARAMETRIC - PEQ305 The Musical Equalizer

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- Stereo variable filter. • No interaction between the parameters.
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Unlike traditional condenser mics, the capacitive transducer in Sennheiser condenser mics is part of a tuned RF-circulator circuit. Its output is a relatively low impedance audio signal which allows further processing by conventional bipolar low noise solid state circuits. They achieve a balanced floating output without need for audio transformers, and ensure a fast, distortion-free response to audio transients over an extended frequency range.

**MKH 20 P48U3 Omnidirectional**  
Low distortion push-pull element transformerless RF condenser, flat frequency response, diffuse/ear-field response switch (6 dB boost at 10 kHz), switchable 10 dB pad to prevent overmodulation. Handles 142 dB SPL. High output level. Ideal for concert, Mid-Side (M-S), acoustic strings, brass and wind instrument recording.

**MKH 40 P48U3 Cardioid**  
Highly versatile, low distortion push-pull element transformerless RF condenser, high output level, transformerless, switchable proximity equalization (-4 dB at 50 Hz) and pre-attenuation of 10 dB to prevent overmodulation. In vocal applications excellent results have been achieved with the use of a pop screen. Recommended for most situations, including digital recording, overdubbing vocals, percussive sound acoustic guitars, piano, brass and string instruments. Mid-Side (M-S) stereo, and conventional X-Y stereo.

**MKH 60 P48U3 Short Shotgun**  
Short interference tube RF condenser, lightweight metal alloy, transformerless, low noise, symmetrical capsule design, smooth off-axis frequency response, switchable low cut filter (-5 dB at 100 Hz), high frequency boost (+5 dB at 10 kHz) and 10 dB attenuation. Handles extremely high SPL (135 dB) ideal for broadcasting film video sports recording, interviewing in crowded or noisy environments. Excellent for studio voiceovers.

**MKH 70 P48U3 Shotgun**  
Extremely lightweight RF condenser, rugged, long shotgun, low distortion push-pull element, transformerless, low noise, smooth off-axis frequency response, switchable low cut filter (-5 dB at 50 Hz) and 10 dB preattenuation. Handles 133 dB SPL with excellent sensitivity and high output level. Ideal for video/film studios, theater, sporting events, and nature recordings.

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## Symetrix

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- Combination of 128 factory presets and 128 non-volatile user programs guarantee predictable and repeatable effects from session to session, performance to performance.
- Has XLR-balanced (analog) monoaural mic and line inputs and XLR-balanced stereo output. XLR-balanced and S/PDIF (RCA) inputs and outputs. MIDI input/output supports connection to virtually any type of MIDI control device for programming or controlling the 601 in real time.
- Ideal for a variety of recording, broadcast, live sound, and post production applications.

### 488 Dyna-Squeeze 8-Channel Compressor/Interface

- Can easily increase average recording levels on your digital or analog tape recorder by 10dB with no side effects.
- Tracks processed by Dyna-Squeeze have presence and increased articulation. Subtle sounds become more up front.
- Many professional mixing consoles have output levels that are much hotter than digital recorder inputs. The 488 matches any console to most any digital recorder.

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## TASCAM DA-88 Digital Multi-Track Recorder

The first thing you notice about the eight channel DA-88 is the size of the cassette - it's a small Hi-8mm video cassette. You'll also notice the recording time - up to 120 minutes. These are just two of the advantages of the DA-88's innovative use of 8mm technology.

- The ATF system ensures that there will be no tracking errors or loss of synchronization. The DA-88 doesn't even have (or need) a tracking adjustment. All eight tracks of audio are perfectly synchronized. What's more, this system guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks - whether you have one deck or sixteen (up to 128 tracks).
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48kHz (user selectable). The frequency response is flat from 20Hz to 20kHz while the dynamic range exceeds 92dB. As you would expect from a CD-quality recorder, the wow and flutter is unmeasurable.



- One of the best features of the DA-88's is the ability to execute seamless Punch-ins and Punch-outs. This feature, offers programmatic digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks, whether you want to generate special effects or compensate for poor timing. All of this can be performed easily on a deck that is simple and intuitive to use.

## Fostex RD-8 Multi-Track Recorder

Fostex has long been a leader in synchronization, and the RD-8 redefines that commitment. With its built-in SMPTE EBU reader generator, the RD-8 can strip, read and jam sync time code - even convert to MIDI time data. In a sync environment the RD-8 can be either Master or Slave. In a MIDI environment it will integrate seamlessly into the most complex project studio, allowing you complete transport control from within your MMC (Master Machine Control) compatible sequencer.

- Full transport control is available via the unit's industry-standard RS-422 port, providing full control right from your video bay. The RD-8 records at either 44.1 or 48kHz and will perform Pull-Up and Pull-Down functions for film/video transfers. The Track Slip feature helps maintain perfect sound-to-picture sync and the 8-Channel Optical Digital Interface keeps you in the digital domain.
- All of this contributes to the superb sound quality of the RD-8. The audio itself is processed by 16-bit digital-to-analog (D/A) converters at either 44.1 or 48kHz (user selectable) sampling rates, with 64X oversampling. Playback is a completed with 16-bit analog-to-digital (A/D) and 64X oversampling, thus delivering CD-quality audio.

- The S-VHS transport in the RD-8 was selected because of its proven reliability, rugged construction and superb tape handling capabilities. Eight tracks on S-VHS tape allow much wider track widths than is possible on other digital tape recording formats.
- With its LCD and 10-digit display panel, the RD-8 is remarkably easy to control. You can readily access: 100 locate points, and cross-tape time is fully controllable in machine to machine editing. Table of Contents data can be recorded on tape. When the next session begins, whether on your RD-8 or another, you just load the set up information from your tapes and begin working. Since the RD-8 is fully ADAT compliant, your machine can play tapes made on other compatible machines, and can be controlled by other manufacturers ADAT controllers. Your tapes will also be playable on any other ADAT deck.



## Panasonic

### SV-3700/SV-4100 Professional DAT Player/Recorders

Panasonic's SV-3700 and SV-4100 are designed for professional applications. They have highly accurate and reliable transport systems with search speeds up to 400 times normal play speed. They also feature advanced, high-quality analog-to-digital (A/D) and digital-to-analog (D/A) converters and input/output circuitry designed to interface with the widest variety of devices.

#### SV-3700 Features:

- When recording via the analog inputs, a front panel switch permits selection of the sampling rate (44.1kHz or 48kHz). This avoids the need for a conversion of the sampling frequency in CD mastering applications. When recording through the digital inputs, it automatically clocks to incoming frequencies of 32kHz, 44.1kHz or 48kHz.
- Ramped record mode and unmutate with three seconds fade-in and five seconds fade-out provides automatic level changes at the start and end of a recording.
- High speed transport enables searching up to 250x normal speed. High-speed search up to 400x normal speed is possible once the tape has been scanned in Play/Fast-Forward or Reverse mode. This ensures access to any point on a two-hour DAT in approximately 27 seconds.

- Built-in shuttle wheel has two variable speed ranges, 3 to 15x normal speed in Play mode and 1.2 to 3x normal speed in Pause mode - an ideal way to find tape locations.
- Comprehensive display includes program numbers, absolute time, program time, remaining time and Table of Contents, which displays total recorded time and total PWD count for commercial prerecorded DAT tapes.
- Has XLR-balanced and unbalanced (phono) digital inputs and outputs. They provide direct interfacing with compact disc player, digital audio workstations and other components in a recording studio or production facility. As the XLR-balanced analog stereo inputs and outputs. Output level is selectable between +4dB and -10dB. The input level is +4dB.



#### SV-4100 Has All the Features of the SV-3700 PLUS:

Offers enhanced performance required for professional production, broadcast and live-sound systems. Features such as instant start, external sync capability, enhanced system diagnostics, additional digital interfaces and exceptional 20-bit audio make the SV-4100 the DAT quality standard.

#### QUICK START WITH TRIM AND REHEARSAL

- With 8MB of memory holding five seconds of audio data, the Quick Start function provides sound almost instantly after a play command is executed. Other DAT recorders lag about 7 seconds, making them unsuitable for professional applications.
- Easily adjust the Quick Start position and specify it by A-Time, Start ID or PWD. Recording via Quick Start is also possible allowing two SV-4100s to be used for frame-accurate punch-in/punch-out and assemble editing.
- You can adjust the Quick Start position with 1-frame resolution over a range of +50 frames. Using the shuttle dial and Skip key for adjustment. Frame number is preceded by + or - sign. A-Time, subcodes and peak level are displayed to provide a general guide to positioning.
- Without playing the tape, you can monitor the level of stored data to check your Quick Start position. This preview capability is handy before actual editing or on-air play. Repeated play is also possible, using about 15 seconds of the data to create a kind of sampler effect.

#### FRAME ACCURATE INDEXING AND EDITING

- Using the trim and rehearsal functions, you can accurately determine points to write start and skip IDs. These IDs can be written, rewritten or erased at any point in the recording and automatically renumbered.
- With two SV-4100s connected via the 8-pin parallel remote terminal, synchronized frame-accurate editing can be performed. Continuity of edit points can be checked by rehearsal playback. By entering and editing end position in one of the Locate buttons, you can determine a punch-out point as well.

#### FLEXIBLE SEARCH

- Easily and accurately access your A-Time. You can specify hour, minute, second and frame.
- In most modes, the currently displayed A-Time can be assigned to one of the Locate buttons. Then from Stop, Pause or Play you can rapidly cue to any of these four addresses by pressing its Locate key. In addition, Locate Last takes you to the most recent Quick Start A-Time position.
- Search is also possible by Start ID or program number.

#### 5-MODE EXTERNAL SYNC

Has 5 external sync modes. External sync is essential for applications such as video postproduction and stereo submix recording. It assures uniformity of timing between different equipment so the audio data consistently matches up with the target media.

- Select from 3 video external sync modes (25, 29.97 and 30 frames per second) or use the word sync (Digital Data modes (which lock to the input sampling frequency).

#### ENHANCED SOUND

The SV-4100 satisfies the highest professional expectations both in terms of sound and functionality. It features: new 20-bit equivalent resolution digital-to-analog converters.

#### MULTIPLE DIGITAL INTERFACES

- Has XLR-balanced digital input and output plus unbalanced digital coaxial and optical inputs and outputs. Analog inputs/outputs are XLR-balanced and output level is switchable between +4dB and -10dB, providing compatibility with other equipment.

#### 3-WAY REMOTE CONTROL

- GPI input allows simple triggering of Quick-Start Play. 8-pin parallel remote terminal connects to another DAT deck, computer or wired remote. Includes wireless remote control.

## TASCAM DA-P1

### Portable DAT Recorder

- With rotary two head design and two direct drive motors the DA-P1 offers one of the best transports in its class.
- XLR-balanced mic/line inputs (with phantom power) accept a broad range of signal levels from -60dB to +4dB.
- Analog line inputs and outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enables direct digital transfers.
- Uses next generation A/D and D/A converters to deliver amazing sound quality.
- Supports multiple sample rates (48, 44.1 and 32 kHz) and SCMS-free recording.
- Included in its design is a MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- To monitor your sound there is a TRS jack and level control for use with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. The DA-P1 includes a shoulder belt, AC adapter and one battery.



## SONY TCD-D7

### DAT Walkman Player/Recorder

- High-quality Standard Play (SP) mode provides up to two hours recording of 16-bit digital audio on a DT-120 DAT cassette. The SP mode is ideal for studio recording.
- Long Play (LP) mode allows up to 4 hours of recording/playback of 12-bit audio on a single DAT cassette. The LP mode is ideal for meetings, conferences or other voice recording.
- Equipped with digital coaxial and optical input connector. Maintains the highest signal purity for recording and playback of digital data sources with all information retained in the digital domain.
- Also has analog Mic and Line inputs for recording from analog sources without external adapters.
- High-speed Automatic Music Sensor (AMS) search function finds and plays tracks, skips forward or back up to 99 tracks, all at 100x normal speed.
- Has a Digital Volume Limiter System (DVLS) that increases listening comfort and sound quality by automatically adjusting for sudden level changes of the recording. It also helps prevent sound leaks through headphones.
- Two-speed cue-review lets you hear sound while player is in fast-wind modes - up to 3x or 25x normal speed.
- Compact and portable, it has an anti-shock mechanism that permits accurate recording and playback even while in motion.
- LCD display with backlit window clearly shows recording level, track number, operating status and 4-segment battery indicator, even in low ambient light conditions.
- Optional RM-D3K System Adapter Kit for complete digital interface. The kit is equipped with the input/output connectors for both the optical cable and the coaxial cable. Therefore you can use it as a relay between the TCD-D7 and other digital equipment. Also includes a wireless remote control.



## We Also Stock Fostex, HHB and Sony Professional Portable DAT Recorders

## DTC-A7

### Economical Studio DAT Recorder

The DTC-A7 is a high-quality two-channel DAT recorder that provides professional features at an affordable price. It incorporates advanced analog-to-digital and digital-to-analog converters for minimal sound distortion, a reliable transport system and a rich variety of subcode information. It also supports all major sampling frequencies, records Absolute Time Code and has coaxial as well as optical digital inputs and outputs. With its competitive pricing and advanced sound technology, the DTC-A7 is particularly well-suited for the home studio.

#### Features:

- Recording and playback can be done with three sampling frequencies (48kHz, 44.1kHz and 32kHz). For analog and digital input signals, a standard mode (48kHz) for compact disc and pre-recorded DAT tape (44.1kHz), for analog and digital input signals in long-play mode (32kHz).
- Coaxial (IEC-958 Type II) and optical (EIAJ) digital inputs and outputs. Also, unbalanced (RCA) analog inputs and outputs.
- Records A-Time (Absolute Time) Code. With A-Time Code you can check elapsed time from the beginning of the tape. Tape recorded with A-Time can also be used for editing on Sony's 7000 series DAT recorders, since they translate A-Time to SMPTE/EBU time code.
- Date function automatically records the year, month, day, day of the week, hour, minute and second in the subcode area. During playback you can display date to check when the tape was recorded. Especially useful when recording live performances.
- The DTC-A7 can operate in long-play mode. Analog input signals can be recorded or played back for up to four consecutive hours with a single DT-120 tape.
- Three motor transport system provides stable and precise transport. Also significantly reduces cassette loading time.
- Includes a wireless remote control and necessary hardware for mounting in a standard 19" rack.

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—Danny Elfman, Motion Picture and Television Score Composer



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touch greatness. Witnessing Aretha Franklin sing "Spanish Harlem" is one of those great moments. Being with Eric Clapton and Duane Allman working on *Layla* was incomparable. I played on some of those dates, and working on great records is a success in itself.

During the height of the Bee Gees period, Barry Gibb was incredibly talented, unbelievably on-the-money. He had amazing pitch, meter and a true sense of what was touching people at the time. There were also incredible technological breakthroughs going on at that time. I believe "Stay-in' Alive" was the first pop single that used a drum loop. It took ten years for drum loops to become a common element.

**Bonzai:** You were the producer on the Bee Gee records?

**Galuten:** Technically, it was produced by Karl Richardson, me and the Bee Gees. The three people who were in the control room all the time were Karl, Barry and myself. Karl was primarily the engineer, making sure that everything was going well. Barry was the visionary, and I suppose I was the translator. I had an intuitive sense of what Barry was going for. He'd play me a song and I would hire musicians, work out parts, come up with some ideas, work on the arrangements. For many of those records there really was a hand working together. It was certainly a collaborative effort with many talented people, but clearly it was the three of us in the studio, all day, every day.

**Bonzai:** With such phenomenal success, isn't it strange that the Bee Gees seem to get such a bum rap today?

**Galuten:** There is a distinction between writing as a craft and writing as an expression of your inner self. When you put your own soul into the work, as a Bruce Springsteen or a John Mellencamp, it's different from the craft of the great pop songwriters. The great writers of the '50s, like Leiber and Stoller, weren't writing about their lives. They were writing songs, and Barry was one of those. Certainly they were great songs that touched people. But a line like "I thought you came forever, but you came to break my heart" is not necessarily about his experience, his day-to-day life. If you don't bare your soul in public, you tend to get

a bum rap because it's not as real or touching in the sense of a personal reflection.

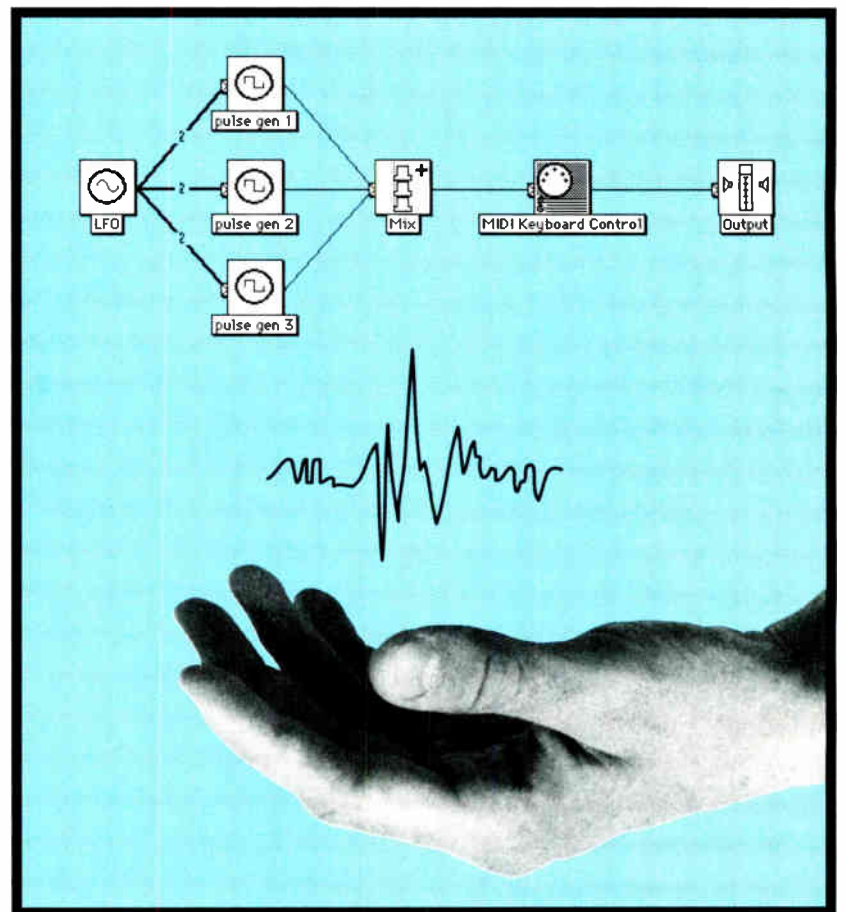
I would say that Barry had a knack for writing from the collective unconscious. He was tapped in. He would say things, and I would realize it was going to be next year's cliché. He would come up with "Night Fever"—it wouldn't be brilliant in a vacuum, brilliant in 1946 or today. But it was brilliant in its day. In retrospect, from a Hilburn view of the universe [Robert Hilburn, *L.A. Times* music critic], if you are not baring your soul you are not giving

as much, you are just a craftsman.

**Bonzai:** Let's take a group like The Eagles—making a monster comeback. What did you have to do with them?

**Galuten:** Not a whole lot. I played pinball with them at Criteria because we were working in the same studios. I played a little bit of synthesizer on *Hotel California*, some stuff that is not terribly audible. I did a lot of synthesizer work for their producer, Bill Szymczyk. I was fairly close to Don Felder and hired Don and also Joe Walsh for some records. Great guitar players.

# K Y M A



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**Bonzai:** As a synthesist, would you consider yourself a pioneer?

**Galuten:** Well, in the period I was recording, there were two major synthesizers: the MiniMoog and the ARP 2600. There were also those large exotic synthesizers, but I never used them. MiniMoogs had a fatter sound with a better pitch wheel and were more oriented toward soloists. The 2600 had patch chords and was oriented toward more complex sounds. For me, the ARP was an orchestration tool.

Most of my synth work took place after working for Atlantic and before I had success again as a producer. Though I was paying my bills as a synthesist, what I was really doing was producing people's records. I would add some interesting synthesizer, suggest edits. Half of the work I did was erasing the unnecessary parts and rearranging material. Now it's done in the mix, but back then before computers, it was more difficult. Someone would say, "I want congas on this song," and they would record congas from beginning to end. And they would do that with

every instrument—24-tracks were all the rage. My ability was to go in and erase things and restructure the song, clear up the vocal and the harmonies, come up with a few new parts. I was fixing records for people who had some studio time but were not organized.

**Bonzai:** You had 11 consecutive Number One hits. What period was that?

**Galuten:** When Barry, Karl and I were working on the Bee Gees records we were on a roll. All the Andy Gibb records would go to Number One, the Streisand records, the Dionne Warwick records, Samantha Sang, Frankie Valli. Barry would write a great song, we'd record it and it would go to Number One. This went on for a number of years. *Saturday Night Night Fever* alone had three Number One singles. Barry was just on, and we also figured out how to use multiple multitracks. We were the first people using drum loops.

**Bonzai:** Was this an electronic loop?

**Galuten:** No, it was a physical tape loop. It started when we were working in France on four songs for the film *Saturday Night Fever*. Dennis Brian, the drummer, had to go back to London because of an illness in his family. We wanted to keep recording, and we had already cut the track "Night Fever." So, I suggested to Karl and Barry that we take a bar out of "Night Fever" and just make a quarter-inch tape loop. Karl rigged it up, hanging the tape over mic stands. We took a great feeling bar, which we used for "Stayin' Alive," and then we used that same loop for "More Than a Woman" and slowed it way down for Barbra's "Woman In Love."

**Bonzai:** Was it interesting working with Barbra?

**Galuten:** She's an incredibly bright woman, and in the early years, she was not as in control of the recording studio portion of her career. I was just a guy from New York, and she was a girl from Brooklyn. I knew what her range was, determined the keys, hired the musicians, recorded the tracks. She came in for two weeks and sang everything, and that was it. Here's an interesting historical footnote: The duets from *Guilty* were created after she left.

**Bonzai:** What about working with Eric Clapton?

**Galuten:** Eric is one of the dearest

—CONTINUED ON PAGE 196

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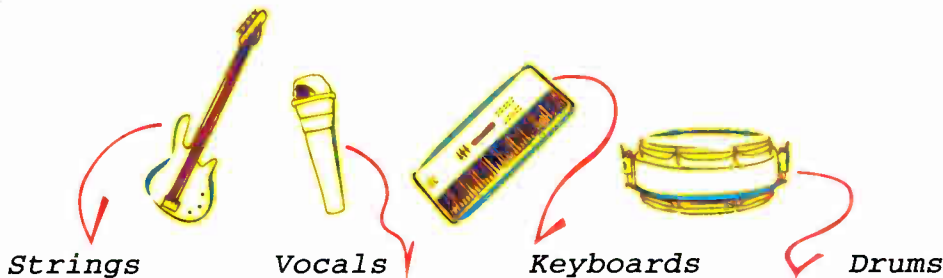


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*Keyboard magazine*

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## RECORDING NOTES



L to R: Richie Hayward, Bill Payne (front), Sam Clayton, Shaun Murphy, Paul Barrere, Kenny Gradney and Fred Tackett

## Little Feat

### A WHOLE LOTTA GUANK!

"No doubt about it, the chips were down," says Little Feat keyboardist/bandleader Bill Payne about the period before they began recording their excellent new album, *Ain't Had Enough Fun*. "We knew we had to deliver on this record." He laughs. "But we've been there so many other times during our career! It's the way Little Feat works, I guess." "Always a bridesmaid, never a bride" is probably overstating things a bit, but there is a nagging feeling that *commercially* Little Feat has never quite lived up to the expectations of the devoted core of fans (and record company types) who think the band is the coolest thing since mid-'50s T-birds.

You probably know the essential facts on the Little Feat rap sheet: Unquestionably one of the hippest

rock bands on the planet all through the '70s, the Los Angeles-based group brought together a loose blues sensibility, shadings of country music, a heapin' helpin' of New Orleans-style rhythmic funk, boogie-woogie, hard-driving rock 'n' roll, bits of jazz fusion and a whopping dose of nearly surrealist absurdity into one truly incredible package. They boasted two amazing guitarists—Paul Barrere and slide master Lowell George; two grooving percussionists—Richie Hayward and Sam Clayton—who played New Orleans rhythms as well as anyone from that city; the ultra-funky Kenny Gradney on bass; and one of rock's only true virtuoso keyboardists, Bill Payne. Over the course of seven highly eclectic studio albums for Warners (the essentials being *Sailin' Shoes*, *Dixie Chicken*, *Feats Don't Fail Me Now* and *Time Loves a Hero*) and one extraordinary live LP, the

Feat built a strong cult following and established themselves as many musicians' favorite group. The live *Waiting for Columbus* became the group's best-selling disc when it came out in the fall of 1977, but after de facto leader Lowell George died in June of 1979, the group disbanded.

The five surviving players enjoyed varying degrees of success through

—CONTINUED ON PAGE 111



Little Feat producers Bill Payne, left, Bill Wray, seated, and Ed Cherney



## Wilco

### A COUNTRY ALTERNATIVE

Three or four times a year, a CD by a band I've never heard of emerges from the humongous "to be listened to" stack that sits next to my desk and simply *d-demands* that I play it over and over. This spring, that CD was *A.M.* by a band called Wilco (on Sire/Reprise). Further investigation revealed that the group rose from the ashes of the beloved (but largely unknown to me) country-rootsy band Uncle Tupelo. And then, as usual, I learned that my great "discovery" already has a serious buzz surrounding it, having been one of the hits of this year's South-By-Southwest show and cracking various alternative playlists here and there. But don't let Wilco's "alternative" credibility throw you off. Musically—

and even attitudinally—this band has much more in common with the hip Gram Parsons/Burritos wing of songwriter-driven country-rock than with Smashing Pumpkins or PJ Harvey. But at least *someone* is playing this record—because mainstream country radio sure as hell isn't going to touch this.

Wilco is essentially a vehicle to showcase the enormous talents of singer-songwriter Jeff Tweedy. Tweedy's voice has an appealing, rough-hewn quality that's just perfect for the material he writes—slightly world-weary, no doubt chastened by experience. He sings in an almost off-handed way, half-speaking like Johnny Cash or even Lou Reed, but you can tell it's from deep in his soul. The support of the band—former Uncle Tupelo members Ken Coomer on drums, bassist John Stirratt and stringed in-



PHOTO: BRAD MILLER

L to R: Ken Coomer, Max Johnston, Jeff Tweedy, Jay Bennett, John Stirratt

strument whiz Max Johnston, augmented by guitarist Brian Henneman and steel guitar great Lloyd Maines—is always right on the money, too. These guys can sound like the Rolling Stones or Kinks one minute and some C&W outfit in a roadside bar the next, but Tweedy pulls it all together. I can't tell if it's a rock band

with country leanings or a country band with rock leanings, but they hit both areas beautifully, and the blend is seductive indeed. It's loose and low-tech all the way, but at least it sounds real.

The album was recorded and co-produced (with the band) by Brian Paul—  
—CONTINUED ON PAGE 117

### CLASSIC TRACKS

## Fleetwood Mac's "Go Your Own Way"

To mainstream America, it must have seemed that Fleetwood Mac came out of nowhere when they started landing songs on the charts in 1975. Relatively few knew that the band had been through eight years and as many lineup changes before founders Mick Fleetwood and John McVie hired two unknowns from the San Francisco Bay Area to join them and Christine McVie. The story is well-known and has been oft-told:

Fleetwood was in a studio called Sound City checking out the facility and the work of up-and-coming producer Keith Olsen,

when Olsen put on a new tape by a duo he'd made an album with in 1973 called Buckingham Nicks. Fleetwood flipped over the

tape and shortly thereafter hired the charismatic and talented Lindsey Buckingham and Stevie Nicks to join his band. Olsen got the nod to produce the quintet's first album, and a few months later, *Fleetwood Mac* came out and slowly but surely began insinuating itself on the American public. Christine McVie's "Over My Head" became the group's first Top 20 single in November '75, followed the next spring by Stevie Nicks' "Rhiannon" (which made it to Number 11) and McVie's "Say You Love Me" (also Number 11) in the summer. The album went on to sell more than

—CONTINUED ON PAGE 118



PHOTO: HERBERT WORTHINGTON

Left to right, Mick Fleetwood, Stevie Nicks, John McVie, Christine McVie and Lindsey Buckingham

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—FROM PAGE 108, *LITTLE FEAT*

the 1980s (Payne, in particular, was an in-demand session and tour player), but by 1988, they were itching to play together again, so they reconvened and added two new members—guitarist Fred Tackett, who played on a couple of Little Feat records in the '70s and was already considered "family," and singer/songwriter Craig Fuller (of Pure Prairie League fame), whose vocal style bore an uncanny similarity to George's. The first album by the revived Feat, *Let It Roll*, was an unexpected triumph. Produced by Payne and George Massenburg, it succeeded in recapturing the band's old fire and spirit, and it contained a handful of tunes that stood well with the best songs from their catalog. Live, the group showed it could still *kill*, with Fuller handling George's vocal parts ably and the other players meshing into a tight unit that actually surpassed the old band from a strictly musical perspective. Their next two records, *Representing the Mambo* and *Shake Me Up* (both co-produced by Payne and Massenburg), weren't as successful musically or commercially (Payne jokingly calls the latter disc, on the fledgling Morgan Creek label, "our secret album"), and then Fuller left the group, leaving the others wondering, "What next?"

The answer came in the form of someone who'd been in their midst for years: singer Shaun Murphy, who sang backups on the last three Feat records (after years on the road backing people like Bob Seger, Eric Clapton and Bruce Hornsby). As Payne says, "Paul [Barrere] and I kind of looked at each other one day and realized that Shaun might be exactly what we needed. She's an incredibly great singer. I've worked with literally the best there are, and she's every bit as good as any of them. What having her join the group did for me as a writer is it opened things up so I didn't have to worry about range anymore. We could have somebody hit vocally as hard as we play musically. It gave us all a lot of freedom."

After going on the road with Murphy last summer as part of a blues tour package headlined by B.B. King, the group decided that the time was right to go into the studio to capture the new lineup's explosive energy and enthusiasm. They signed with a new label, Zoo Entertainment, and brought in two other heavy hitters:

New Orleans native Bill Wray is a songwriter, singer and producer who has worked with acts ranging from Zachary Richard to Diana Ross and has made his own records; and producer/engineer Ed Cherney is one of L.A.'s most in-demand recordists, having cut the last two Bonnie Raitt records (both Grammy-winners) and many others. Wray practically became a member of the group in the weeks before the band started recording. He helped write nine of the 13 songs that made it onto *Ain't Had Enough Fun* (at 70 minutes, there's a whole lot of music) and proved to be a guiding spirit throughout the recording.

"Bill Wray was a real big part of this record," Cherney comments. "He was sort of the Song Police—he made sure the songs were all workin' and happenin'. He came up with some great arrangements—going to solos in odd places, having odd numbers of bars, keeping the surprises coming and keeping it all swinging. I think Bill Payne was the Note Police on everybody in the band, and of course in a lot of ways, he's the guy with the vision, though everybody collaborates. And I just filled in wherever I could," he adds with typical understatement. "I pay attention to tempo and performance, try to get it all down on tape."

"The elements of Bill Wray, Shaun Murphy and Ed Cherney, in and of themselves, were really what made this album different from anything we've done before," Payne adds. "It was a real comfort zone for me as a producer on the record and as leader of the band, to go out there and actually play, and not worry so much about where we were going with something. We had ample time to rehearse it, so when it came time to record we just went in and did it—just *played*."

"Primarily, what I wanted to do was to capture performances," Payne continues, "which obviously you try to do on a record anyway. But because the way we were recording with George [Massenburg]—which wasn't so much because of him, so much as the way we as group were capable of putting things down on tape—was sort of piecemeal, with a lot of bass and drum overdubs, I wanted to write music that would be performance music, and good music to boot. We went for performance over perfection. With George, we

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tried to get things a little too tight, which was maybe too perfect for the way we really play.”

After the arrangements had been worked out through extensive rehearsals at Payne’s house, the band, Wray and Cherney checked into Ocean Way Studio A in Los Angeles, site of historic sessions for everyone from Phil Spector to the Beach Boys to Frank Sinatra to...yes, Little Feat, who cut their first album there nearly 25 years ago. The control room is equipped with a Neve 8108 console, and the big recording room is famous for both its warmth and the rich sonic detail it allows.

“We cut it analog, as live as we possibly could,” Cherney says, “with just a little bit of isolation, but live vocals, live piano, keyboards and whatever Billy Payne was doing; live drums, percussion, bass, two guitars. I’d say 90 percent of the performances are live. We may have fixed a solo here or there, added a keyboard part, and did some vocal fixes and added some background vocals, horns, but that’s about it. This is as close to a real live record as you can get. I used *Waiting for Columbus* as a template. I’d listen to ‘Fat Man in the Bath tub’ or something.

“I’ve been a Little Feat fan forever,” he continues, “and I knew that the way the chemistry happens in this band is that things happen fast. The moment’s there, and you better get it. So I knew I wouldn’t have a lot of time to get sounds. My main concern was getting this thing to tape—get a good headphone mix for everyone and have that red button recording as soon as they were in the room. I get it down quick. I try not to beat up the band. I try to be there and as unobtrusive as possible to make myself as invisible as possible and more importantly, to make the *process* as invisible as possible, so the music is goin’ in as straight and clear a path as it can. I’ll sacrifice some technical things—‘Oh, I wish the snare was a little deeper, or this was a little better’—knowing that the feel and the immediacy is what really matters.”

“There are a lot of great engineers,” Bill Wray offers, “but the thing with Ed is, if we had the band in the right mental state to get a tune, I’d look at Ed, and he’d be ready, and he wouldn’t be worrying about the snare or the keyboard or some leakage, because he understands about gettin’ that moment on tape.”

“He’s very, very quick,” agrees Bill Payne, “and it’s almost like you didn’t know he was there at times, which is a compliment to him, because it didn’t interfere with what we were trying to do, which was learn the songs and play them as well as we could.”

Because they were working relatively fast, Cherney kept things fairly straightforward technically. “I had everyone around the drums, except for Shaun, who was in a vocal booth,” he says. “But everyone could see each other well; it was very intimate. I went for real simple miking on the drums. I used 57s on the toms, I got a couple of C-12As that I used for overheads, with Mastering Lab mic pre-amps. I had B&K 4011s on the snare and hi-hat and a couple of M50s for room mics. I used those far and high, but I also used some [Neumann] 67s that I miked up from the floor, looking up at the toms from in front of the kit. The reason I did that is that Richie tends to play a lot of cymbals; he gets a lot of groove happening up on top. The overheads took care of a lot of the high end, but I was also listening to the bottom end of the drums, so those [lower mics] came in handy. What you hear is probably 75 percent room mics.” For Clayton’s impeccable percussion parts, Cherney set up two 67s and two C-12s to cover the varied textures. Clayton’s vocal mic was an 87.

For Barrere’s and Tackett’s guitars, “What I tried to do is go out and listen to their amps, because they have their sounds,” Cherney continues. “I tried to duplicate what was happening with their amplifiers. Fred was using different Fender amps, and Paul uses this Rivera stuff. Basically, I just found the sweet spot on their amps, then used 57s along with a couple of 414s back as room [mics] for a little ambience.” Gradney’s bass was a combination of DI and a 57 on his cabinet, and with the exception of acoustic piano, Payne’s keyboards were direct as well. For Murphy’s vocals, Cherney mainly used a Sanken C-41.

“The band was very well-rehearsed,” Cherney notes. “Typically, we’d run down a song a couple of times to find a tempo and try to establish the groove. Then, we’d usually have the songs by the second take, third take, fourth take at the outside; it would usually be one of those. We might cut it a few more times but go back to one of the earlier takes where



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the moment was there—that undefinable *guank*.”

The undefinable what?

“The guank, man!” says Bill Wray with a laugh, his New Orleans accent thick as moss on a live oak. “Ed and the others picked up that word from me; I’ve been usin’ it for years. What is it? Well, there’s the marrow of the bone, and then there’s a little strip in there that’s called the ‘guank.’ It’s as deep as you can get into the soul. I’d cut up with the band and say, ‘Man, don’t have any guank on that one!’ It was a way to make fun without having to say, ‘That’s out of tune’ or ‘That’s no good.’” So guank is a good thing? “Oh yeah, you *want* it to have guank!”

“Bill was in charge of the guank meter,” Cherney chuckles. “He kept it light and fun, but he also knew how to help the band get down to business. If this record is really successful, I think Bill Wray is the guy who has the most responsibility for it.”

“It *was* a lot of fun,” Wray says. “I’d tease Richie and say, ‘Man, there’s this drummer named Richie Hayward—you oughta play it like him!’ And he’d throw a stick at me. I

did that kind of stuff with all of them. Basically, I was just trying to get them back to what they’re best at. I felt like it was part of my job to help them find out what’s really them. They were teasin’ me, sayin’ that I put the foot back in the Feat. That’s what I was tryin’ to do!”

After tracking was completed, the band moved over to Jackson Browne’s Groove Masters studio for overdubs, including the wonderful addition on a few songs of the so-called Texicali Horns—sax players Joe Sublett and David Woodford, and trumpeter Darrell Leonard.

For the mix on Brooklyn Recording’s Neve 8068, Cherney says, “I wanted to get it clear and have some definition on the low end but still have some snap on it. There’s a lot going on in this band—two or three guitars, a bunch of percussion, Richie swingin’ on the drums and Kenny playing some sort of bass line. You might have piano, synthesizer and B-3 and vocals. To get all that clear so you can still hear the personality of the players is really hard. With a band like Little Feat, you don’t want to go for a wall-of-sound approach. But it’s

hard to get all the detail: There are all these little licks in there.

“I tried to keep a fairly organic and live approach. I got a couple of Eventide SP2016s I carry around. One of them I’ll use with a Pultec, and there’s a real good short, fairly bright room sound in that, and there’s a really natural stereo room in the 2016 that I like a lot. Also, instead of reverb on some things, I’ve been using a Spatializer to try to get some depth. I’ve been able to maybe pull the vocal or some other thing a little forward. I’m not using it to make any kind of big statement or any big wide effect, but to clear more space and give myself some more colors on my palette.”

Whether *Ain’t Had Enough Fun* will finally be the hit this great band so richly deserves is now up to the fates (which could mean any of several factors in the record biz). But one thing is clear: By reinventing themselves one more time, Little Feat has made a disc that both builds on and broadens their already-noble legacy. The interplay of the musicians and singers on the new record is something to behold; this is a group

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effort in all the best ways. Shaun Murphy is a major find, no doubt about it, a tough-mama belter who oozes soul. But Payne and Barrere are singing better, too, and Barrere's slide work has never sounded more confident and emotive. The songs ride on one infectious, cracking groove after another, and melodic hooks abound. Want to hear the next Little Feat classics? Check out "Drivin' Blind," "Blue Jean Blues," "Cajun Rage," "Heaven's Where You Find It" and "Borderline Blues" for starters. This stuff has got the mojo, the guank and that unmistakable Little Feat *thang* in spades.

"Being with these guys is like being with a real rock band," Cherney says. "It's hard to define, but you know it when you see it. I just got back from Japan with the Rolling Stones, and they've got it, too, obviously—they're a real rock band. Little Feat is the real deal."

"I've always said this band was like an experiment in terror, but I wish we weren't so close to the truth on that," Bill Payne says with a laugh. "But this is going to be a very good year for Little Feat. Everything seems to be pointing that way." ■

—FROM PAGE 109, WILCO

son, who engineered and produced the final Uncle Tupelo album, the live-in-the-studio *Anodyne*. Paulson, who cut his chops working side by side with Chicago alternative recordist Steve Albini, says, "Most of the first half of the record comes from demo sessions we did for Warners, which we knocked out in two or three days at Easley Recording in Memphis. The rest of it we did over about a two-week period [at Easley]. It's basically live, though there are a few overdubs and drop-ins."

Easley was the one-time home of the legendary Memphis band The Bar-Kays, but in recent years, it has built strong credentials in the alternative world. "It's old and funky, but it's got a nice live sound," Paulson says. "It's got this Spectrasonics console that's pretty funky; sort of an early transistor-y sound that's a little harsh. But it was fine for what we were doing. I'm into big ambient sounds, and Easley has a very high ceiling. I'm tired of the sound of finely tuned studios on records. I find the sound of a kitchen or living room much more interesting," he says with a laugh.

Paulson says that while he does have some mic preferences, he was content to use whatever was on hand at Easley for these sessions. These included a Sennheiser 409 on Henne-man's guitar amp; 421s on toms, an RE20 on the kick, a 57 and a Shure 98 on the snare, and C-37As for overheads; 414s as room mics; a 57 about 30 feet away from the drums "for some splash"; and either a 251 or 414 on Johnston's arsenal of banjos, mandolins, dobros, etc. The bass went direct, and Maines' steel overdubs were a combination of a DI and either a Beyer 130 ribbon mic or a 57 on his amp. Tweedy's whiskey-and-cigarettes vocals went through "a \$25 Telefunken 251," Paulson says. "The Easley boys lucked out: They bought a pair of Telefunken 251s at an estate sale. This woman only wanted \$25 for them, but they couldn't do that to her, so they gave her a hundred bucks. Some of these are going for eight grand apiece!"

Of working with Maines, Paulson says, "He's an absolutely amazing person. He walks into the studio, and he's ready. He gets down to business, and he really knows how to get to

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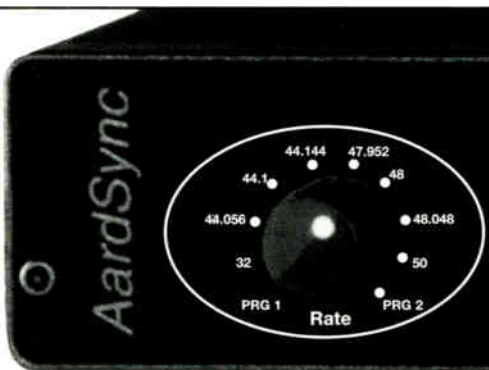


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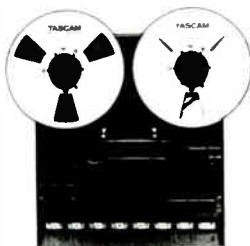
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the core of a song and work with it."

For the mix, the band's management and record company suggested using Richard Dodd, whose work on Tom Petty's fine *Wildflowers* LP is all over the airwaves these days. "To be honest, it scared the hell out of me at first because I'd never done anything like that before," Paulson says. "But it let me work with a new engineer and get some new ideas rolling. Richard was great. Philosophically, they couldn't have picked a better person for me, because we're both kind of anti-reverb, and we want everything to sound real natural. It was nice to get a fresh perspective. I really admired the way Richard would dig into a song and find out what made it work—which was usually Jeff—and then build it from there." Dodd did his work at Masterfonics and Emerald Studios in Nashville; Paulson mixed three songs at Battery Studios in Nashville.

Although Paulson says "I'd be happy spending the rest of my life making Wilco records," he's, of course, moved on to other projects, including the forthcoming solo album by Uncle Tupelo's other leader, Jay Farrar. Meanwhile, Wilco has hit the road promoting *A.M.*, trying to turn that buzz into a roar. ■

—FROM PAGE 109, FLEETWOOD MAC

four million copies, establishing Fleetwood Mac as one of the biggest bands in America, and Keith Olsen as a top producer.

As that album was making its slow, steady rise up the charts, the band was already beginning work on a follow-up. The group had a falling out of some sort with Olsen, and two other choices—Deke Richards and Kelly Coteras—didn't work out, either. So they looked in-house, as it were, and tagged their live sound engineer, Richard Dashut, to produce and engineer the new record. Dashut's background was actually in studio engineering rather than live sound; in fact, he cut his chops at Olsen's side and was working on the second Buckingham Nicks album when Lindsey and Stevie (who were even Dashut's roommates) abruptly dropped the project to join Fleetwood Mac.

"After they joined Fleetwood Mac," Dashut remembers, "I went through a period of minor bitterness, only be-

—CONTINUED ON PAGE 198



# SOUND CHECK

## Alan Parsons & Stephen Court

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by George Petersen

# SOUND CHECK



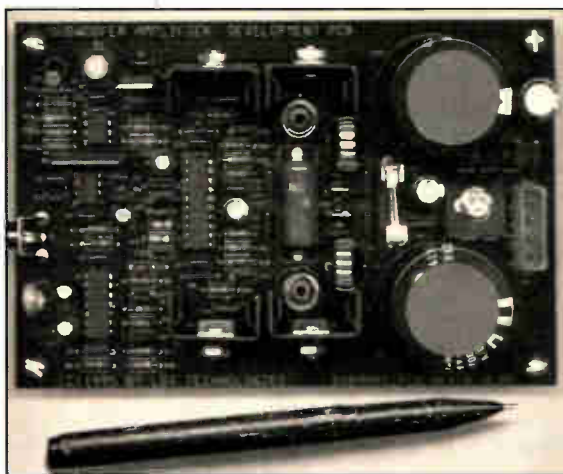
Soundcraft K-1

## NSCA EXPO '95 PRODUCT HITS FROM INDIANAPOLIS

Gray skies and the occasional thunderstorm rumbling through the Midwest couldn't put a damper on the 6,000 attendees at the 15th annual meeting of the National Systems Contractors Association. Held in Indianapolis from April 28 to May 2, 1995, this year's Expo continued with the theme of diversification that began with NSCA's 1994 name change from "Sound Contractors" to "Systems Contractors," a phrase that more accurately describes the role of most NSCA members.

This year, a record 400 exhibitors showcased products in the commercial sound and video, residential electronics,

protective technology and tele data communications industries. Obviously, *Mix* readers are



LGT Class-D Pulse Width Modulation Amp

interested in cutting-edge sound reproduction and reinforcement systems, rather than intercom, security, CCTV, paging, entry-access and nurse-call systems, so here are some new pro audio products that caught my eye.

Big developments don't always come in large packages. LGT Technologies (dist. through Acoustical Supply International of Chattanooga, Tenn.) demonstrated its line of Class-D, Pulse Width Modulation amplifiers with switching power supplies. PWM amps are nothing new, but the company's 8-ounce (less transformer), postcard-sized, 400-plus-watt amp modules are worth a look. The product is ideal for powered speakers, and LGT has developed an amp module that includes an active 24dB octave crossover for subwoofer applications. A 1,000W version is in the works, and a number of leading speaker manufacturers are said to be looking at LGT's OEM possibilities.

Soundcraft (Northridge, Calif.) showed two new low-cost mixers for music and live theater applications. Available in 32-, 24-, 16- and 8-channel versions, the K-1 is a 4-bus model with 4-band (sweepable mids) EQ, six aux sends and input phase-reverse switching. The 8-bus K-3 comes in 16- to 48-channel versions and has eight aux sends, four stereo returns and a "C3" (Console Control and Communi-

—CONTINUED ON PAGE 124



Miles MTI-3 TriSonic Imager



## TOUR PROFILE

# Sarah McLachlan's Theater Tour

## MIXING HARD-TO-REACH PLACES

by Barbara Schultz

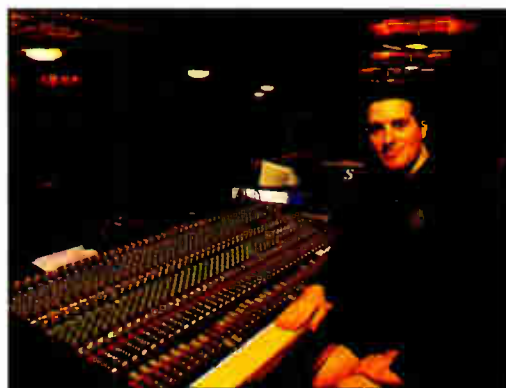


**S**arah McLachlan, her band and her crew have been on the road, playing theaters for the better part of the past year-and-a-half to support her latest release, *Fumbling Towards Ecstasy*. So, McLachlan's front-of-house mixer, Gary Stokes, has learned a thing or two about mixing theaters. *Mix* caught the show at San Francisco's ornate Orpheum, which is used more often for stage plays than for rock shows.

The tour is out with a system—supplied to them by Vancouver's Jason Sound Industries—that is centered around a Crest GT 32-input console. "It's probably a small console for this type of act," Stokes explains. "Most people come into these venues with a larger console, but I give the sound company

weight and size restrictions because I find that one of the biggest disadvantages in touring theaters is coming in with a concert system that is designed to be set up in an arena and then being relegated to the back row, under the balcony, because all of your equipment is so bulky that if you put it anywhere else, you'd kill 60 seats. Most engineers like mixing theaters, as opposed to arenas or bigger halls, because they sound more pleasant, and I think generally that is true, but the big drawback that most people run into is they have a far less than ideal mix position. There's 20 or 30 seats in the house that sound nothing like the rest of the room.

"So, I've scaled down all of the FOH equipment sizewise to where I can set up in the middle of the house, over the top of about 18 seats, and kill zero sightlines. I can do that by using four or five small nine-space racks for outboard processing, and I use the Crest console for



FOH engineer Gary Stokes

PHOTOS: STEVE JENNINGS

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Sarah and another small console for opening acts. That also allows me to set up the FOH with just one or two stage hands. We don't have to carry over seats or get the whole crew out there. And mainly the audience benefits because obviously it's a lot better-sounding show if the engineer can hear what the speakers sound like in the house."

The speakers are a proprietary Jason Sound system: two of the company's J63s per side for mid-high, two J31s for low-mid program and two for subprogram. The tour is also carrying eight of Jason Sound's smaller trapezoid J23 boxes, which can be used for fill or delay. "More often, it's down fill or feeding off to the sides," says Stokes. "Sometimes we fly them off of a lighting truss to do loges and small alcoves off in the sides of the room that are awkward to get at." And, to round it out, Stokes brought along four EAW JF80s for under-balcony fills and stage-left fills. He says "they've become invaluable for keeping sightlines down and being able to spread a little extra high frequency in the near-field in the hard-to-reach areas."

The most challenging, and important, part of Stokes' mix is, of course, McLachlan's romantic and powerful vocal, which is usually miked with an AKG C535 condenser, though she has used a Neumann KMS150 for some of the nights and likes it quite a bit. After that, the vocal goes to a Millennia Media HV3 preamp. "We split the feed between monitors and house after the mic preamp," Stokes explains. "just to avoid a lot of potential loss of level that might happen otherwise and, from there, it splits to the monitor desk and also goes to the house, and in the house, we use BSS 901 dynamic equalizers, just to trim a couple of interesting nodes that Sarah gets into. She can really create loud, resonant frequency peaks at different frequencies—just on one word or one vowel—in a way that no other singer I've ever worked with other than, possi-

bly, opera singers has ever managed to do.

"And I think her dynamic range is probably wider as a solo performer than most bands I've ever worked with could manage. So the 901s help a lot controlling a couple of frequency peaks that can get annoying once you start amplifying that to several thousand people."

From there, McLachlan's vocal goes into a Tube-Tech dual-channel compressor, and Stokes finishes it off with a parametric

EQ. "I've been using Rane SP15s," he says. "I really like those because they're very user-friendly. They're easy to grab in the middle of the show in the dark, and they have an excellent shelving filter on the bottom end. I have also been trying a new Amek 9098 Rupert Neve EQ. It sounds a little nicer in the top end than the Ranes, but comparatively, it's pretty minimal as far as live applications.

"And then it just comes back into the console, line-level. It's

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strictly in-line from the mic pre through that processing chain, and then back line-level to the console. That's very effective because it gives me a really consistent reference point so that I know the noise floor and I know everything is under control right from scratch, and then I can build everything else up in the console—the band and effects and what-have-you from there. And then, of course, I have to contend with more of a rock high end on the dynamic range in terms of how loud the band can get onstage."

As far as the band goes, Stokes is using AKG C535 mics on most of the backing vocals, including singer Camille Henderson's harmonies, which help McLachlan achieve the kind of textured vocals that can be found on her recordings. The bass guitar (played by Brian Minato), electric and acoustic

guitars (by Luke Doucet, David Sinclair and Sarah herself) are all DIs with Shure Beta 57s on the cabinets. For drummer Ash Sood's DW kit, Stokes uses AKG C747s on the toms, a Neumann KM150 for the snare; the kick drum is with a Beyerdynamic M88, and the overheads are Audio-Technica 4051s. Hi-hat has been, alternately, an Audio-Technica 4053 or 4051, or another Neumann KM150. Sood's vocals are miked with a Sennheiser headset mic.

The keyboard player, David Kershaw, has a fairly elaborate rig centered around a Roland MIDI controller and a MIDified, two-tiered Korg BX3 organ. He plays both into an Akai sampler, a Kurzweil K2000 sampler/synthesizer and a number of other modules, and he mixes it all through a Mackie 1604. From there, it's a stereo out to Stokes, though the organ also goes to a Leslie that is miked with a

Beyerdynamic M88 on the bottom and a pair of AKG C535s at the top.

Some of the bandmembers use Jason J17 wedge monitors; the others have in-ear systems. McLachlan's in-ear wireless monitors are from Radio Station. Dave Pallet mixes monitors on a Soundcraft SM24 48-input desk. Gord Reddy, the system technician rounds out the three-man crew for this rock show that is not exactly a rock show.

"I don't think, overall, we mix the vocal so hot that it doesn't sound like a conventional pop mix," Stokes says. "It's just that the dynamic range of her voice and the importance of her voice, I think, to the average audience member, just calls for much more of a classical approach to signal-to-noise. You've got to hear her breath in the back row." ■

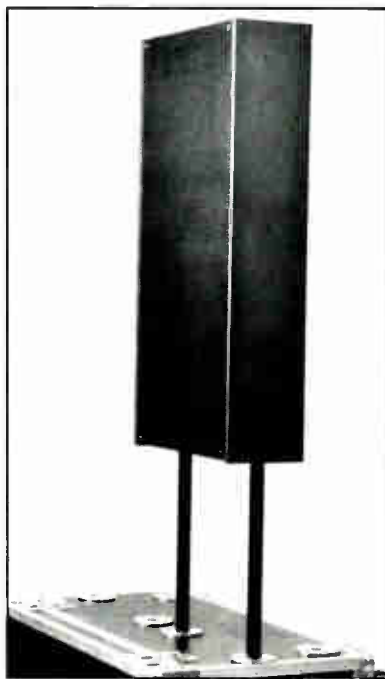
*Barbara Schultz is Mix's copy editor.*

—FROM PAGE 120, NSCA

cation) with 128 mute group scene presets and a DataFader for sending continuous controller commands to MIDI devices. A 12x8 matrix is optional.

In other console news, Crest (Paramus, N.J.) announced that it has started deliveries of the Century Vx console, which features an 8-channel VCA system, true LCR panning and fully balanced buses on all eight aux send systems.

We're still a half-decade from 2001, but thanks to MacPherson Audio (Lansing, Mich.), we finally know what the famed "monolith" from Stanley Kubrick's classic space tale really was. Housed in a narrow, tall enclosure (43x22.5-inch), the MacPherson Monolith provides full-range (40-17k Hz, ±3dB) and high-output (124dB max) FOH performance from a cabinet that's only 8.5 inches deep. Although this three-way (bi- or tri-amp) system may resemble the shape of an electrostatic speaker, Monolith uses proven technologies: large-cone, shallow-basket woofer, cone midranges



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NSCA just isn't NSCA without ceiling speakers, and there were plenty to be found. However, when Eastern Acoustic Works (Whitinsville, Mass.) decides to do a ceiling speaker, it's sure to be something special. EAW's Concentric Phase Aligned Array® turns the concept of conventional coaxial speakers inside out. A typical co-ax has a large-cone woofer that surrounds a compression driver with a small horn flare. The CPAA approach uses a large, symmetrical horn flare coupled to a compression driver. And inset within the outside edges of the horn are multiple, small-diameter, cone LF drivers, whose outputs combine to create the effective surface of a 21-inch woofer. The entire system is designed to install into standard 24-inch-square ceiling grids, and its high-SPL output is a symmetrical 60°x60° pattern. Airports and waiting rooms may never sound the same.

Having found success in the



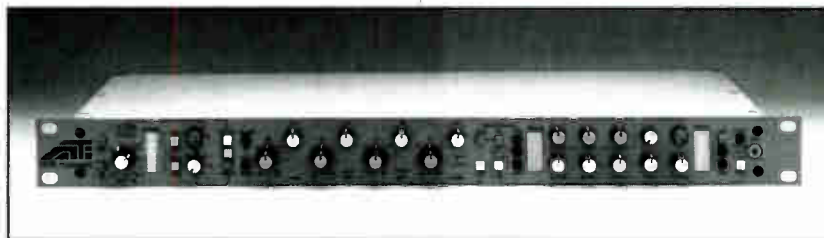
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I rarely get excited about karaoke mixers, but the Model KM707 from Gemini (Carteret, N.J.) offers something different: The mixer has three mic inputs with onboard echo effects, a built-in pitch transposer can move the input source up or down an octave (in half-step increments) without changing

the tempo, and the unit has a switchable "spatial widener" function on its output. Additionally, the unit's CD input has a switchable vocal-remover feature that takes out the lead vocal from many standard-issue stereo CDs, providing the user a wider range of material to choose

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Miles Technology (Niles, Mich.) debuted its MTI-3 TriSonic™ Imager (\$499), which enhances the playback of stereo sources by taking center-panned sound



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sources in the mix and routing them to a center-channel output. In addition to its left, right and center outputs, the unit includes two surround outputs; if surround is not required, these can be set to become independent mono outputs for lobby or video feeds. Front-panel controls allow tailoring and optimizing the

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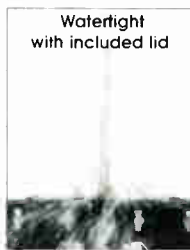
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sound, and a SpreadSound™ function can be used to widen the apparent soundstage.

The clear winner in the Silly Name category goes to the Tannoy "Arena" Series. Such a name may conjure up visions of a gargantuan system designed for high-SPL applications and grueling touring conditions, but the Tannoy Arena is actually a 5-inch, mag-shielded driver mounted in a molded enclosure for distributed foreground or background music systems. Max SPL is 109 dB; 60-watt (with 70V transformer) and 15-watt (low-impedance) versions are available. Retail is \$99.

One noticeable trend at NSCA was the number of speaker companies looking into the cinema market. It was once the unrivalled domain of the venerable Altec A-7, but JBL has made significant inroads over the years; now Peavey, Apogee and EAW are getting into the act. In fact, EAW recently agreed to outfit 140 theaters from the AMC chain with state-of-the-art playback systems.

Overall, NSCA was a success on every level. Although there were more than 400 exhibitors, the show size didn't get out of hand, thanks to NSCA's strict 8-foot booth space limit. And Indianapolis proved to be an ideal host city, with a large, modern convention center connected to two sizable hotels. For a quick lunch escape, you could cross the street, slip into the Hoosier Dome and watch the Colts practice while you munched a hot dog in the stands. Dat never woulda happened in New York.

There were other hot products at NSCA, and we'll present these in our new-product columns in the months to come. Meanwhile, NSCA Expo '96 is slated for May 13-15, 1996, in St. Louis. For info, call (800) 446-NSCA or (708) 598-9777. ■



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**BY ROD JAMES**

Nashville has always represented the heart and soul of country music. Clear-channel broadcasts of the original "WSM Barn Dance" in the 1920s helped establish an indelible link that eventually spawned the city's appropriate "Music City USA" moniker.

By the mid-1940s, the old Barn Dance had officially taken on the more familiar name of the Grand Ole Opry and had moved to the fabled Ryman Auditorium, its beloved home for more than 30 years. In 1974, the Opry moved to a new performance hall—the Grand Ole Opry House at Opryland USA.

The Grand Ole Opry House is recognized by performers and fans as the world's premier country music venue, and the Ryman Auditorium, refurbished in 1994, continues to thrive as a concert/performance venue. Another Nashville venue, the Wildhorse Saloon, highlights more recent developments in the country genre.

All three facilities feature new audio systems developed by a cohesive team of designers and installers. Their combined expertise, along with custom JBL loudspeakers, UREI digital signal processing, Crown IQ System control and other audio upgrades have resulted in superb systems exceeding all expectations and providing a high degree of flexibility.

The three venues are owned by the Gaylord Entertainment Group, with systems implemented under the direction of The Nashville Network (TNN), a Gaylord subsidiary. TNN's Conrad Jones oversaw the projects, with the network's Shipley Landiss serving the integral role of project engineer. Craig Janssen of Acoustic Dimensions, Dallas, supplied system design and testing in combination with Landiss, while Dave Callahan of Signal Perfection Limited (SPL) of Columbia, Md., managed the install.

The three new systems were implemented virtually simultaneously and done on the fast track. Much of the design work occurred electronically, with the team members exchanging files via

modem. "Very little paper was used in the design process," Janssen notes. "SPL was well set up to accommodate this 'higher tech' design process."

SPL's Callahan spent a considerable amount of time on-site at all three venues, managing the hands-on engineering of all system design goals and heading an installation crew made up of TNN engineering staff and local contractors.

Many system components at the Opry, Ryman and Wildhorse are virtually identical and therefore interchangeable. "This was a requirement, and a very good one," Janssen says. The application of components and their tailoring to meet the distinct needs of each space, however, was a different story. The Opry system was the last of the three to be completed and is the most elaborate.

"The Opry House is a very unusual space. There aren't many rooms like it in the country," Janssen says. "But from an acoustic standpoint, it's well-suited for what it's designed to do." More than 50% of the room's 4,000 seats are located in the steeply raked balcony, wrapping more than 170 degrees around the front stage, creating an unusually wide audience area. The ceiling stretches more than 100 feet above the main floor and is somewhat reflective, with more reflections created by angled brick walls flanking the rear of the balcony.

Two primary acoustic concerns were reducing ambient noise levels and controlling an enormous amount of sound energy coming from the stage. Ambient noise was lowered by re-balancing the HVAC system, moving a compressor that had been under the stage and enclosing the amplifier racks in a custom room above the theater.

Enclosing the racks proved to be a particularly interesting facet of the project. SPL, working with Landiss, designed the insulated room, which was split into six sections that were then hoisted into position with less than 1/8-inch tolerance for error. An air-conditioning duct into the room maintains a cool 55-degree temperature.

All of the effort proved worthwhile, with the noise floor cut from more than NC-35 to a manage-



PHOTO: DONORSE REACH/STUDIO CITY OF OPRYLAND





*Above: viewing the stage from the house mixing position;  
left: the Paragon ATI 56-channel house console  
below: The Opry House in full swing*



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able NC-25.

Panels in the grid above the stage were found to be one of the prime culprits in directing stage monitor sound to the balcony, with skewed frequencies and a 40-millisecond delay. Replacing these with acoustically absorptive materials essentially eliminated the problem.

Further acoustic attention was addressed through the audio system design. The goal was simply to provide a system free of excessive, problematic echoes.

The previous sound system—a single central cluster loudspeaker design—presented some drawbacks. With the extreme angle of coverage in the room, there was no way for the cluster to adequately blanket side seats without putting tremendous energy on stage. The cluster also provided a monophonic feel. Even when left/right touring rigs were brought in, results were disappointing, due in part to difficulty in achieving the proper mix balance.

The new design employs four main/front loudspeaker clusters in a “right-left, right-left” stereo configuration. Stereo imaging is provided

throughout the house, along with exceptional vocal clarity. “Wherever you might be, you get coverage from two clusters, always being within the proper range of a left and right,” Janssen explains. “This way, there are no holes in the image. You don’t walk in and out of stereo coverage, and there is no sense of image shift.”

Extensive testing and study had shown that successful implementation of this design required tight pattern control in both vertical and horizontal planes. Tonal consistency of all components was also key, even for the delay speakers.

The design team worked closely with JBL on development of these “dream loudspeakers.” Gary Hardesty, director of the JBL Systems Group, headed the effort, with Mick Whelan at the Northridge facility and Chris Foreman of the Nebraska plant supplying their respective expertise.

Whelan oversaw development of 10-inch cone-loaded, constant-directivity midrange horns for the short-, medium- and long-throw loudspeakers in the four main clusters. “A horn-loaded midrange is somewhat unusual for a room of this size, but it was

vital for providing good pattern control and intelligibility,” Whelan says. The three-way, medium-throw loudspeakers also include a JBL 2206 12-inch woofer, while high frequencies are provided by a JBL 2352 horns with 2451 drivers. The three-way delay loudspeakers are identical, in terms of cabinet design and components, to the main cluster medium-throw loudspeakers.

The low-frequency section of each main cluster, developed under Foreman’s direction, also features an unusual design. Four woofers are loaded in a vented cabinet in what appears to be a vertical column array, with two JBL 2206 12-inch woofers sandwiched between two JBL 2226 15-inch woofers. The spacing of the drivers, as well as the proprietary signal processing, provides good on-axis coverage, with off-axis cancellation and much less energy on the stage. Taken as a whole, the loudspeaker arrays are at least 12 dB down at 90° off-axis above 100 Hz.

Custom subwoofers are encased in the grid between two very solid walls. Each of the four sub cabinets is loaded with two JBL 2242 18-inch woofers.

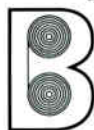


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SPL's Callahan and a team of riggers from TNN took special care in flying the loudspeakers. A design criteria called for hanging angles to come within two degrees of the spec, leaving little margin for error. SPL developed an adjustable, universal hanging bracket (also used at the Ryman and Wildhorse), allowing the loudspeakers to be rotated up to 180°.

Both front-fill and underbalcony loudspeakers for shadowed areas are also custom, each loaded with a single JBL 6-inch woofer and 1-inch compression driver on a small-format, CD horn.

Crown amps power the entire house system, with Macro-Tech MA-3600VZs on the lows, MA-2400s on mids and MA-1200s on highs. The Macro-Tech Series amps were selected for fidelity and reliability. The MA-3600VZ has circuitry allowing it to dynamically adapt to signal and load requirements. The result is stable power matching to any load.

Macro-Techs were also selected for their computer-control capability via the Crown IQ System. With the amps removed to the room above the loudspeaker grid as part of the ambient-noise abatement, this control capability proved vital. "We looked at our options and decided that Crown was an established company in the computer-control realm with a solid track record," Janssen says. "The client was comfortable that Crown could deliver a useful, reliable product."

A 486 PC at the mix position, linked via an IQ interface to the amps (equipped with plug-in, IQ-P.I.P. modules on battery backup), is loaded with IQ Turbo software. This provides high-speed operation and offers the option of a user-friendly, graphics-oriented format. The user can literally create any object on the screen that corresponds to the device being controlled.

For further ease of use, an AMX LCD touchscreen is linked to the IQ System. The touchscreen provides quick system on/off, signal routing and flexibility with regards to the matrix mix.

The Paragon ATI 56-channel house console was retained from the prior system, providing plenty of capability and excellent sonic quality. The design team added more mix control by running the outputs through a Midas XL-88 matrix mixer located in the equipment room. Each loudspeaker group (short-,

medium- and long-throw, underbalcony, delay, and front fill) has its own separate matrix.

"The XL-88 allows the house staff to route signal the way they want, but they can also bypass it and use the onboard matrix mixer in the Paragon," explains Janssen. "This configuration also allows running straight left/right stereo very easily."

The Grand Ole Opry House project (as well as the other two Nashville venues) marked one of the first uses of the UREI Platform Series digital signal processing system. A wide range of modules available in the Platform Series can be plugged into a master module, providing control of parameter settings and a large graphic display.

Twenty Platform Series DSP1 modules, each with two analog inputs and four analog outputs, were employed for maximum loudspeaker control. Outputs can be set to pass any range of frequencies (up to four total) for high design flexibility. The DSP1 also provides digital delay for both transducer and time alignment (with 20-microsecond resolution), 12 bands of fully assignable parametric equalization and preset capability with immediate recall.

The DSP1s were literally so new that the design team programmed them during the installation process—coding for the devices was sent via modem by UREI straight to the site. A master BSS Varicurve parametric equalizer and five Varicurve slave units provided additional equalization.

An added bonus to the project was the talent of Alexander Yuill Thornton ("Thorny"), best known as longtime designer for Luciano Pavarotti. With Janssen and Vance Breshears of Acoustic Dimensions, Thorny fine-tuned the system using a combination of TEF 20 and Meyer SIM analysis.

All three projects were completed in a fast-paced manner, with the majority of work done, by necessity, during off-hours. Janssen says time was often so tight that "we were actually ordering equipment as the system was being designed." He also credits Landiss' expertise, which he says brought an important "added bonus" to each project. "His technical expertise is quite phenomenal, far above the realm of most clients, which made the system even better." ■

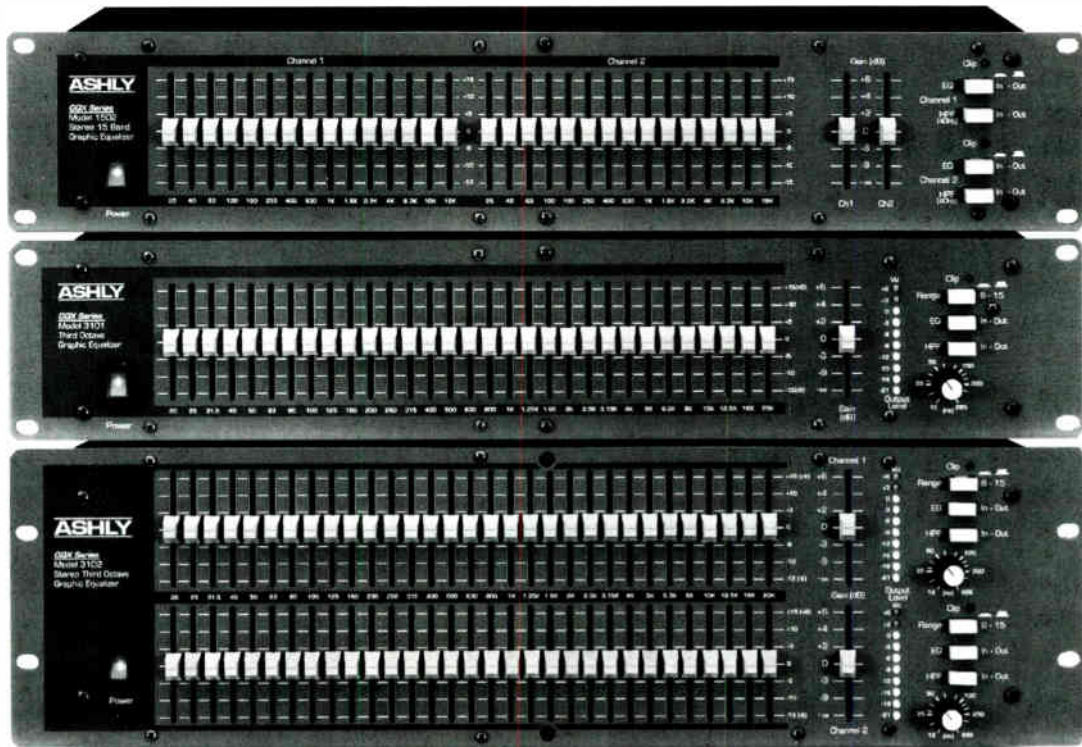
*Rod James is a freelance writer based in the Midwest.*



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# New Sound Reinforcement Products



## TELEX FMR-150 WIRELESS

Telex Communications (Minneapolis, MN) unveils the FMR-150, a frequency-agile, crystal-controlled wireless mic system. Employing three crystal-controlled RF oscillators with frequencies selected for maximum compatibility, the system virtually eliminates intermodulation distortion while allowing the user to select a clear channel in the event of outside interference. Frequencies can be selected from anywhere in the operating range of the receiver, enabling maximum compatibility in multisystem installations.

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## NADY EAR MONITOR SYSTEMS

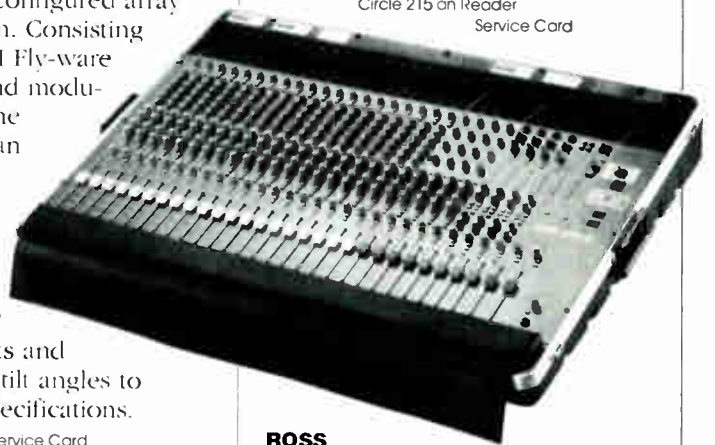
Nady Systems (Emeryville, CA) introduces two lines of wireless stereo ear monitor systems. The SEM-6000 is a professional VHF system, and the SEM-7000 is a professional UHF system. Both are single-rackspace systems designed for a minimum operating range of 250 feet. Each features two independent channels broadcasting in stereo or mono (the 7000 works on one of four switchable UHF frequencies), a front-panel, audio-input level adjust, transmit "TX" LED indicator, stereo mini-headphone output with volume control, a four-position, frequency-selector switch and a pair of three-color, 10-segment, LED, audio-level bar graphs for each channel.

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## ATM FLY-WARE AMGS SERIES

ATM Fly-ware (Carson, CA) offers the AMGS Series modular, loudspeaker-grid flying system, designed to address the task of permanently flying multiple-loudspeaker enclosures when a horizontally configured array is not an option. Consisting entirely of ATM Fly-ware components and modular in design, the AMGS Series can accommodate horizontal loudspeaker enclosure aiming angles from 0° to 180° in 5° increments and radical vertical tilt angles to meet cluster specifications.

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## ROSS SYSTEMS SR CONSOLE

Ross Systems (distributed by Intl. Music Corp. of Ft. Worth, TX) debuts the RCS2842 Sound Reinforcement Mixing Console. Featuring 20 balanced mono mic line inputs, four stereo line ins, eight stereo aux returns and a stereo tape in (for a total of 46 possible inputs), the RCS2842 has been designed to be user-friendly and rugged, with 4-band sweepable mid EQs, EQ-defeat switching, 12-segment, LED bar graph displays, etc. Retail starts at \$2,995.

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## XTA AUDIO DELAY PROCESSOR

The DP100 from XTA Electronics (Farmingdale, NY), a two-input, four-output, assignable, audio-delay processor for live sound reinforcement applications, provides a flexible solution to audio-delay requirements and system engineering. The DP100 has three-band parametric EQ, balanced analog and digital I/O,

a standard maximum delay of 2.73 seconds in Mono mode, 103dB dynamic range, and a dual-line, 20-character, backlit LCD readout. For critical driver alignments, delays can be set in 11-microsecond increments, and a temperature-correction function compensates for ambient temperature changes.

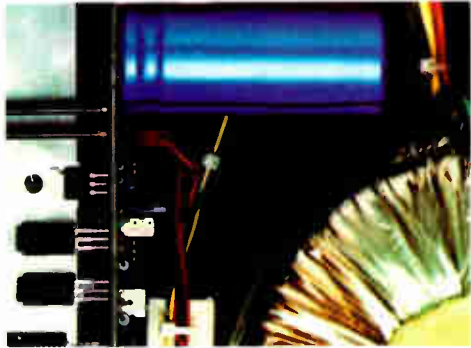
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Well, You Asked . . .  
Breaking In to  
"The Biz"

by Larry Blake

Since I started this column in January 1994, by far the largest percentage of cards, letters and e-mail has been from students wanting to know how to break in to "the biz." If they're not concerned with their future, they gen-

and you had better know what a resolved transfer is and what it isn't; you can't just press "play" anymore. Everyone who worked in film sound in the '70s and '80s has a handful of horror stories about how people in recording studios appear to think that sync is a place to wash dishes. ("Why can't you do playback from a cassette?") There are times when I believe that fast-cutting on music videos was born of a need to hide sloppy sync.

While this situation has

come from a handful of re-recording mixers at the studio. Not what I would call a very broad education.

I don't think that this path will be possible in the future. To work in film re-recording, you will have to have extensive knowledge of workstations, preferably having done much sound editing yourself. And the "squawk box" on the editing bench will no longer be the most complicated piece of electronics that sound editors



ILLUSTRATION: TIM GLEASON

erally ask for my recommendations on everything from workstations to what books to read and what recording schools to attend. Because the questions have been concentrated in such a relatively small number of areas, this month's column will try to touch on the basic issues facing students who are looking for careers in sound recording.

The biggest change in the past 15 years is that there no longer exists a career as "just a music recording engineer" or "just a film sound re-recording mixer." To succeed in music recording these days, you had better know your timecode backward and forward,

improved in recent years (with top-flight recording studios, especially, knowing what they're doing), there is still a ways to go. To be fair, the reverse holds true for some film studios with regard to timecode—they're still discovering problems that video post facilities met and solved a long time ago. And lest you think I'm holding film sound mixers to some exalted position, note that many a talented re-recording mixer began life in the machine room reading *Playboy*, graduating to being a mixer reading *RV* magazines, and whose only knowledge of film mixing (not to mention sound recording in general)

will be using. I don't want to hear any crap about how the two disciplines are covered in the U.S. by different unions; when last I checked, there was only one soundtrack.

The moral of all this is clear: Regardless of whether you want to focus on music recording, sound for radio and television, or film sound, you should try to soak up as much as you can about *all* disciplines. But where do you get this knowledge?

Stated another way, what good is a degree—either from a university or a recording school? In terms of getting hired in the film industry, not very much. I hate to be so

—CONTINUED ON PAGE 139



## Consoles For Post-Production USERS SPEAK OUT

by Gary Eskow

The automobile and the recording console have more in common than might be apparent. Both came of age in the '50s, and where functionality once reigned supreme on the road as well as in the studio, status—the kind that derives from how big, colorful and impressive-looking your product is—eventually came to play an important role in defining which pieces would survive in both markets.

Large post-production audio facilities are faced with an interesting dilemma these days. By and large, their clientele is sophisticated and knowledgeable with respect to digital audio workstations. And yet, a quo that follows the quid pro is often lost on them. That is to say, with DAWs handling more and more DSP and routing functions, the need for consoles with a zillion



PHOTO: JENNIFER GRADCO

*Tim Butler, audio engineer at Chicago Recording Co.*

knobs and a ton of foot-space has receded—in some cases, dramatically. However, studio owners are fearful that if they trim back the size of their consoles, and the “gee whiz” factor that a thousand dials brings—especially to their A rooms—clients will flee.

We contacted a handful of sound designers and audio post mixers across the country to get input on what kind of consoles they need to prepare audio-for-

video work these days, first in terms of the intrinsic requirement of the job itself. We then tried to square these responses with their perceptions of what kind of gear is necessary to assuage the jagged nerve ends of a pressured client who wants to feel that he or she is working in an environment where a special kind of magic is being spun.

“There is an absolute friction between what you

need and what your clients expect you to have!” says Tim Butler, a 15-year veteran of the Chicago Recording Company, a leading facility in the Windy City. Butler, commercial production engineer at CRC, was the second person in the country to own an AMS AudioFile. He currently works with a 16-channel AudioFile, a 12-channel Sonic Solutions, a Synclavier, Sound Tools and SampleCell 2. Why so many DAWs? “They all do different things well,” he says. “The AudioFile is the fastest editor of them all. The Sonic NoNoise is a great feature, which we use all the time, to declick mouth noise, for example. File compatibility is getting better all the time, and so it makes sense to have tools to handle different needs.”

Like many others, Butler's concerns about client perceptions has caused him to consider reversing the old “let form follow function” nostrum. “The AMS Logic 3 is a terrific console, but in its basic

—CONTINUED ON PAGE 139

*Ralph Kelsey, engineer at Broadway Sound, a new division of Broadway Video in Manhattan*



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blunt, but the only thing a supervising sound editor cares about when hiring an editor is whether or not they can use the equipment to cut creatively and on schedule. (And similarly, film studios apply similar logic when hiring the producer and director: Do they know what they're doing?)

I'm well aware that one could turn around and rattle off the list of film sound greats that have come from USC, among other universities. While I certainly can't speak for any of these people, my opinion is that they would have succeeded regardless of where they went to school.

I think that in the final tally, it's up to the individual. If you feel that you want a liberal arts education and would be best served by attending a university film school or music recording program, then go for it! A comprehensive recording school might be the best approach if you want to get a good foundation on recording basics before you put yourself on the market. Recording schools are logical places for studios to seek interns, helping you get that crucial foot in the door.

Just don't let anyone tell you that you will be able to trade your degree for a job. This is not a normal career, and the standard paths simply don't exist. (I have this bizarre image in my mind of re-recording mixers being "board certified.")

On the other hand, if sound is the first thing you think about when you wake up in the morning, and you spend the rest of the day eating, breathing and sleeping sound, then for *you* the best approach would probably be creating your own curriculum from the money that would otherwise have been spent at a university. Buy equipment, attend trade shows and seminars, sign up for manufacturer training courses, talk to people who know what they're doing, and read all of the books you can.

I'm often asked to recommend books on film sound, and I'm sorry to say that the pickings are very slim. Much useful material can be found in the *Mix Sound for Picture* anthology. I can also highly recommend Vincent LoBrutto's *Sound on Film: Interviews With Creators of Film Sound* (Praeger Publishers, Westport, Conn.).

Yours truly is currently working on three such tomes. First up will be



the autobiography of film sound great Murray Spivack (see my August 1994 column), which I'm in the final stages of editing. It should be in stores by this fall.

Next to be published will be the second edition of my now-out-of-print 1984 *Film Sound Today* anthology which will include, in addition to the original six articles, 15 other features and 45 columns that were published in *REP* and *Mix* since that time. Finally, I will be publishing my also-long-overdue handbook on synchronization techniques for film, audio and video. Because I will be at work on my next feature film before I can get these books to the printer, don't look for them any earlier than late next year. Keep posted to this column for updates.

Regardless of which specific discipline of sound recording you want to go into, you will be listening for a living, and you should get the best sound system that you can afford. Listening to great sound jobs is *an important* part of your education. If you are in the market for a new stereo, I recommend that you purchase a receiver equipped with Dolby Pro Logic, along with three matched speakers. Get as good of a front (LCR plus subwoofer) speaker system as you can possibly afford. I am not as obsessed with surrounds as many people, and indeed I just use four Radio Shack Minimus speakers. ("Mr. Blake accepts no compensation for this endorsement.") First, you need to do a bit of research to determine what speakers exist at the point in the curve where your tastes and wallet meet. Then try to listen to them, preferably *in situ* in your home. (This is a tricky thing to arrange with dealers, although there are a few brands sold via mail-order only that *expect* you to do this and offer a 30-day return guarantee to that end.)

Once you settle on a system, line it up by listening to a wide range of films done by different crews. Also, of course, use your favorite music selections. One of the key parts of "lining it up" is finding the best placement and crossover/level adjustment for your subwoofer. The goal is to create a seamless blend

with the low end of your main channels, eliminating that obnoxious thumping that is the hallmark of a badly aligned sub.

In the end, my advice is: Be persistent. I'm not about to try to turn a witty and wise phrase regarding the value of hard work. There are enough such quotes already floating around to inspire the next three generations of film sound geniuses. Just know that they're all true: work hard, don't give up and in the end you will make your own luck.

While I have tried to answer general concerns this month, don't hesitate to send your more specific questions directly to P.O. Box 24609, New Orleans, LA 70184, via fax (504) 488-5139, or via e-mail at [swelltone@aol.com](mailto:swelltone@aol.com). Please note that I will *rarely* recommend any specific pieces of equipment; for example, if you're looking for an inexpensive workstation to go with your PC, then trade shows, magazines and other users are your best bet. However, if you want to know what films you should listen to in your home theater, tune in to next month's column. ■

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*Larry Blake is a sound editor and re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be the quality of the blackened rubber chickens that are served before AES local section meetings.*

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—FROM PAGE 137, CONSOLES FOR POST configuration, it only has four faders. In reality, that might be all that I need. However, if I was going to buy a Logic 3, I'd definitely take the extra 12 faders that you can purchase, simply because I don't think our clients would feel comfortable working with a console that had just the four."

Butler currently works on a Harrison Series 10B console that he raves about. "You couldn't pry it away from me," he says. However, he realizes that consoles having an analog path are just a way station on the road to all-digital. "We're going toward a melding together of the DAW and console—one day there

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will be no separation between the two. Console manufacturers not making editors will be in trouble, and vice versa."

Anyone who cuts picture in the Big Apple knows Broadway Video. As of February '95, the one-stop shopping concept has been brought into this venerated post house, with the opening of Broadway Sound. Ralph Kelsey and Michael Unger are the department heads of the new audio post division of BV.

"The role played by the console is becoming less of an issue," says Unger. "It used to be the centerpiece of the room, and that continues to be its image in the mind of many clients. Here at Broadway Sound, we own several Sonic Solutions workstations, and everyone knows that most of the signal processing you need for television work can be handled within these boxes.

"We have a Mackie 24x8 console in our small room, which is primarily a voice-over room with a smaller (8-channel) Sonic Solutions. We do lock to picture here, as well as in our larger rooms. Honestly speaking, our console requirement here is merely that the signal path be clean; the console is mainly a signal router. For our bigger rooms, both of which have 12-channel Sonics in them, we bought Soundcraft DC2000 boards—which we consider to be a straight-ahead, down-and-dirty, automated console. These kinds of consoles are interim only—Sonic, or some third party, will develop a digital board that we'll want to buy. Knowing this makes it hard to invest in a \$100,000 boat anchor. We're on the cusp of major change."

Both Butler and Kelsey agree that larger consoles become necessary as you move up to the larger projects that use inputs from a variety of sources. The growing acceptance of stereo imaging in broadcast has doubled the number of faders required for many projects.

Chris Argento has been mixing sound at New York City's Videomix since 1989. "I cut mostly long-format stuff, for National Geographic, the NCAA basketball highlight films, and so on," he says. "I still use the console quite a bit. However, for spot work, the importance of the console has diminished—you don't have the number of stems, or the need for a variety of discrete mixes, that you run into with the longer pieces. The



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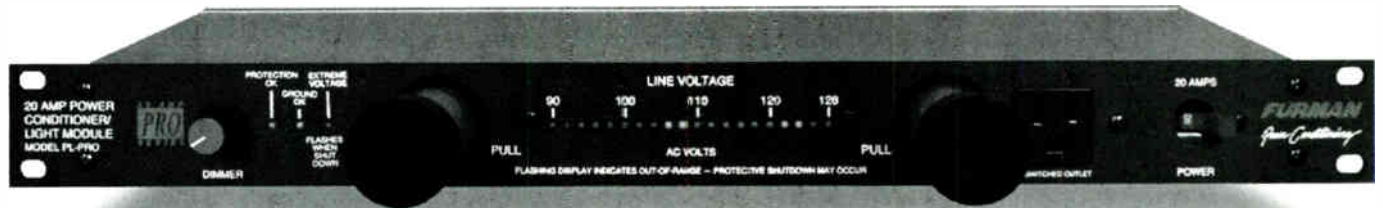
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visual aspect is still important to the client—he or she doesn't want to feel that spot work is of secondary importance. If they're paying top dollar, they want to see an engineer roll his chair from one end of the room to another to grab a fader!

"If I'm doing unsupervised sound editing, I'll sit there with a computer and my TAC Bullet board, which is a 12x4x2 console that's about a foot and a half wide—it's absolutely fine for me," he continues. "We have a larger desk in our A room, a Sony MX-3000, which is relatively simplistic. It's not a huge SSL with tons of DSP built in, but it's very clean and it looks relatively impressive. It has a quiet, clean routing path, and that's all that we're looking for."

John Anderson, a re-recording mixer at Sound Trax in Burbank, Calif., says that mixing for television means everything is speeded up. "We get five days to mix for TV what a feature mixer might have five weeks to complete. The best consoles for TV work are simple, with the least amount of traps built into them. For example, a fader that is assignable to multiple areas has great flexibility, but if you're working very fast, you can get lost in its routing. SSL makes wonderful consoles, but there's too much fine-tuning in them for our needs.

"We use an Aries 24x8x16 console, made by Gotham Electronics in London. We have three linked together for film and TV mixing, and they've been modified to our specs."

As far as television audio post work goes, our panel of experts agrees that console purchases are driven by client expectations as well as functionality. But is it only the ego needs of the client base that is being considered here? Let's give the last word to Butler. "I'll be putting a Yamaha ProMix 01 in my room," he says. "I have a wonderful assistant. He can be executing prelays through headphones while I work. Could I see myself cutting on the ProMix? Honestly, I don't think so. Part of your console is your badge. If you're a successful engineer, you want a console that matches what you think your status is! A little bit of ego is wrapped up in it. Even for us, the psychological aspect is as important as the practical." ■

*Gary Eskow is a New Jersey-based musician and writer.*

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**T**his article is a behind-the-scenes look at an often-overlooked aspect of film sound: the connection between the production and post-production teams. The film being made is *The Underneath*, the fourth collaboration between director Steven Soderbergh, production sound mixer Paul Ledford, and supervising sound editor/re-recording mixer/post-production supervisor Larry Blake. (The other three films were *sex, lies, and videotape*, *Kafka* and *King of the Hill*.) The new film is a remake of the 1948 thriller *Criss Cross*, taking a twisted slant on the “you can’t go home again” maxim. Peter Gallagher plays Michael Chambers, who returns home to present-day Austin to find his former wife (Alison Elliott) going out with the hood who runs *The Ember*, the nightclub where they used to hang out. Wheels are put in motion for the inevitable “your reach exceeds your grasp” moral when Michael puts himself (and his mother’s new husband) in the middle of a staged armored car robbery.

In keeping with the inevitable doom of film noir movies, scattered through this article are sections in italics to indicate post-production hindsight, when pre-production and production assumptions come due like payments to a loan shark.

#### SUNDAY, DECEMBER 12, 1993

Met with Georgia [Kacandes, the unit production manager, who is responsible for budgeting] in Los Angeles to go over the initial budget. The film has a “flashing green light,” which translates from Hollywoodese to “almost a sure thing.” Shooting would start early March in Austin, for seven weeks. For budgeting purposes, we have assumed a 20-week post schedule, which would put the answer print sometime around Labor Day. Post-production will be in New York, something Steven and I have been looking forward to doing for a long time.

*The Underneath ended up as the most on-schedule movie we’ve done yet, with the mix ending on September 10.*

#### THURSDAY, JANUARY 27, 1994

Paul is putting together his sound crew, and it looks like Robert Maxfield will be the boom operator. Handling second boom, among other duties, will be David Jensen, a longtime filmmaking colleague of ours. I think boom operating is the most misunderstood and underappreciated job in all of film sound.

Two of our films have had minimal (less than ten lines) looping, most of which was plot-point stuff or material like soft breaths that can be hard to do on noisy sets. (*Kafka* had more looping only because we had a large number of actors for whom English was a second language.) Which reality is more real today: dollars or quality? During pre-production it’s dollars and cents; in post-production, you see how the money spent on the quality of the production track saved those same dollars and cents.

*Max’s work on the boom was indeed great.*

Paul will be recording on a Nagra at 15 ips with Dolby SR noise reduction, as he had done on *Kafka* and *King of the Hill*. We know that one day he’ll probably join the ranks of production timecode DAT users, but we’re real pleased with the sound of SR-encoded ½-inch. We talk of one day making extensive tests with an SR Nagra setup and a timecode DAT, then doing a controlled listening bakeoff. This experiment will have to wait for another film because of the short prep schedule and low budget.

Mailed Paul the Mark III version of our custom production sound logs, which we make for every film. There was very little difference between I (*Kafka*) and II (*King of the Hill*), but this one will have some major improvements: 8.5x11 instead of half-page; each-take distinction between A and B cameras (when Steven might want to print one but not the other on certain takes, and both cameras on others, without requiring a whole affidavit from Paul), and a line at the top of each page for “Location.” Stupid as it may seem, the location (with regards to the script) always seems to come up when thumbing through the sound logs looking for something.

# “THE UNDERNEATH” EXPERIENCE

## TYING TOGETHER PRODUCTION AND POST

BY LARRY BLAKE



**Rachel  
(Alison Elliott)  
and Michael  
(Peter  
Gallagher)  
in Steven  
Soderbergh's  
film, *The  
Underneath*.**

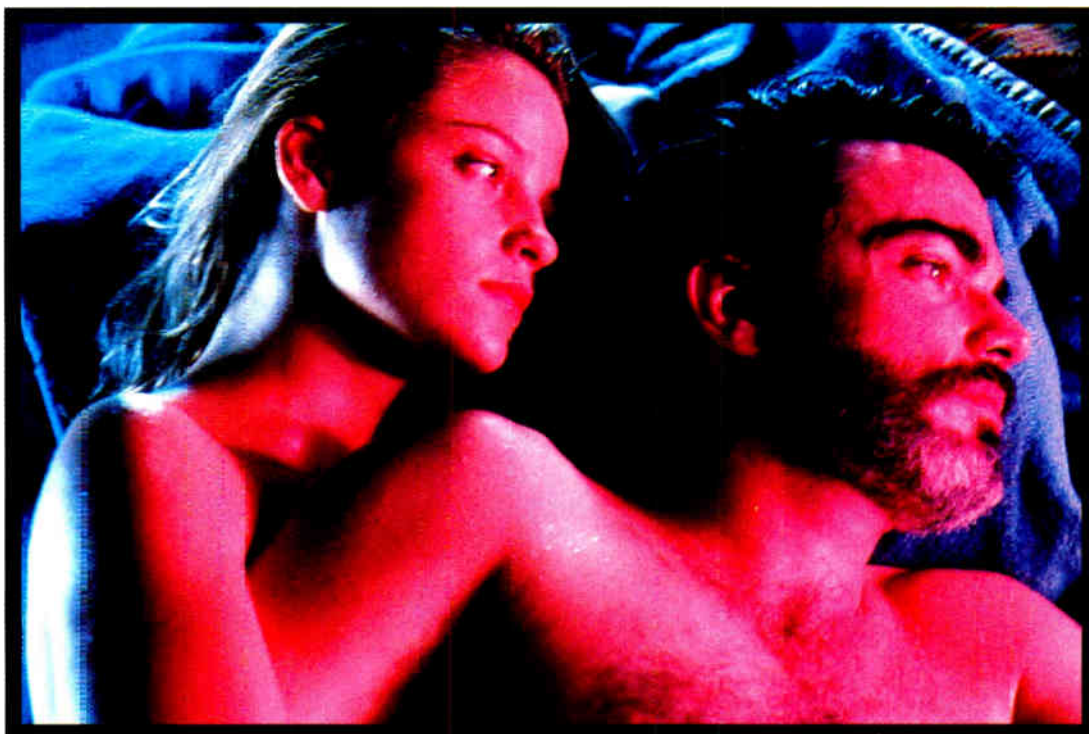


PHOTO: ALAN PAPPE/GRAMER; Y PICTURES

Paul said he wanted to test a Schoeps BLM-030 for the running shots inside the armored car, instead of using two standard capsules. I'll be curious to see what he finally chooses; on *King of the Hill* he used the "subcardioid" MK21 Schoeps capsules inside cars, and they sounded great.

*He ended up sticking with MK21s and sometimes also used a Sennheiser MKE-2 lavalier because the wooden armored car mock-up was so noisy.*

#### **SUNDAY, FEBRUARY 6**

News flash this week: There will be bands playing in the scenes set in the Ember nightclub. Steven and I talked about the music situation: four bands, four separate scenes, two or three songs per band. Bands: Gal's Panic and Herman the German, both from Austin, and Cowboy Mouth (which has three guys from the Backbeats, for which Steven did a video back in '83) from New Orleans. Plus one other band to be named later.

*The fourth band was Wheel, whose drummer, Aaron Glascock, had worked with us on all three previous films.*

Steven wants to shoot the music scenes to playback, and I discussed with him Paul's idea of recording the bands *in situ* during a nonshoot day. He liked that idea because he wants to be there during the recordings. Since the current shooting schedule has the Ember scenes being shot starting on Monday, April 11, I thought we could do the recording on the previous Saturday and Sunday. His big request is that it sound and feel like a live recording. Since we both hate dry playback sound as much as we hate dry ADR, it's a challenge I look forward to.

#### **MONDAY, FEBRUARY 7**

Paul called this morning to talk about the music recording. I proposed that we record a "playback

master" on his backup Nagra, which would also function as the master clock. We would then jam a De-necke sync box to it and use that to feed timecode to track 24 of the multitracks. I'm thinking about pulling a separate MDM (ADAT or DA-88) to record offstage mics.

Back to the Nagra tape. It would be a good idea to record vocal only on one track and minus-vocal band on the other, allowing Steven to shoot closeups of the singers with five vocals, if necessary. These vocals would only be recorded on Paul's SR Nagra because the cost of keeping the truck around during shooting would be prohibitive, although it *would* be nice to be able to record multitrack crowd effects.

We discussed filming the playback scenes with two timecode slates, one indicating normal time-of-day code on the Nagra, and the second showing playback timecode.

*Steven eventually said that he wouldn't need to record live vocals to band-only playback tracks. Redoing the vocal would have rendered unusable the room mics (from the original prerecords). With regard to the slates, when the shot was set and the three cameras and bands were in place, the wisdom of a single timecode slate became apparent.*

#### **MONDAY, FEBRUARY 21**

Pre-production on *The Underneath* will end in a week, but post-production on our films—at least with regard to my never-ending quest for Quality Control—is not just a job but a lifelong adventure. Case in point: I saw *sex, lies* on WGN, and the noise was absolutely astonishing: pumping and sucking, rising to horrifying levels during quiet moments. Not only could I tell that this was not the minus-curse-word version that Steven and I made in 1990, but the internal edits and the commercial breaks seem to have been timed with the greatest dramatic damage in



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mind. This makes me more resolute (if that is possible) to try to make our approved telecine transfer the only one seen. I tried calling WGN during the broadcast but never reached a human being.

## TUESDAY, FEBRUARY 22

In Austin for on-location pre-production. A lot of what I do in the week preceding the first day of shooting has nothing to do with the sound *per se*, but instead revolves around coordinating the picture department with camera and production sound. And also doing the post budget. On previous films, Steven has been his own picture editor, with editing proper beginning after shooting wrap. This has also allowed us to generally wait until shooting ended before transferring the film dailies to tape. Things will be a lot different this time.

First, we have two new members on the post team: Stan Salfas, who will be the picture editor, and Susan Littenberg, who will be the first assistant editor. (We had a real tough time finding a N.Y.-based assistant who knew Avids and who could also handle film.) Stan will be cutting on location. Also, this will be our first film on the Avid Film Composer, after two on the now-obsolete laserdisc-based EditDroid system, so we'll have to start from scratch in testing the sync chain from shooting to dailies telecine to video editing to film conform to sound edit. A week before principal photography begins, we always shoot a continuous 10-minute sync test, with timecode slate visible and occasional clap sticks (plus continuous talking from the crew member holding said slate). We then use this known reference to check the chain. It's so simple to do and always appears *obvious*, yet all I hear from people is the problems they have with cutting films on video. I just don't get it.

*The testing continued when I got to New York, with assistant sound editor Chris Fielder checking the 1/4-inch/Avid/Sonic Solutions/DA-88 sync chain every way from Sunday.*

We've arrived at a sound flow chart. Paul's 1/4-inch SR production sound tapes will be transferred to standard non-Dolby 35mm mag stripe and manually synched the old-fashioned way, with one exception. The 30 fps nondrop center-track timecode will be copied across to

**Production  
sound mixer  
Paul Ledford on  
location in  
Austin with  
his Nagra  
(Dolby SR)  
and Cooper  
CSS-106 mixer.**



PHOTO DAVID JENSEN

the mag's balance stripe, using track 3 of a three-track head stack. From that point on, the mag will only be used twice: during film-to-tape transfer (when the timecode on the balance stripe will be read and entered into the Evertz Keylog database) and during dailies projection.

During editing, the nominal "worktrack" will be taken from the Avid, and instead of having to conform 35mm picture and track with each new version, Susan will only deal with the work picture. We will be using Beta SP at telecine, not for its improved picture quality but because of the hi-fi tracks. Normal Beta or 1/2-inch linear tracks would have been the weakest link in the chain and would have compromised the quality of the preview temp dubs. Of course, we will eventually replace everything from the original 1/2-inch tapes during dialog editing.

*The Avid track worked out fine for our temp dubs, especially since Stan took such care in the sound portion of his cutting. Most everything was on his A track, with necessary overlaps on the B track and all music on the C track. For the first two temps, we copied the Avid worktrack to my Sony TC-D10 Pro DAT machine and then loaded them back into the Sonics for minor editing before cloning it all off to DA-88s for the mix. I was chagrined to find out that, due to a minuscule sample rate difference between my TC-D10 and the Sony PCM-7030 used during DAT-to-Sonic transfer, the sound was about three perfs [i.e., 1/4 of a film frame] late by the end of a 20-minute reel. This really pissed me off, and for the final Avid worktrack transfers, we went directly into the Sonic from the Avid. Presto, perf-accurate tail pops. Accept no substitutes.*

*Next film we hope to eliminate mag altogether by shooting with timecode in the camera. During dailies projection, the Avid down the hall will lock to code that's read off the positive workprint, sending the sound back to the screening room. The track would have been loaded into the Avid from timecoded DAT or 1/2-inch. This sounds a bit farfetched but is the only procedure I've come across that allows projected film dailies while sidestepping the use of mag. After more than 10 years of talk about timecode on film, it seems as if it will finally happen in a way that truly makes "prior art" obsolete. So many proposed uses seem to make high-tech and complicated what was once manual and easy. I know Avid is working on this, and I hope they can pull it off.*

Also this week was the final budget meeting with the production and accounting folks from Universal. Since John [Hardy, the producer], Georgia and Steven were able to bring *King of the Hill* in on time and budget, I'm sure this will be a formality. I'm quite confident that my post budget treads that thin line between being seen early on as greedy and being seen in post as unable to predict eleventh-hour surprises.

The X-factor for me is really post-production in New York: I will have a new sound crew at a new sound editing company (C5, although I've been buddies with one of its principals, Skip Lievsay, for many years), with a new sound editing system (Sonic Solutions, which is the standard in New York), and a new mixing stage (Sound One or Todd-AO). Confident though I may be, I'm still wondering what I'm overlooking. I snuck in a few items the day before the budget meeting, eliciting gutter-

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al growls from Georgia.

At the very least, Universal won't challenge the Swelltone licensing fee, having experienced the advantages of Swelltone encrusting on *King of the Hill*.

*Everything worked out great in New York: The crew at C5 were a joy to work with. We ended up mixing at Sound One's newly remodeled Studio C and had a jolly time.*

#### TUESDAY, MARCH 1

Production meeting with Paul, Steven, John, Georgia, Greg Jacobs (first assistant director) and Howard Cummings (production designer) on the music recording for the Ember nightclub scenes. This is a dream production crew for me (and I'm sure I can speak for Paul, too). I brought up the idea of recording the music on Saturday and Sunday, April 9-10, and inviting the cast and crew to attend the Saturday-night session, turning it into a party. We would then be able to record crucial bar BGs in 5-channel stereo. The only catch would be that during the recording of the songs proper, everyone would have to keep quiet. Greg vetoed this idea, saying that he has a tough enough time keeping everyone quiet on the set during shooting. He may have a point there. Howard showed me a scale drawing of the Ember set, which will be built in an old electronics parts warehouse.

Didn't get a chance to say goodbye to Paul before I left, so I called during my stopover in Dallas to wish him good luck when shooting begins tomorrow.

#### MARCH

At home in New Orleans, I've been figuring out the specifics of the Ember music recording, such as getting bids from remote trucks and nailing down the recording schedule. Sunday, April 10, and Monday, April 11, look firm. We will probably be using the Reelsound Recording Company remote truck based right there in Austin.

I have been pushing for my friend Leanne Ungar to engineer the prerecordings and have met with some resistance from the production end, for no other reason than the \$\$ to fly her in and put her up in Austin. "Austin is a big live music town, there must be some good engineers here." To which I would

reply that I'm sure there are, but I don't know them and can't sign off on them. When I told this to Leanne, she honorably put in a good word for a guy who does the *Austin City Limits* TV show.

It finally boiled down to my asking John to humor me on this one. Beyond her considerable skills as a recording engineer, Leanne's calm demeanor will be an invaluable asset.

Saw Cowboy Mouth perform at Tipitina's [in New Orleans], and they look like they will come off well on film.

#### SUNDAY, MARCH 20

Paul called tonight; the reason we hadn't talked in two weeks was simply the old "no news is good news" axiom. He thought things were going pretty well and said that as of Saturday, he hadn't used any radio mics! Sixteen days of shooting. I immediately thought of Joe DiMaggio's 56-game hitting streak. I was both very impressed and very pleased.

*Paul kept the non-wireless streak going another eight days, and in the final tally he only used them for about five scenes. His radio mic recordings are as good as most mixers' boomed tracks.*

I asked Paul about some camera noise I had heard in a scene (the picture department has been sending me a VHS copy of their Beta SP telecine tapes). He said that it wasn't camera noise, as I had thought—it was the sonar focusing device on the Panaflex camera! Also the high-frequency whine that I thought was HMI ballast noise was instead from the lamp head itself; Paul said that the electrical crew was exemplary in using long cables between the heads and the ballasts. I don't think the whine will be a problem to notch out during the mix.

*And it wasn't, having been located at around 6.5 kHz. Steven made a decision to deep-six the Panafocus device because he (correctly) assumed that it would have been impossible to filter out.*

After a rocky start wrestling with some Avid problems, Stan and Susan seem to be in cruise mode. Any day now they will be getting some brand spanking new 9-gig drives. We figure that considering Steven's usual economical shooting ratio, we'll be able to fit the whole film on four drives, even though the picture is being digitized at the relatively high



quality of AVR 5E. Sound is going in at the 48kHz sampling rate, not because I was concerned about the difference between "CD Quality" 44.1 kHz and "DAT Quality" 48 kHz, but because I wanted to simplify digital Avid-to-DAT transfers, should that ever become an issue.

*The 70,000 feet of printed film did fit on 36 gigs. We never did go digital out of the Avid, though.*

**FRIDAY, APRIL 1**

I'm in Austin for the next three weeks, half to see to it that the music recording goes smoothly, and half to check off as many items from my effects recording list as possible.

**SUNDAY, APRIL 3**

Susan and I spent a few hours today cutting and recutting our sync test film, all the while checking the Avid film conform printouts for accuracy. Even though we have two-and-a-half weeks of shooting left in Austin, the initial work picture conform will commence in New York in a month. If there will be problems, I want to know *now*.

*And there were none.*

**SATURDAY, APRIL 9**

Checked in at the Ember to see how everything was going. Howard saw to it that we were able to hang curtains along the walls to deaden the room during the recording sessions. The parallel brick walls would have made for a weird room mic sound.

Went to the set as they were shooting the last of the running shots involving the armored car. Paul has broken down his rig to fit into the front seat of the camera car. Am surprised to see that he was able to include the SR setup, which is quite involved.

Saw the dailies from scene 46, whose location in the script sounds tame enough: "EXT. PARK—DUSK." Something funny happened on the way from script to screen, because they ended up choosing a very dramatic-looking and unbelievably noisy location at a lake underneath I-35.

After dailies, I asked Alison what her schedule was like the next few months. She will immediately start a mini-series right after we wrap and will go to England for it in the middle of May, staying there until late August. Yipes! The old CYA instinct kicked in: loop the scene, as soon as we get the first cut, in case Alison's

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not available and we need the loops for preview temp dubs. The Sound Effects Guy inside of me thought that this would be okay: We could layer neat effects to taste with the looped dialog, instead of worrying about crowding an already noisy production track.

Yet at the same time, the Dialog Guy inside of me whispered that this track actually sounds pretty good. Paul got the lavs as close as possible, and as a result Peter and Alison still have weight to their voices. It would be a different ballgame had the placement of the mics not been as good or had Paul stripped the low end out of the voice in a futile, ephemeral gesture to be a hero in dailies. "Fat and flat" on production is our motto.

*We did loop the scene (at Sound One in New York on May 13), along with other scattered lines of Peter's. Which did we end up using? Let me paraphrase a quote from The Man Who Shot Liberty Valance: when in doubt, print the legend. In the case of production vs. loops: print the production. The performances were there, and with careful dialog editing and EQ, I think the drama is on the screen.*

*The final tally of looped lines was ridiculously small, and with one exception, they were all to create a real phone futz: Lisa Shue [who plays Susan] changed her outgoing answering machine message to be from Susan Crenshaw, and I called her phone in L.A. to record it. Alison called from England, and I recorded a simple "It's me" for her phone call to Peter in the armored car company waiting room. And last but not least, during the final mix at Sound One, Steven redid his phone cameos as the guy who has the "inside inside" betting scoop and as the bookie who takes the fateful \$30,000 bet on an LSU game. He took the opportunity to somewhat change his voice as the bookie, since they don't usually offer tips.*

*The only other looping was Peter's breathing for the first part of the hospital scene. We put that (along with his sync dialog) into the surrounds to lift him off of the screen.*

## TUESDAY, APRIL 12

Post-recording session notes: Everything went as planned, two groups a day. Leanne got a sound real fast for each group, and the tracks sound great. She said she'd love to mix



PHOTO ALAN PAPPE/EGRAMCY PICTURES

these tracks with me in post, but I told her that I was much too selfish to share that fun with anyone else. Malcolm Harper and the guys from the Reelsound truck were fun to work with.

We had to tweak our pre-roll procedures: Initially, we asked the bands to hang tight for 30 seconds while we wound up the recording machinery: two SR-encoded multitracks, the Nagra, two cassettes, and two DATs, plus the ADAT recording the offstage mics. The long pre-roll is needed primarily for playback purposes. It was really unnatural for them to have to sit there in silence waiting for us, so we eventually started anticipating the roll by quieting things down in stages. Thus the groups spent less than ten seconds cooling their heels before the downbeat. For Gal's Panic and Cowboy Mouth, we did a couple of songs back-to-back, with tapes still rolling.

All of which made Greg even more right: There was no way that recording the bands with a partying crew present would have worked.

*Other lessons learned: should have remembered to have the musicians give each song a count-in, especially when one begins with a vocal. All the groups were pretty good in their lip-synching, although you really need to keep an eye on how they work the mic—if it's pointed away from their mouth, it feels as fake as American Bandstand. Stan's picture editing really saved us at times.*

## APRIL 14

Cut together the "print" takes for each group into a reel, and then transferred the whole lot of them to a DAT so that I would have an easy one-stop backup for playback in case the Nagra went down. (Sync would be fine, although we wouldn't have code.)

While I was on the set doing playback, I had my DAT handy to record walla of the kids who had been recruited as extras. At some point, I will try to get 4-channel

crowd stuff, with "interlocked" timecode Nagras.

*I should have rented a separate Nagra for the music recording and playback, if for no other reasons than bothering Paul less and being able to switch over from playback mode to 4-channel recording mode easier.*

## APRIL 16-20

Have spent much more time on the Ember stuff than I expected, and thus will have to cram in a lot of effects recording in a couple of days. My least successful expedition was Sunday night, when I left the (final) weekly cast-and-crew softball game to go to the state park in Bastrop, where the Whispering Pines exteriors were shot. Totally useless stuff: in the middle of nowhere, scared out of my mind, armed with nothing but a pair of fur-covered microphones. I was ten miles from the nearest highway, which sounded ten yards away because I was down-wind. Instead of lush crickets, all I could hear was my panicked breathing and radiator clicks (which were supplemented in my mind by the theme from *Deliverance*). A lesson in what not to do. Hope C5 has some good crickets.

Much more successful was my armored car series, and BGs at a hospital and a bank. Also did a complete set for everything—BGs, phones, doorbells, footsteps—that I would need for Michael's house, all recorded in a few hours at the real house on Brackenridge Street.

But it's back home for two days to finish packing, then it's off to New York to start work. When you work in post-production, even production feels like pre-production.

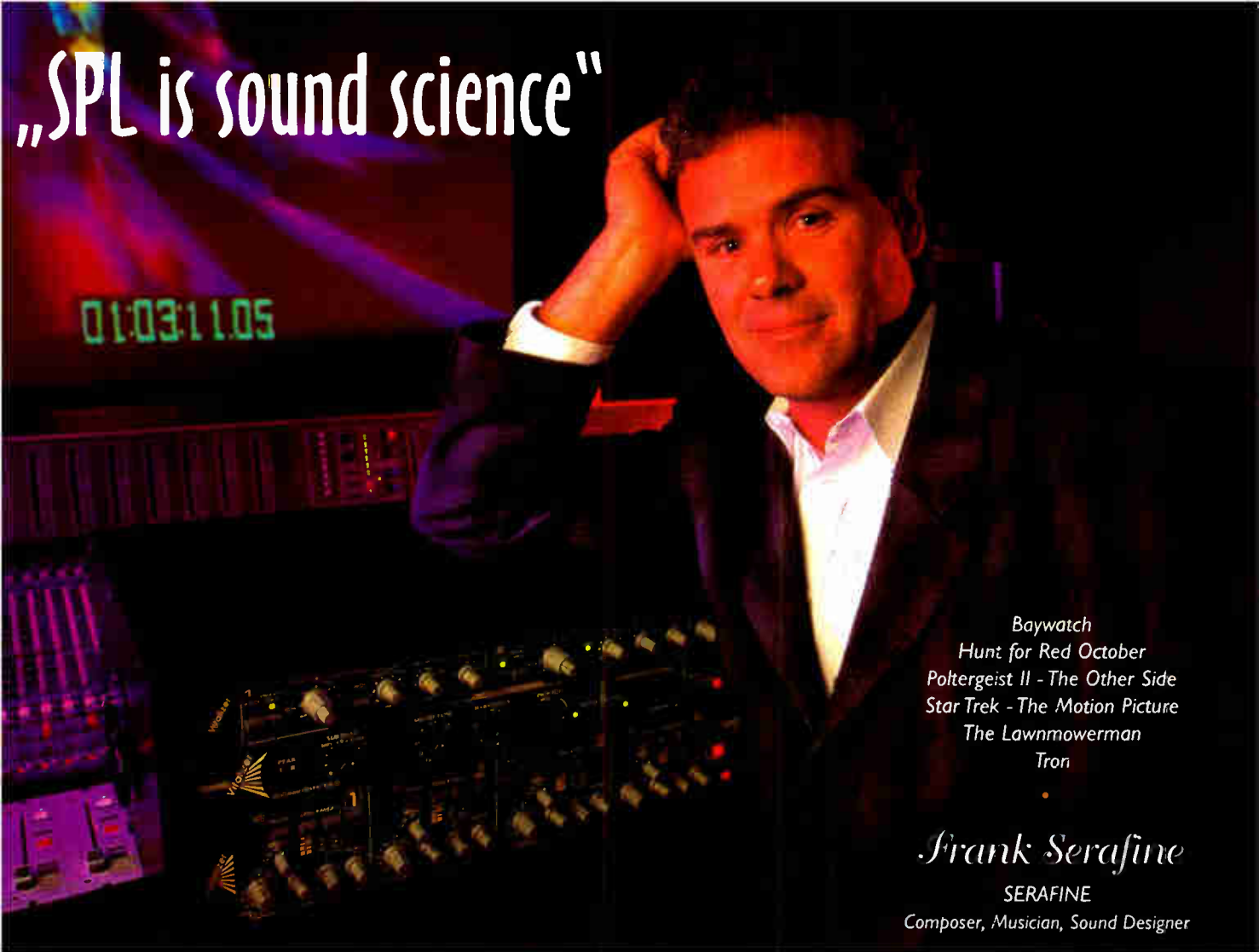
*The chronology of post was as follows: wrap shooting on April 22, screen first cut with mono temp on May 18, first public preview in Boston with stereo temp on June 6, second public preview in Philadelphia on June 30, lock picture on July 10, start dub August 8.*

*And the post post-production would continue after we left New York in mid-September: Video mastering took place in October; remaining mixing for the soundtrack album in December; and finally mixing the non-course-uxord "domestic airline version" for Universal in January of this year. April 26-28, tuned theaters in New York and L.A. for the opening.*

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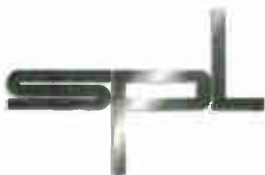
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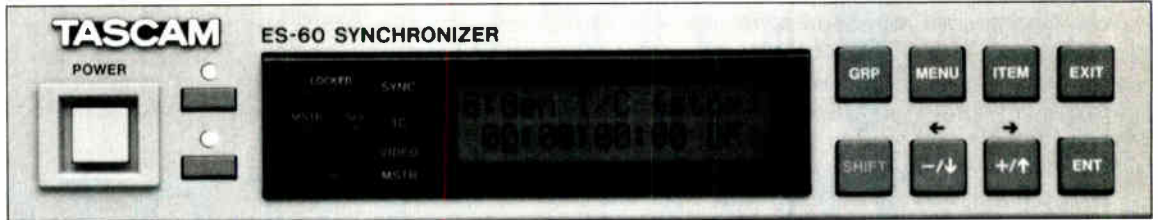


# NEW PRODUCTS FOR FILM/VIDEO SOUND

## TASCAM INTERFACE AND SYNCHRONIZER

Tascam (Montebello, CA) announces the ES-60, a powerful new interface and synchronizer designed for extremely simple operation. A half-rack unit, the ES-60 simplifies the process of controlling VTRs, audio tape recorders and other devices capable of locking to external references. The unit is pre-programmed with information about a wide variety of audio and video transports, as well as other external devices. This enables the user to select the machine or model number from the menu for plug-and-go synchronization. Unlisted machines are available by punching in the transport parameters and storing them in permanent memory.

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## AUDIO-TECHNICA SHOTGUN MICS

Audio-Technica (Stow, Ohio) recently introduced new versions of its Special Purpose Series shotgun microphones. The AT815b and AT835b now accommodate any external 9V to 52V DC phantom power source, or can operate independently on a 1.5V AA battery when remote power is not available. A premium AA battery will deliver over 1,000 hours of service. Each mic has a rugged housing with low-reflectance matte finish and comes with a foam windscreen and mic stand adapter.

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## HORITA BG-50 BLACK GENERATOR

New from Horita (Mission Viejo, CA) is the BG-50 genlocked multiple-output black generator. The unit provides multiple outputs of blackburst and composite sync for genlocking larger video or digital audio systems. All outputs are derived from the composite video input signal, which can be from any source including "off tape." Black level can be set to 7.5 or 0 IRE. Looping video input with terminator on/off switch. The desktop unit has six blackburst outputs. The rackmount unit has eight. Retail is \$219.

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## TWECOMM SDU4 REMOTE CONTROL

Twecomm (Pittsburgh, PA) has introduced two models of remote control for the SDU4 Surround Decoder. Enabling the user to put the monitor mode selection and master level fader anywhere within the calibrated listening field, the remotes use standard telco-style, detachable RJ-45, 8 conductor cable for connection to the SDU4 decoder. The TC-1443-A is an enclosed, stand-alone configuration that can be placed on any horizontal surface. The TC-1443-B is designed for custom mounting into a black console module or other operating surface.

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## GEFEN SYSTEMS SFX LOCATOR SOFTWARE

Gefen Systems (Woodland Hills, CA) has introduced M&E Pro, a new database software that searches, locates and organizes CD libraries of sound effects. Written for Macintosh computers, the software takes advantage of new systems and development software that include features like networking between computers and Apple events support built-in. The software is PowerPC-compatible.

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## 20TH CENTURY FOX SOUND EFFECTS LIBRARY

Distributed by Sound Ideas (Richmond Hill, Ontario) is the 20th Century Fox Sound Effects Library, a digitally remastered set of 1,350 effects on 10 CDs. Effects include vintage cars, animals, aircraft, crowds, trains, modern and ancient battle sounds, crashes, guns, weather, the original Batmobile and more.

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being timed at an assignment routing switcher so that the physically closest unit is delayed to the same time as the most physically distant. Fig. 2 shows a greatly simplified facility where it is assumed that Studio B is the physically most distant point from the routing/assignment switcher. Reference signals fed to this area could be fed direct from the distribution amplifiers at the SPG. The wise installer will incorporate a delay in this feed, as Murphy's Law dictates that something will be added farther away, especially when you don't expect it.

Each physically closer area—in this case Studio A, followed by the

VTR and telecine areas, and then the edit rooms—is fed with increasing delays such that the video from each will be time-coincident at the switcher. This arrangement can be totally reversed by making the references at each area time-coincident and adjusting delays in the video feeds. The results are identical.

The situation is often a great deal more complex because of multiple-source feeding, and, of course, each area—such as one of studios—must also be completely timed within itself. The delays used must be extremely accurate; by far, the best material is coaxial cable. The cable

needs to be cut (and properly connected!) within fractions of an inch. In complex facilities, this can amount to incredibly large amounts of cable. Building design can greatly reduce these demands, with the best arrangements usually being circular.

A modern-day alternative to these problems is having frame stores available at feed points into the assignment switcher; this can be a cost-effective solution for particularly long runs. For remote feeds, it is the only practical solution. But remember: Frame store = video delay = lip-sync problems.

The final timing adjustments are performed using the equipment's coarse and fine controls on the external lock point described earlier. Both a waveform monitor and vectorscope are required for the adjustments. First, the reference video is overlaid on the waveform monitor with the video being adjusted. Magnified out, the trailing edges of sync are brought into alignment with the coarse control. Some allowances may be needed for variances in edge shapes, and in such cases, focus should be on the coincidence of the midpoints of the edges. Next, on the vectorscope, the fine control can bring the bursts of the two signals into coincidence. With these two adjustments completed, the signals are now time- and phase-coincident. With one small hiccup...

The timing adjustment by delays ensures that the video signals are frame- and line-coincident, as well as subcarrier-phase-coincident. The adjustments do not, however, cover one other necessity, which is that all video sources have a subcarrier phase-to-line sync edge that is identical. This parameter, variously labeled SC-H, sc-h or SC/H, was not specified in the original NTSC documents. Its importance was only noted with the proliferation of color editing on VTRs. If two dissimilar, SC/H-phased video sources are edited together, the result is an annoying horizontal line jump of up to one subcarrier cycle.

The definition of what constitutes zero SC/H was quite arbitrarily made in committee, and it has stuck. Unfortunately, the defined line is one on which there is no burst. This means that measuring systems have to extrapolate from that line. Early systems were prone to unreliability, but recently, a number of the better

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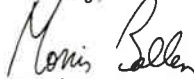
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vectorscope manufacturers have incorporated displays that are both accurate and reliable. When the SC/H is not zero, but either side of zero, there is no definition of what is positive and what is negative; zero is what you want. In practical terms, NTSC sources should be within 20 degrees of zero to avoid problems, and preferably within 10 degrees.

A facility with the same SC/H throughout will see no problems with its own material. If, however, that common SC/H is not zero, there could be problems in the event that there are tape exchanges with another facility. The main culprit for incorrect SC/H is the SPG, but strange things can happen in faulty distribution amplifiers and processing equipment.

On the theme of timing matters, a couple of months ago, *Mix* editor George Petersen jokingly wrote of moving to Europe merely to enjoy the simplicity of 25Hz timecode—25 Hz for everything. The use of 29.97 Hz for NTSC compared to the mono-

**I**n modern production, video signals must be absolutely coincident in time and phase to allow for seamless cuts, mixes and special effects.

chrome 30 Hz represents an error in timing of 0.1% or 3.6 seconds (108 frames) an hour.

The drop-frame timecode correction system "reflects real time" in SMPTE parlance by dropping the 108 frames over the one-hour period: dropping the :00 and :01 frame numbers every minute except at the 10, 20, 30, 40, 50 and 60-minute points. The system has been a pain due to editing-point calculations.

This is less true in nonlinear systems and, hopefully, will become almost invisible in the future. On the subject of using standard or drop-frame timecode, I recommend using non-drop-frame if the material is short and has no possibility of being used in a 20-minute or longer piece.

Timecode across the Atlantic divide really creates problems in the conversion of the two standards. A video signal with VITC (vertical interval timecode) routed through a standards converter will not have timecode at the output. On the other hand, LTC (longitudinal timecode) will be

frame-inaccurate because of the video delay and no real relationship between the frame count.

Next time, we'll be looking at compression and how those xPEG standards treat both video and audio. ■

*Paul McGoldrick is a technical and marketing consultant who has been in the broadcast industry for 30 years.*

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# NEW PRODUCTS



## A-T STUDIOPHONES

New from Audio-Technica (Stow, OH) are the ATH-M40 and ATH-D40 closed-back headphones for professional studio monitoring. The M40 features a flat, extended frequency response, while the D40's bass-enhanced frequency response is ideal for drummers or bassists. Features include strain-relief cabling and comfortable circumaural earpieces that are rotatable for one-ear monitoring. Both models use neodymium magnets and low-mass, copper-clad, aluminum-wire voice coils.

## 3M 986

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3M (St. Paul, MN) now offers 986 (formerly 966) tape. Type 986 is a versatile, high-output, music-mastering tape that works equally well in a multi-track recording session or a music library program. 3M 986 can be recorded in the standard +6 operating level, and it is bias-compatible with other high-output music mastering tapes. It offers an output signal-to-noise ratio of 76.5 dB.

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## SPIRIT PROTRACKER

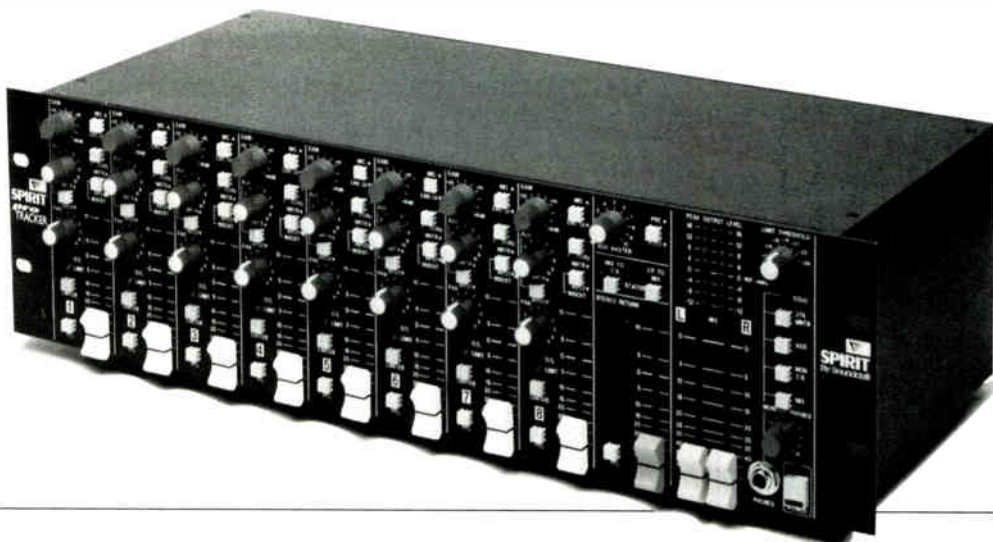
ProTracker from Spirit (Sandy, UT) is an 8-channel, in-line, multitrack recording mixer in a three-rackspace enclosure. Each of the eight channels (16 in remix) features balanced line and mic inputs with 48VDC phantom power, along with switchable limiters on each channel, PFL, overload LED indicator, highpass filtering and direct channel output. Other features include a stereo effects return, 2-track monitoring return, LED output meters and expansion sockets for daisy-chaining multiple units. In addition to studio applications, ProTracker can function as a live board with simultaneous recording capability.

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## TIMELINE GOES PENTIUM

TimeLine Vista Inc. (Vista, CA) has announced that all of its TimeLine DAW-80 digital audio workstations will contain upgraded Intel Pentium processing power.

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## NEW SOUNDTRACS CONSOLES

New from Soundtracs (dist. by Samson of Hicksville, NY) is a complete range of entry-level consoles under the Topaz banner: The Topaz Mini, Topaz Macro, Topaz Maxi and Topaz Project 8. The Mini provides four mono and four stereo inputs plus two stereo effects returns into a stereo output. The Macro has ten mono and two stereo inputs, plus two stereo effects returns into a stereo input. The Maxi comes in 24- and 32-channel versions. And by adapting four of the eight auxiliaries, the Maxi can be converted from a four-group output console into an eight.

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## SYMETRIX AGC/LEVELER

Symetrix Inc. (Lynwood, WA), manufacturer of signal processing equipment, introduces the 422 Stereo AGC/Leveler, a sophisticated automatic gain controller designed to boost stereo signals that fall below the target output level and pull back those that rise above it. The unit features a parallel I/O meter to view the input level and adjust it to the output level, threshold control for adjusting sensitivity, a response control for regulating speed and a peak limiter control for creating an absolute ceiling level. Retail is \$595.

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## DOREMI LABS

### DAWN IIMX

Doremi Labs (Los Angeles) has introduced the DAWN IImx, a low-cost, 20-bit, multitrack digital audio recorder/editor with fully integrated on-board mixing capabilities. Its recording media is either a hard disk or a removable optical cartridge. The basic recorder has eight tracks with two inputs, a mixed stereo output, and two stereo aux sends/returns. Volume, pan, mute, solo, parametric EQ and mixing all exist in the digital domain via an onboard DSP. I/O file formats are compatible with existing DAWN formats, AIFF and OMF. Retail is \$10,500, including software.

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### dbx TUBE MIC PRE/LIMITER

New from dbx (Sandy, UT) is the 1650T, a high-end mic pre/limiter using four 6992 tubes to provide extra headroom while retaining sonic purity. The 1650T's mic pre features a 154dB dynamic range and can accept the speaker output from a 100-watt guitar head through its line input without an attenuator and still not be overdriven. The processor's four tubes handle three gate stages and a gain-reduction stage; audio doesn't pass through silicon until the output stage. The unit features 48-volt phantom power and VU meters for signal monitoring.

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### PASSPORT MASTER TRACKS PRO 6.0

Passport Designs (Half Moon Bay, CA) has released Master Tracks Pro Version 6.0 for both Windows and Macintosh platforms. A 64-track MIDI sequencer, the software features SMPTE lock, MIDI Machine Control, OMS support, Standard MIDI File import/export, a velocity window, velocity tails, ghost notes superimposed within the pitch bend, channel pressure, key pressure, modulation and velocity windows, with toggle on/off, and a big counter to allow the monitoring of a sequence at a distance. Retail is \$149.

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**SOUNDTECH ST5T MONITORS**

SoundTech (Vernon Hills, IL) has introduced the ST5T, a compact, two-way speaker system in a molded case suitable for home studio playback applications. It features a 4-inch woofer with a foam-surrounded polystyrene cone and a dynamic dome tweeter for the highs. Retail is \$249/pair.

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**ARCHIVAL SUPPLIES**

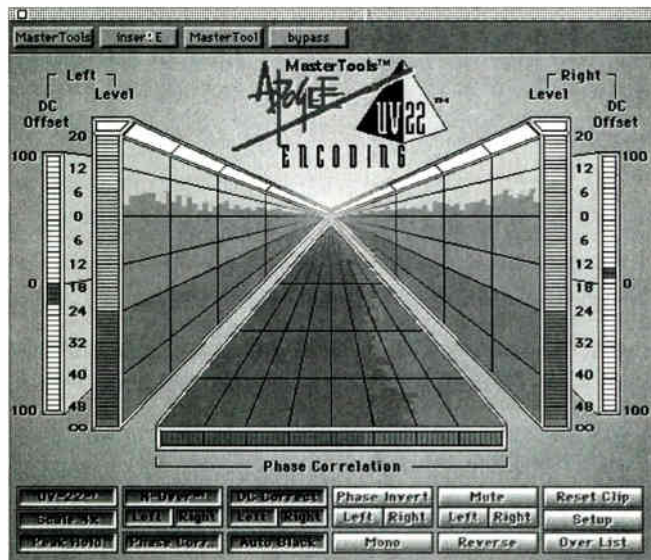
Specifically designed for the accurate and safe playback of historic sound recordings, the Audio "78" Archival Playback System from Archival Supplies (San Anselmo, CA), plays all recordings through 16 inches (20 inches with movement of tone arm), including 78s, LPs, transcriptions and metal. Speed is adjustable in 0.1% increments, confirmed by LED readout. The company also offers the Keith Monks record-cleaning machine, pre-amps, state-of-the-art reproducers for Edison cylinder players and a variety of cartridges and stylii.

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**APOGEE MASTERTOOLS**

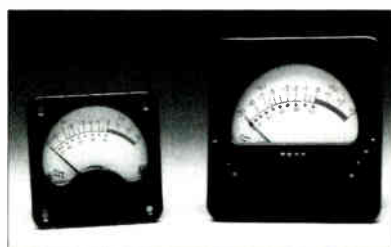
For the final step of the EQ'd master, Apogee Electronics (Santa Monica, CA) developed the UV22 Super CD Encoding process. UV22 processing is now available as MasterTools software, a plug-in for use with any TDM-equipped Digidesign Pro Tools or Sound Tools system. The \$795 software program captures resolution up to and beyond 20 bits on standard 16-bit media such as CD or DATs.

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er and an alignment tool that precisely centers the labels. Call 800/648-6787 or 203/466-5055 for info... Pinnacle Micro has cut the price of its RCD-1000 2x-speed recordable CD drives to \$1,695 (Mac version) or \$1,895 (PC version). Call 714/727-3300... Marshall Electronics is now distributing Mosses & Mitchell's self-cleaning patchbay jacks. Call 310/390-6608... Yamaha's CD Expert 4x-speed CD recorder is now \$3,495 for an internal mount SCSI II package. Call 408/467-2300... The Night Technologies EQ<sup>3</sup> Sound Enhancement System/5-band stereo equalizer has been reduced to \$3,150. Call 801/375-9288... "Babbette" is a \$119 Windows utility that converts TimeLine DAW-80 and WaveFrame files to standard .WAV format, and includes 44.1kHz to 22.05kHz conversion. Call 503/227-2273... Manhattan Production Music is adding a new CD every month to its Apple Trax library. New releases include "Grunge" and "Hot Country." Call 800/227-1954... Radio Designs RUBDA3 is a 1-in, 3-out audio distribution amp with

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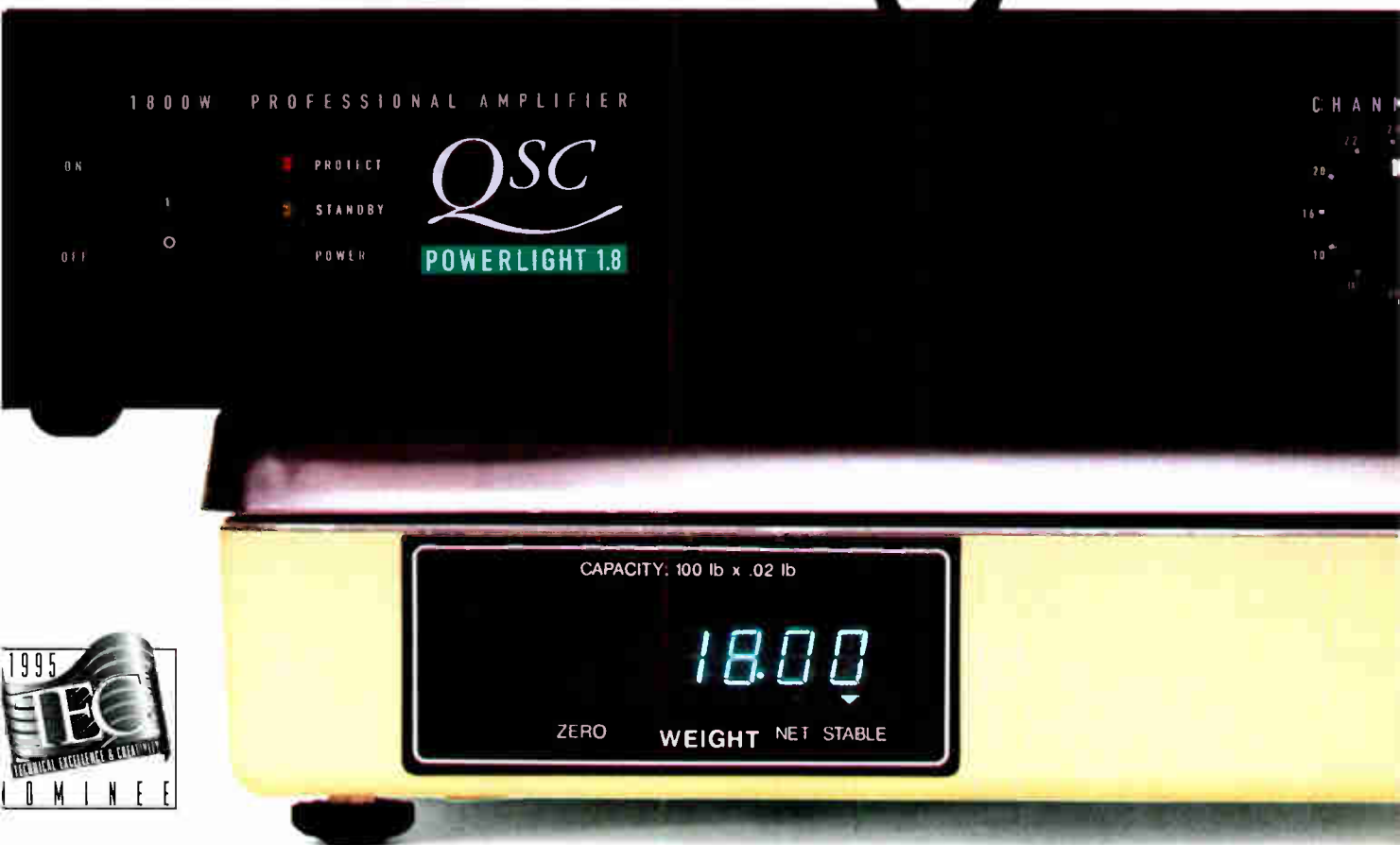
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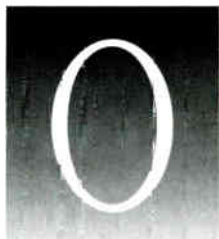
World Radio History



by Mel Lambert



# SOUNDCRAFT DC2000 CONSOLE



Over the years, Soundcraft has earned a reputation for building solid console products for professional applications. The company has always taken a fairly conservative stance, focusing on reliability, ruggedness and sound quality, rather than frills, "bells and whistles" or radical design approaches. With a design that integrates a moving fader automation system, Soundcraft developed its DC2000 over a period of time and spent two years beta-testing the control software before finally releasing the console earlier this year.

Because most DC2000 customers will probably be working alone in the control room, the console incorporates elegant moving-fader automation, with full timecode and serial control of external audio/video decks. The DC2000 automation computer is integrated into the console—no external PC is required. A built-in 80MB hard disk enables all project information to be stored and recalled between sessions. In other words, all you need to create a fully functional studio is a DC2000 and a couple of ADATs, DA-88s or analog trans-

ports—plus a video deck for mix-to-picture and post sessions. Nine-pin serial interfaces are augmented with direct control interfaces; these require little more than plugging them in, selecting the appropriate communications protocol and pressing "play."

## INPUT/OUTPUT CONFIGURATIONS

The DC2000 comes in two frame sizes—accommodating either 24 or 32 mono input channels—with or without patchbays. A 24-channel DC2000 retails for under \$29,000, a 32-channel version is \$36,000; the optional patchbay is \$5,000. Each in-line input strip has two separate signal paths, labeled Channel and Monitor. Mic/line sources connect as inputs to the Channel section, and the post-fader Channel output is normally routed directly to the corresponding tape machine track—to ensure a minimum signal path. A Group Routing matrix allows sending the Channel output to another track.

A total of eight Group output buses/tape machine sends are provided from the output of each Channel section: duplicate rear-panel

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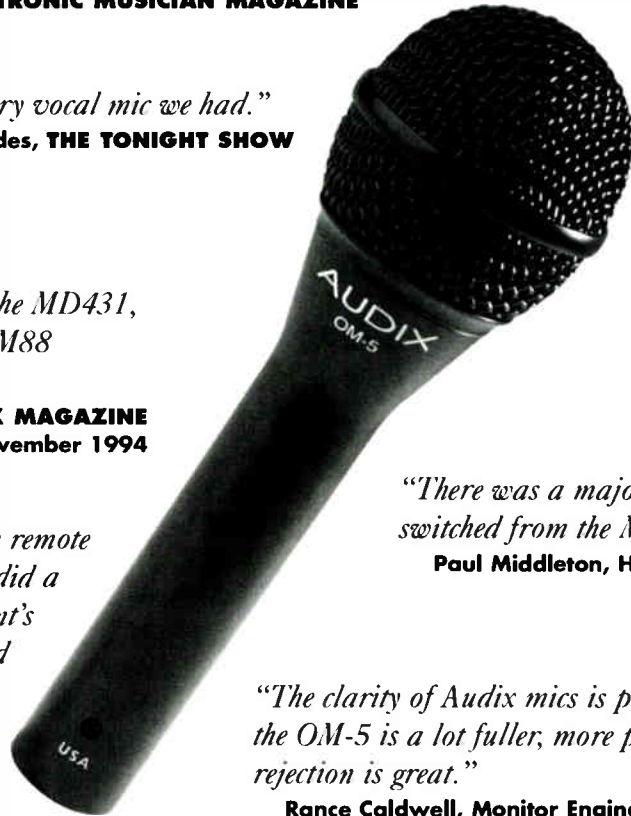
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outputs allow bus 1 also to feed tracks 9 and 17 (and 25 on the larger-format frames) of a multitrack. This eliminates the need for additional parallel output cables. The eight output groups are arranged as four stereo pairs, with panning between odd and even groups.

Unlike most in-line boards, the DC2000's designers have dedicated the lower, moving-fader section to the monitor path, while the upper channel fader is provided with a regular fader. This approach makes a great deal of sense. Most in-line boards offer a "Flip" or "Fader-swap" function, because during mixdown—when manipulating the automation's Recall and Update functions—engineers typically use the lower, long-throw faders. However, on most productions, we're working toward the stereo two-mix balance pretty much from the first day of tracking and so will probably be automating the mix as we go. Providing a dedicated lower Monitor section eliminates a lot of expensive switches and enables Soundcraft to offer a more cost-effective product.

Each channel strip features four mono Auxiliary and two Foldback buses for effects sends and headphone mixes, respectively. Aux 1 and Aux 2 are fed from the monitor path, and 3 and 4 can be switch-selected from either Channel or Monitor. Though Aux 1 and 4 are permanently set to post-fade—as most users would require—Foldback FB1 and FB2 can be selected pre- or post-fader. In addition, FB1 and FB2 can be linked to create a stereo headphone mix.

Within the Channel section of the input strip, a dedicated switch selects either the post-fader signal or the Group Output signal as the Tape Send Source, allowing signal-channel direct outputs to be set up. A dedicated Monitor Source switch selects either Tape Return or Tape Send as the monitor source, depending upon what stage of the project has been reached. Because each of these switches provides an important function, I would have preferred that they be better labeled (the "MON SRC" and "TAPE SRC" mnemonics are less than helpful) and possibly automated, enabling master or sectional reset of the entire board. Also, they could be located more conveniently at the front of the

channel strip, rather than at the top.

The EQ section is split into two separate sections: low- and high-frequency filters offering  $\pm 15$ dB cut/boost at switchable 60/120 Hz or 6/12 kHz center frequencies; and a pair of midrange peak equalizers, adjustable between 50 Hz and 1.6 kHz, and 500 Hz and 16 kHz, respectively, again with  $\pm 15$ dB ranges. Independent switches allow the LF/HF filter and MF EQ sections to be placed in either the channel or monitor signal path; a single EQ In button switches both sections in or out of the signal path. The comprehensive solo section is selectable as AFL/PFL or a true solo-in-place.

As with virtually every Soundcraft board that I have encountered—dating back to the legendary Series III and Series IV consoles—the DC2000's EQ section is flexible and sounds great. Although I would have preferred a choice of shelving or peak/dip for the LF and HF bands, the MF sections have sufficient range to reach into these often problematic frequencies.

Although it's obvious that the Channel fader determines output levels to the Group/Tape Machine Input or a direct output (it can also route straight to the L/R Mix Bus) it's less obvious what the Monitor section feeds. This would be clearer if the Monitor designation was changed to "Mixdown," or something similar. Gone are the distinctions between the monitor-section mix for the control room or studio (or foldback system) and the master stereo mix, because we now spend so much time in the studio. This may be a small point, but it's one that caused me to scratch my head more than once during a session, as I attempted to keep track of signal routings.

#### **SUBGROUPING AND TRACK BOUNCING**

I'll concede to being at first confused and then delighted by the Bounce function. According to the user manual—which otherwise, is well-written and has more information than you'll ever require—the Bounce button allows previously recorded tracks to be combined and re-recorded on a couple of free tracks.

A useful feature, I'm sure, but why label the switch for a function that you might need only once in a while—and which could be set up just as easily using the routing but-

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tons? If the function had been labeled "Sub Mix," I would not object; that designation also better describes what the switch actually does—it simply disconnects the Group routing matrix from the Channel signal path and inserts it into the Monitor path. In this way, various channels can be subgrouped during overdubs or mix-down. Alternatively, the Group Send can be picked up at a Channel Input, equalized and then sent into the main stereo mix. Either way, we have a very flexible function on a single switch, which extends the use of bus groups during mixdown, without resorting to console gymnastics or patchbay spaghetti.

In much the same way, the Group/Stereo Return sections located in the center of the console allow Echo/Reverb returns to be equalized and routed directly to the L/R Mix or to Groups for subgrouping. (Foldback sends are also derivable from these inputs.) Separate Group masters control overall levels for the four stereo group buses. Master controls are also provided for the four auxiliary sends, plus Foldback buses. During remix, a 32-channel DC2000 offers a total of 72 input sources: 32 Channel, 32 Monitor plus four stereo returns, with full EQ on just under half of them.

All in all, once the DC2000's minor idiosyncrasies have been sorted out, selecting the appropriate signal path and following its progress throughout the board's topography is a breeze.

#### **AUTOMATION AND TAPE MACHINE CONTROL**

In its sales literature, Soundcraft refers to the DC2000 as a "complete studio workstation," meaning that the mixer can handle various machine-control and related functions, in addition to mixing and equalizing analog audio signals. To a certain degree, that is a reasonable assertion.

All functions are controlled from a central section via a bank of dedicated keys, a small LCD window providing visual displays, and a touch-sensitive screen. Though it never really slowed me down, I would have preferred the window to be at least 50% larger, and viewable from more than the somewhat limited angles it currently provides. (It helps if

you remain seated at the board, and reduce the ambient lighting levels.) Various pages control system initialization; entering Project and Session data; Global Read/Write/Update automation functions; as well as storing and labeling up to 50 cue points per session.

Look closely at the screen and you'll discern the partitions that divide the active area into ten columns and six rows; 60 discrete regions are sufficient to provide reasonable resolution for even the most chubby prehensile digit. The small screen size only becomes difficult when typing in session information or labeling cue points. I would have preferred a full-size QWERTY keyboard



but, there again, most of us can get used to such inconveniences after a while—and the console surface is kept remarkably free of clutter without a keyboard!

Four dedicated buttons below the screen are designated Locate 0 and Locate 1 (to indicate the start and end timecode location of a predefined loop or rehearsal sequence), plus Drop In and Drop Out for setting up automated punch-in sequences. Auto Play and Auto Return buttons provide single-shot or looped mode. Snatching cue points on-the-fly is simple, as is labeling them within the session Project file, so you can return to them by alphanumeric title—it also makes reading through the list of data a whole lot easier!

A bank of Transport controls is provided for the master deck—either an analog or modular digital multitrack, video machine or MIDI Sequencer; other slaved machines simply chase-sync to the project's MIDI or SMPTE or timecode.

The built-in computer system handles its myriad functions speedily and seamlessly. In addition to taking care of session notes and cues, the microprocessor scans and/or moves the servo-controlled elements in

each of the lower monitor faders. Local switches fitted to each channel enable toggling through the four active modes: Manual (non-automated), Read (playback of stored data), Armed (automatic update as soon as a fader is moved) and Write (destructive erasure of mix data). In addition, several switches on each channel (Aux 1 on/off, Aux 3 on/off, Channel Cut and Monitor Cut)—plus their respective masters—can be automated. These switch functions can be selected locally, or globally from the center section. These toggles can be combined to set up sectional mixes and then gradually bring more channels into action as required.

Glide is a useful function that prevents sudden level jumps by returning a moving-fader level to its previously memorized level after a new automation pass is written to disk.

Not too long ago, VCA-based console automation was considered a luxury; without the ability to intuitively see what the relationship was between the memorized and actual fader position, it was often hard to fully appreciate its full benefits of automation. The notion of providing full servo control of every Monitor and Group Master fader on a console costing around \$30,000 is truly remarkable and a development that brings a great deal of mixing power to a wide spectrum of potential users. And though, at these prices, you wouldn't expect the faders to feel and behave like those fitted to Flying Faders, Ultimotion or a GML-equipped console, the DC2000's incarnation is smooth in operation and never put a foot wrong during my deliberations. A remarkable development from Soundcraft.

But moving-fader automation is only half of the story. The DC2000 also features full serial control of external transports, thereby eliminating another remote-control unit from the console and extending the system's functionality into other market segments. The latest software release, V6.13, adds serial control for Sony U-matic and Betacam VCRs equipped with 9-pin remote ports. Machine selection is made from the DC2000's setup menu and saved along with normal project and mix data. Version 6.13 also provides direct control for Alesis BRC and Tascam DA-88 systems via MIDI Timecode, as well as Fostex RD-8 systems (using MIDI Ma-



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chine Control and MIDI Timecode). If you discover that your favorite machine isn't within the automation system's supported protocols, then the addition of a TimeLine Lynx or Micro-Lynx system (or something similar) should solve the problem.

Mix and system data can be off-loaded to a 3.5-inch floppy drive and then stored along with multi-track and 2-track tapes. (The data is PC-compatible, allowing the information to be accessed and manipulated—and maybe archived—on an external computer.) The floppy drive is fitted into the front of the console frame, so dropping the DC2000 into a tabletop could be problematic, because it might restrict access to the drive slot. In all other respects, the system proved reliable. Enhancements in V61.3 software dramatically speed up the saving of large mixes to hard disk, as only updated data is stored with each new version of a mix, instead of re-saving all data for the entire mix after each sequential update.

#### SESSION NOTES

After a few sessions with the DC2000, I began to appreciate the concept of integrated mixing, automation and machine control. Admittedly, there are a few compromises in the system's design—including the fairly small screen display and odd labeling—but in every other respect, the console is extremely flexible in operation and powerful in its functionality. I would expect the DC2000 to form the focus of a project- or personal-use studio, if only because of its integrated features. Within a commercial post facility, the console might prove rather restricted in its functions—although a small mix-to-picture room lacking a full-function synchronizer could use the DC2000 as a controller for chase-sync lockup. (Without the ability to implement complex master-slave offsets and other timecode tricks, the DC2000's synchronization features are somewhat limited.)

But at these prices, who can complain too much? The Soundcraft DC2000 offers many functions that we would expect as extras, including machine control and moving-fader au-

tomation. The console sounds great, packs a remarkable amount of flexibility into a small amount of space and offers stunning value for the money. What more can we expect?

Soundcraft, 8500 Balboa Blvd., Northridge, CA 91329; (818) 893-4351.

#### STOP THE PRESSES!

Note: Just before we went to press, Soundcraft announced the availability of a video output for the DC2000, for feeding external video monitors. A large display area would be welcome, although it might disturb the hand-eye coordination currently available with the control buttons closely located to the LCD screen. So it goes. Another new development is the announcement of the DC2020, a version of the console tailored for the post production market, available in 24-, 32- or 40-channel frames and more flexible EQ. ■

*Former editor of Recording Engineer-Producer magazine Mel Lambert currently heads up Media&Marketing, a consulting service for pro-audio firms and facilities.*

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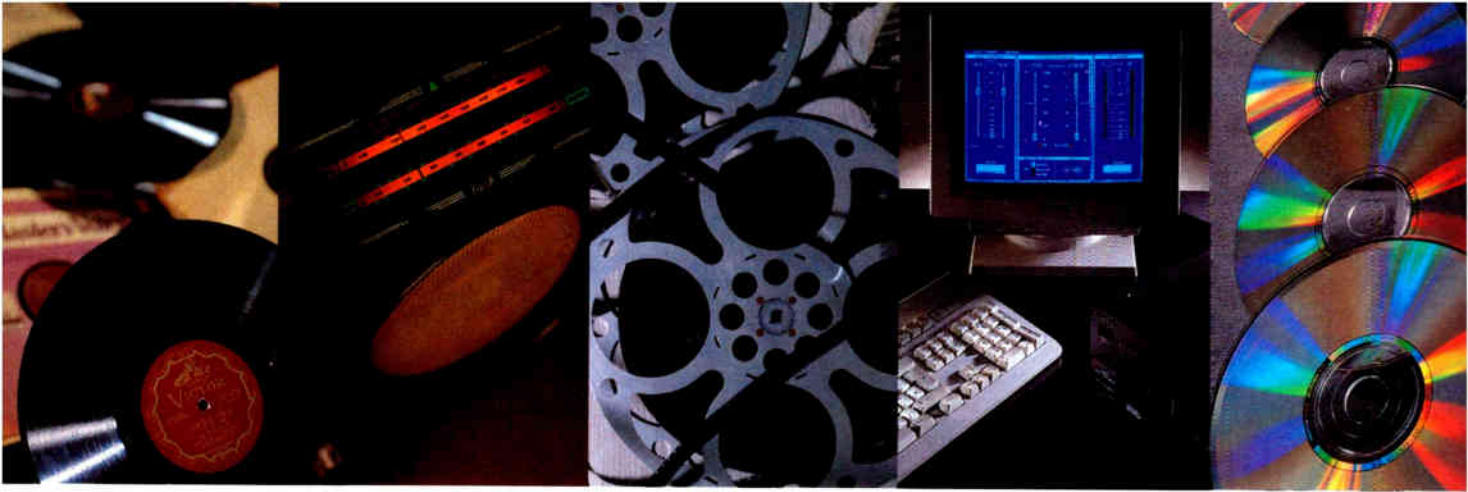
  
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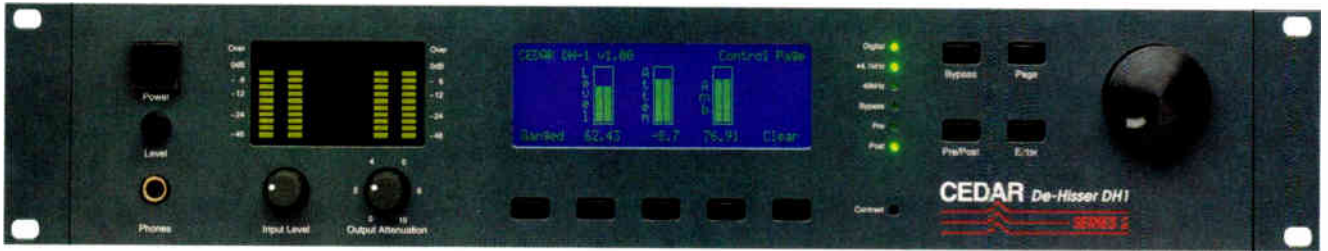
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World Radio History



by Michael Cooper

# NEUMANN KM184

## CONDENSER MICROPHONE

**W**hen I first heard about Neumann's new KM184 microphone, I felt a sense of déjà vu. The KM184, a small-diaphragm condenser mic, combines the cardioid capsule of the classic (out-of-production) Neumann KM84 with the transformerless FET circuitry of the company's KM100 Series, hence the KM184 name. To me, the apparent prospect of buying a KM140 soundalike for only \$599 (the KM184's list price) was very exciting. As it turns out, the two mics sound subtly different. The reasons for this are both electrical and acoustical.

### NOT QUITE IDENTICAL TWINS

Other than the KM140's narrow XLR-connector base, the two mics share the same cylindrical shape and diameter. However, the KM184 is slightly longer than the KM140. This is due to the KM140's longer capsule housing, which also contains the active electronics, to allow for separating the capsule and mic body. According to Neumann sales manager Jürgen Wahl, "the KM140's active capsule causes a slightly different acoustical coupling to the rest of the mic body." All of the above factors combine to impart the KM184 with its own distinctive (and very flattering) sonic character.

Ignoring the sonic differences for a moment, there are other factors to consider when choosing between buying a KM184 and a KM140. You can remove the KM140's tiny active capsule from the mic body and remote it with an accessory extension, making it an excellent choice for television or other lavalier applications. The cardioid-only KM184 does not offer interchangeable capsules (as the KM140 does). However, the cardioid pattern is the most widely used



in recording studios or sound reinforcement. And unlike the KM140, the KM184 does not offer a 10dB pad. Although it's possible to pad the signal at the mixer, there are times when pre-attenuating a mic capsule's output electronics is necessary to prevent distortion. But considering

by Phil Cochlin

# GENELEC 1030A

## POWERED REFERENCE MONITORS

**M**y first experience with Genelec monitors was a couple of years ago, at an AES show. Inside a listening suite, Genelec's entire line was arranged to create an intimidating wall of speakers. It was near the end of the day. Everybody in the room looked fatigued and ready to head for the bar until the demo started. Then eyebrows raised. Jockeying around for better position in the sweet spot, people started shaking their heads "Yes" to one another.

I asked the Genelec guy running the demo which speakers were playing. He couldn't hear me, so I pointed at one of the cabinets: a three-driver system with a 15-inch woofer. The guy smiled, shook his head "no" and pointed to the smallest cabinet in the pile: the 1031A, a two-way system with an 8-inch woofer. This produced a chorus of "You gotta be kidding!" and "I don't believe it!" from the listeners.

Having now auditioned a pair of Genelec's new 1030A monitors, I can tell you these wizards from Finland have done it again. Though the new model doesn't have the wide frequency response or power handling of the larger 1031A, the little 1030A is quite an impressive performer. Its diminutive 12.3x7.9x8.5-inch enclosure packs a lot of punch. It is bi-amplified, supplying 80 W to its low-frequency, 6.5-inch, polymer-composite cone driver, and 50 W to its 0.75-inch, metal-dome tweeter. A pair can produce 115dB SPL peaks at 1 meter with music material. Its frequency response measures ( $\pm 2.5$  dB) from 52 Hz to 20 kHz (-3 dB points).

Audio connections are via balanced XLRs (pin 2 hot). Input sensitivity can be adjusted using a rear-panel trimpot over a range of -6 to +6 dBu (referenced to an output level of 100 dB SPL at 1m). Rear-panel DIP switches provide adjustment for bass roll-off (0, -2, -4, -6 and -8dB

settings), treble tilt (shelving EQ for frequencies above 4 kHz with +2, 0, -2, -4dB and mute settings) and bass tilt (shelving EQ for frequencies below 600 Hz with 0, -2, -4 and -6dB settings). Power is supplied to each cabinet using standard, detachable AC cords. The enclosures are shipped configured for vertical orientation. If horizontal operation is desired, the "Directivity Control Waveguide" (the



little horn with the tweeter mounted in it) can be rotated 90° for correct dispersion.

I set up the 1030As and played some finished mixes for a first impression. I was disappointed. I didn't like the sound coming out of them. Something was "wrong" about it: I had expected to be knocked out by these things. Then I listened to some commercial CDs that I use as reference material. My reaction? "WOW! Perfect! Very interesting." The sad—but obvious—conclusion was that my own mixes were flawed, and the Genelecs did an excellent job of pointing this out.

I then went back to the original source tapes, carefully listening to



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both analog and digital material. After a lengthy analysis, I found I didn't like the sound of the EQ that had been used during mixing. Now mind you, this is fairly subtle stuff: There were no tremendous frequency-response deviations or anything, but the problems were there, and I didn't hear them until I monitored on the Genelecs.

With a pair of condenser mics in X/Y configuration in front of a live acoustic guitar and a group of voices, there was breathtaking stereo imaging. I'd love to know what physical and electrical properties are responsible for this. I'm sure the fact that the Genelecs are self-powered has a lot to do with it. For one thing, this eliminates the search for the perfect power amp with the ideal combination of output impedance, damping factor, etc., to match your passive monitors (not to mention the elimination of several feet of signal-degrading speaker cable).

I have since listened to a variety of material through the 1030As, comparing other monitors to them in the

process. Trying to describe the differences presents an interesting challenge. The aural subtleties don't translate well to written language. Comparing the 1030As to lesser monitors is akin to comparing an 8x10-inch photographic print made from a 6x7-cm negative to the same size print made from a 35mm negative: There is more detail and finer resolution.

I assume anyone looking for high-end monitors with dimensions as small as this intends to use them in a professional environment, such as an audio-for-video suite or as near-fields in a recording studio. The 1030A is an excellent choice in either application. Obviously, the fact that the speakers' LF response drops off at 52 Hz makes them less than ideal for setting bass levels on a dance mix, but that's precisely why we also use main monitors.

If you're planning to use the 1030As as the primary monitors in your personal/project studio, and you intend to mix music with low-bass content, you should know that Genelec offers an optional subwoofer (Model 1092A) for the system. And the same applies in audio-for-video

applications. The 1030As' bass response is probably overkill for material to be played through the typical 5-inch TV speakers. However, with the proliferation of home theater/surround sound systems, and Hi-Fi VCRs connected to home stereo systems, you want to be sure your work won't be the limiting factor.

At \$1,998, a pair of 1030As are a good value, especially if you consider that the price includes high-quality power amplification. The Genelec 1030As are exactly what a pair of top-notch monitors should be: accurate reference devices to create mixes that translate well to a variety of playback environments. For applications where audio monitors must be located in proximity to video monitors (TV or computer), a magnetically shielded version of the 1030A is available for an additional \$200 per pair.

Genelec, distributed by QMI, 25 South St., Hopkinton, MA 01748; (508) 435-3666. ■

*Phil Cochlin has spent fully half of his 40 years immersed in a world of ones and zeros. Still, he swears he's really an analog type of guy.*

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World Radio History

by Mark Frink

# LEXICON PCM80

## DIGITAL EFFECTS PROCESSOR

**T**en years ago, Lexicon debuted the PCM70, a breakthrough product: a high-quality, parameter-adjustable digital effects processor in a single rackspace. It quickly became an industry benchmark, and users began a love-hate relationship with a device that offered unprecedented control of effects parameters, but a difficult-to-learn control interface and “parameter matrix” paradigm. Along with a 72-page manual, the unit also shipped with the “Two-Minute Tutorial,” a two-sided, laminated approach to product documentation that acknowledged the end-user’s

In the PCM80, the best features of the PCM70 have been retained, along with the laminated Tutorial, and the list price is still affordable at \$2,499. The refined front-panel interface replaces the single soft knob with two click-detented knobs: a Select knob, to scroll across the now-familiar “rows” of parameters, and an Adjust knob. The up-and-down switches are still there, but the PCM70’s zero-through-nine switches have been replaced with a row of five Mode switches over another row of five switches. Press and hold each of the front-panel switches, and a



desire to begin using a new product in the first few minutes after taking it out of the box.

Lexicon’s newest digital effects processor, the PCM80, is a stereo effects unit and has two balanced analog inputs and outputs. If only one jack is inserted, the input is routed to both channels, or the output is summed to the single inserted jack. Coaxial (phono), S/PDIF, digital I/O connectors are standard. The digital input can be mixed with the analog inputs. The 2.6 seconds of maximum stereo delay can be extended to 42 seconds with the installation of 4MB, 30-pin, 70-nanosecond SIMMs (but only by qualified service personnel).

built-in help menu displays a message about that switch in the display. And by the way, the PCM80’s alphanumeric display is an easy-to-read, two-line, 20-digit display.

Each preset loads with a parameter (or two) patched to the front panel’s Adjust knob, allowing instant control of a primary aspect of the effect. Press the Edit switch, and by using the Select knob, a user can quickly scroll through a soft row of ten of the effect’s more useful parameters, and change them in what’s called Go mode. Users can now modify a preset on-the-fly, whereas on the PCM70, the cumbersome combination of the up-and-down



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and zero-through-nine keys made it difficult to change more than one or two parameters between songs.

I found the new arrangement so facile that at first I simply designed a basic reverb and then easily modified it from song to song, changing several critical parameters in the few seconds between tunes. My favorite reverb is still the old Lexicon Model 200, and the PCM80's interface allows users to operate manually, quickly reacting to the feel of the music.

In addition to Edit, the other four mode switches are for Program Bank, Register Bank, Control and Tempo; the PCM80 is always in one of these five modes. Pressing the Control keys opens an extensive, powerful matrix of control parameters, accessed by the up and down keys, while using the Select key to scroll across the rows.

Full editing of all of an effect's parameters, in the complete Edit matrix (just like in the old PCM70 matrix), is available in Pro mode. This mode offers the ability to user-assign ten parameters to be accessed in the Go mode soft row. These are working duplicates, or aliases, of ten parameters from the matrix locations. The parameters in this row can be changed, and in this way, operated as if they were in Go mode, while actually in Pro mode. If all of this sounds complicated, it's not. The designers of the unit have simply given PCM80 users a choice of working in three different operating systems:

- Beginner (just turn the Adjust knob and see what happens);
- Novice (hit edit and use both knobs); and
- Expert (full editing, a la PCM70).

The PCM80 can also be used as a split stereo effect. For example, a preset called Split C & E processes the left input with a three-voice chorus, panned center-to-left, and the right input into a three-voice echo panned center-to-right, with delay time adjustable using the Tap key. This preset is ideal for pop background vocals. Enter Go mode, and reverb—which is set at zero in this preset—can be added, with reverb time and other parameters adjusted. Enter Pro mode and other refinements are possible, such as panning the chorus voices hard left and the echo voices hard right to keep it as a true split, or spreading them out for



## A New Reverb Learns Some New Tricks

One way to test the versatility of a product is to use it in unconventional ways. My initial application for the PCM80 was simply to add a little reverb to a close-miked, live-to-DAT recording of a jazz trio. When I discovered the PCM80's RCA-type, S/PDIF digital I/O, my curiosity was piqued. Images of an all-digital editor in a single-rackspace chassis flashed through my mind, largely inspired by the PCM80's parameter-editing modes.

In Go mode, as the unit is shipped, users can gain access to up to ten choice parameters in a given effect, for adjusting commonly preferred parameters. When the unit is switched to Pro mode, however, the user has access to *all* of a given effect's parameters, which, depending on the algorithm, can number up to 100.

Starting with the PCM80's stock Small Room program, parameters were massaged to resemble the cheerfully claustrophobic nightclub where the trio was recorded. The Patching function allows assigning the Adjust soft knob to the parameters governing left and right dry-input levels, post-input effect level and the wet/dry mix percentage, transforming it into a master fader. In this customized setting, turning the Adjust knob (the range of which is also adjustable) causes the unit's audio-output level to decrease while the dry-to-wet ratio of the mix would increase. This was useful for preventing the desirable applause at the end of a tune from sounding electronic and phasy, while allowing me to perform fades on the over-all program.

Studer Dyaxis it ain't, but using the PCM80's S/PDIF ports with two consumer DATs allowed me to do some post-production editing, while staying entirely in the digital domain.

—Adam Blackburn, BlackburnDigital and Clinton Recording Studios, New York City

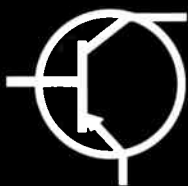
shared stereo returns.

Pressing the Store switch the first time doesn't actually store a preset, but it brings relevant information to the display, showing the current name, the target register location, and the name of the effect, if any, stored in that location (or available if the location is empty, because the machine first looks for an unused

register). Press Store a second time and the display asks, "Are you sure?" while a third press performs the store operation. Effect names can have a maximum of 12 alphanumeric characters.

During editing, a flashing Compare switch loads the original effect and allows the user to examine its parameters using the up, down and

Select keys. Press the Compare switch again to provide quick A/B comparisons of the original and new effect. An internal register stores 200 non-volatile factory presets, and memory for 50 user settings is provided. Some of the PCM70's popular sounds, such as Tiled Room and Concert Wave, are included, but they have new parameters that give them fresh possi-



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bilities. There are so many presets that, after months of using this unit, I was still discovering new sounds.

Warning: Only after several hours of experimentation will you begin to understand the full power of the PCM80. After creating your own effects, you will want to store them externally, because filling a register bank of 50 presets requires a substantial investment of programming time. A front panel accepts PCMCIA Type 1 SRAM memory cards, and up to 47 banks of 50 presets can be stored on a 1MB card (usable densities also include 64k, 128k and 256k). You can slip one of these into a shirt pocket and leave your machine behind, as long as there's another (or several) where you're going.

For hands-free operation, Adjust and Foot Pedal can be set to the same MIDI controller. This allows the primary parameter controlled by the Adjust knob to be controlled with a foot pedal also, via a rear-panel input jack. There is also a TRS jack for connecting a dual, momentary foot-switch that can be patched to various

parameters. Evolving the concept of Dynamic MIDI a step further, Dynamic Patching allows up to ten different parameters to be mapped and scaled to any of 143 different control sources, both internal and MIDI. Two or more patches can be made to the same destination, and patches can be made in a nonlinear fashion that I won't attempt to describe here, but it can become quite involved.

The PCM80 has powerful tempo features. A Tap button allows the user to tap twice in tempo to establish a delay, and the LED on the tempo switch flashes at that rate. (This can be disabled if you don't like flashing lights.) Tempo can be changed on-the-fly in any mode by re-tapping it. Many presets allow you to simply load them and tap to the music to set up for a song. Once I started using this feature, I wanted a second PCM80 to use just for delay-based effects. Tempos can be set in absolute time or in rhythmic values (fractions or multiples of beats). Tempos can also be set through MIDI, or conversely, the unit can generate MIDI clock for other devices. The Bypass switch can be set to function as an

all-mute, an input mute, or an output mute, instead of a regular bypass.

The PCM80 is 12 inches deep—1.5 inches shallower than its predecessor, which set new demands on auxiliary rack-depth dimensions. At 6.5 pounds, The PCM80 is more than four pounds lighter than a PCM70, having shed its transformer-based power supply for a switching supply similar to those used in most personal computers. The PCM80 automatically accepts any AC line input from 100 to 240 volts (50 to 60 Hz). This eliminates a troublesome aspect of the PCM70, which was always one of the first audio devices in a system to shut down in a low-voltage situation.

The PCM80 lends itself to many different applications, whether in the studio, on the road or in broadcast/post operations. Small and light enough for airplane carry-on, the PCM80 is versatile enough to create high-quality reverb effects and layered chorusing with multitap delays. If I had only one digital effect, the Lexicon PCM80 would be it.

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# C O A S T

## L.A. GRAPEVINE

by Maureen Droney

Stopped in at **Music Box Recording** in Hollywood while owner Mike Wolf was doing some engineering for



PHOTO MAUREEN DRONEY

*At Music Box Recording in Hollywood were (left to right) studio owner Mike Wolf, former Cars' guitarist Elliot Easton and producer/drummer Carmine Appice working on the Guitar Zeus project.*

the *Guitar Zeus* project. Produced by drum god Carmine Appice and engineer/producer Phil Kaffel, the album features rock guitar greats performing solos on various cuts. Some of the guest stars include Brian May, Slash, Ted Nugent and Elliot Easton. Studio owner and guitarist Wolf tells us that he bought Music Box, which was established in

—CONTINUED ON PAGE 187

## NASHVILLE SKYLINE

by Dan Daley

Much has been said and printed about the continuous influx of recording and post-production professionals into Nashville from L.A.

and New York. Quality of life and no earthquakes have been the leading reasons for coming here, and Nashville doesn't mind expanding its tax base. But it's not all huggy-lovey: the cultural differences between Nashville and the coasts have produced some friction, although no bloodshed has yet been reported. (See the Top Ten lists that cut both ways on page 188.)

As part of his transition from engineer to producer, John Guess has opened a mix/overdub/editing/mastering room in an upstairs space at Soundstage Studios. The room, a joint venture of engineer and Pro Tools whiz Marty Williams and Guess' regular assistant engineer, Derek Bason, features Nashville's

—CONTINUED ON PAGE 188

*Dark Horse Recording in Franklin, Tenn., was designed by Gary Hedden and is owned by recording artist Robin Crow. Dark Horse features a modified Trident Series 80 console, an Otari MX-80 24-track recorder and four Alesis ADATs.*



PHOTO HARRY BUTLER



# C O A S T



PHOTO: JEFFREY KLEMAN

## SESSIONS & STUDIO NEWS

by Jeff Forlenza

### SOUTHERN CALIFORNIA

Eclectic blues/rap/rocker Beck was at Hollywood's Sunset Sound doing overdubs with producers Tom Rothrock and Rob Schnapf for his latest Geffen release...The Helecasters, featuring the guitar trio of John Jorgensen, Will Ray and Jerry Donahue, completed work on their second album for Rio Records at Trax Recording in Hollywood. Label president Michael Nesmith produced the sessions, with studio owner/engineer Michael McDonald at the console... The Hula Monsters recorded their *Party Platter* CD of Hawaiian/blues/surf music (on Megatruth Records) at Bare Trax Studios in Culver City. Hula guitarist/producer Jon Bare (formerly with the Killer Whales) mixed the disc with engineer Erik Shank...Engineer/producer Bob Margouleff mixed jazz vibraphonist Lionel Hampton's latest release at The Enterprise (Burbank) with assistant Fred Kelly. And

—CONTINUED ON PAGE 187

*Jazz trumpeter Wynton Marsalis has been working on a radio series entitled "Making The Music" at NPR's studio in Washington, D.C. The 26-part educational series has included appearances by jazz greats like Ahmad Jamal, Milt Jackson and Herbie Hancock. Margaret Howze is the producer of the series, and John Carrillo (to the right of Marsalis) is the engineer.*

## NY METRO REPORT

by Dan Daley

With all due respect to Con Ed, the lifeblood of New York studios is the flow of assistants through and between them. The studios in town alternate between relating to assistant engineers as independent contractors or as staff/employees. For the most part, smaller studios tend to choose the for-

—CONTINUED ON PAGE 190

*Spike Lee was at New York's Manhattan Center Studios recording the soundtrack for his film Clockers. The score, written for a large orchestra, was composed and conducted by Terence Blanchard. James Nichols engineered the session in MCS' Studio 7 ballroom. From left: MCS executive VP Victor Moore, Blanchard, Lee and Nichols.*



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—FROM PAGE 184, L.A. GRAPEVINE

1979, three years ago when his home-based studio outgrew its beginnings. Since then, he's remodeled the facility to include a TV lounge and an enclosed parking garage.

The control room has the comfortable feel of a living room, with an automated Trident 80B console that was once owned by Phil Collins, a Studer A80 modified by Dennis Sager for seamless punch-out, and a pair of Avalon M-2 mic pre's. Wolf is also proud of his matched pair of tube Neumann U67s and the UREI 813B speaker system tuned by Coco. Other projects to the Box's credit include recording for Courtney Love and Hole's first album *Pretty on the Inside*, Andy Johns producing the Real McCoy's, and a Billy Vera and The Beaters song on the soundtrack for the ABC movie of the week *Ride With the Wind*. Upcoming bands take note: The demos that Keith Cohen produced for the Horny Toads at Music Box got them signed to Priority Records. Says Wolf, "There's a certain niche that we try to fill, and I think we do a good job of it."

**Brave New Radio.** That's what producer/engineer Richard Bos-

worth and his partner, executive producer Brian Dean, call their syndicated radio program. Currently running on 200 college stations, the one-hour show features live performances and interviews with cutting-edge bands. Described by Bosworth as "sort of like Letterman's *Late Night* but all about music," it's hosted by ex-Dramarama founder Chris Carter and his sidekick Bill Moriarity.

Taped mainly at Devonshire Studios in L.A., Brave New Radio also goes on the road, with recent episodes from Austin's South by Southwest music showcase. Each show is recorded over a six-hour period, through Apogee filters live to hard disk with backup to three linked ADATs. "So far we've only used the live 2-track monitor mixes, and I plan to keep it that way!" Bosworth laughs. When the show goes out of town, the team sets up their studio in a hotel conference room and brings on the bands. Bosworth, who carries ("Well, actually someone else carries them.") his Fairchild limiters, API mic pre's and EQs for those out-of-town gigs, is especially proud of the show featuring Brian Wilson, who played piano and sang with the pop band

Wondermint.

**Short T-T-Takes: Tascam**, based in Montebello, proudly announced the sale of 28 DA-88s to Sony Pictures post-production, where they were used on the big screen's *Crimson Tide* and *Forget Paris* and television's *NYPD Blue*, *Chicago Hope* and *The Marshall*. Audio Intervisual Design honcho Jeff Evans handled the sale and was spotted celebrating at several Culver City night spots. In O.C., **Creative Media's Tim Keenan** responded to our MJJ theory of studio success with "Michael Jackson's not doing any recording down here in Orange County, and we're still busy!!!" Keenan purchased a Roland DM-800 workstation—one of the first in the country—and has been pleasing corporate clients Infinity and Chiron-Vision, along with completing a one hour TV special about Children's Hospital L.A., called "Miracle Makers." **Siemens Hollywood** has added two new demo rooms to its office—one showing all three of the Logic Series consoles in a surround sound post environment, the other containing a Capricorn console set up for music mixing.

Fax your L.A. news to Maureen Droney at (818) 346-3062. ■

—FROM PAGE 185, SESSIONS & STUDIO NEWS

Virgin recording artist Paula Abdul was in tracking vocals with engineer Tom Russo and assistant Jeff Griffin...Danish DJ/remixers SoulShock and Karlin produced two songs from Tupac Shakur's smash album *Me Against the World* at Record Plant/Hollywood...American recording artist Frank Black was at Sound City Studios (Van Nuys) producing his latest with engineer Matt Yelton and assistant Billy Bowers...

#### NORTHEAST

Keyboardist/vocalist Ivan Neville recorded and mixed his latest for Iguana Records, *Thanks*, at The Power Station. Neville co-produced the album with George Recile and Rob Fraboni, and co-engineered with Dan Gellert, Peter McCabe and Fraboni. Guest musicians on the album include Keith Richards, Bonnie Raitt, Branford Marsalis and father Aaron Neville...Bluesman Johnny Johnson was *The Magic Shop* (New York City) recording overdubs for his latest MusicMaster release, which was

produced by Jimmy Vivino. The project was mixed and engineered by Steve Rosenthal, with Joe Warda assisting...Singer/songwriter Susan Werner recorded her Private Music debut, *Last of the Good Straight Girls*, at House of Music in West Orange, NJ, with producer/musician Fernando Saunders and engineer Dan Grigsby. Guest musicians on Werner's folk album include Marshall Crenshaw, Mitchell Froom and Zachary Richard...Missouri rockers The Bottle Rockets traveled to Brooklyn, NY, to record their new East Side Digital release, *The Brooklyn Side*, with producer Eric "Roscoe" Ambel and engineer Albert Caiati at Coyote Recording in Williamsburg, NY...Joan Jett was at The Music Palace (West Hempstead, NY) mixing the song "Cherry Bomb" with producer Kenny Laguna and engineer John Aiosa...

#### NORTHWEST

Neil Young and Pearl Jam were at Studio X/Bad Animals in Seattle tracking songs for Young's upcoming Warner Bros. release, with producer Brendan

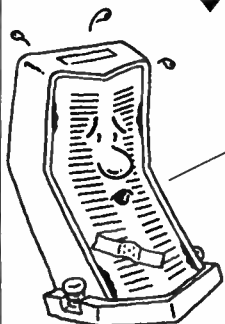
O'Brien and engineer Brett Eliaison...Punk rockers Jawbreaker tracked and overdubbed their debut for Geffen Records at Fantasy Studios in Berkeley, CA, with hot producer Rob Cavallo (Green Day) and engineer Neill King. Producer Kevin Elson was also in mixing live Aerosmith tracks for an upcoming Geffen release with engineer Tom Size...Chuck Prophet (formerly with Green on Red) recorded a solo release with producer Steve Berlin and engineers Dave McNair and Andy Taub at San Francisco's Coast Recorders...Engineer Lisa Richmond worked with The Other Side (a duo of singer/songwriters Chris Weipert and Carin Anderson, plus guest studio musicians) at Dance Home Sound in Emeryville, CA...

#### NORTH CENTRAL

Sonia Dada recorded their soulful Capricorn release, *A Day at the Beach*, at The Chicago Recording Company. Sonia guitarist/songwriter Dan Pritzkner produced the CD with engineers Paul Ebersold and Chris Shepard...

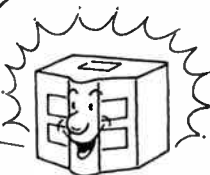
—CONTINUED ON PAGE 189

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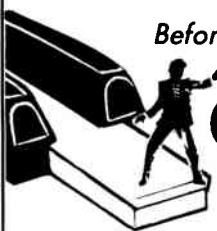


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—FROM PAGE 184, NASHVILLE SKYLINE

first Harrison Series Twelve board—and one of the first for that console in a purely music application—a 64-input, four-layer, fully automated console. The studio, known as **The Work Station** (on our cover) and designed by Guess and Mike Cronin, is intended to support Guess' burgeoning production work (the first session will be his second record production for artist Linda Davis) and mastering by Williams, but could be available for hire at times, Guess says.

Meanwhile, **Masterfonics** has chosen the console for its Tracking

Room, which will open at the end of the summer. A 64-input SSL 9000J will go into the Hidley-designed room. This marks the third 9000J install in Nashville (the other two will be at Starstruck Entertainment's nearly completed facility on Music Row), nearly half the announced number ordered worldwide from SSL as of early May. At the same time, according to Masterfonics chief engineer Frank Wells, the studio is about to launch a maintenance service division available for hire by any area studio. Maintenance engineer Ben

## Top Ten Things Music Industry Transplants Don't Like About Nashville:

10. Grueling three-session-a-day schedule leaves little quality time with your hair.
9. First they don't want any drums, now they want drums!
8. Dance remix engineer specialists still not fully accepted; often asked to feed the cats and empty ashtrays after sessions.
7. Local engineers fail to respond to the term "habe."
6. The phrase, "Is that a gun in your pocket or are you just happy to see me?" not necessarily an either/or proposition among country artists.
5. Despite the fact that they speak English, we still can't understand cab drivers' accents (New York only).
4. Annoying ability of local producers to actually recognize when something's out of tune.
3. Bass boats useless for surfing.
2. Lack of regular seismic activity and tectonic plate realignments causes roadkill to stay for days.
1. You people can't drive!

## Top Ten Things Nashvillians Don't Like About Music Industry Transplants:

10. Transplants believe Pete Anderson rumor that Nashville is "just like Bakersfield except with fewer Chinese restaurants."
9. Think a leather jacket makes you a good guitar player, when everybody here knows what you really need is a plaid shirt.
8. Can't understand why two seasons—hot and hotter—should be such a problem.
7. Keep showing up at Sunset Grill and asking to be shown the Michael Todd room.
6. Really love to record here but brought their own home studios from L.A. "just in case."
5. They refuse to disclose secrets to successful parallel parking.
4. They don't understand the efficiency of fishing with high explosives.
3. They haven't grasped the inverse ratio between quality of neighborhood and caliber of bullet holes in street signs (Compton arrivals excepted).
2. Keep trying to use traffic delays as excuse for late session arrivals.
1. You people can't drive!



Williams has been hired, and the studio is also planning to create a niche manufacturing department, under the name Master Technologies, to design and manufacture specialized audio equipment, such as -10/+4 interfaces, distribution amplifiers and additional versions of the customized headphone box that the studio is building for its tracking room.

**Woodland Digital** opened its third room in late March. Known as Woodland III, it's a joint venture between Woodland owner Bob Solomon, designer Steve Durr and Steve Hennig, Durr's partner in the now-closed Imagine studio. The room features the vintage Class A discrete API console from Imagine that was originally in RCA Studio—the same one that Elvis Presley and Patsy Cline tracked through. The Hildley-designed room has a redesign by Durr and is intended to be a state-of-the-art overdub room, according to Solomon, who says the room will go for \$850 per day, with some other vintage gear, including a Telefunken 250, included. ■

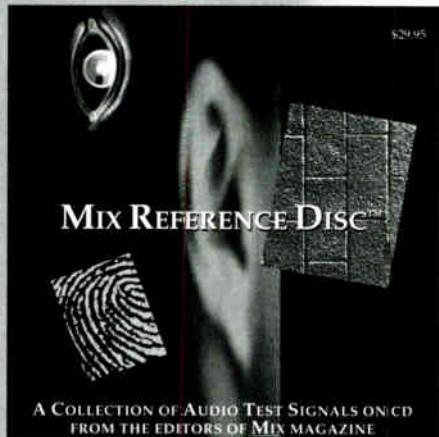
*Dan Daley is Mix's East Coast Editor and resident cynic. Call him at (615) 646-1100 or fax (615) 646-0102.*

—FROM PAGE 187, SESSIONS & STUDIO NEWS  
Alligator recording artist Lonnie Brooks was at StudioMedia Recording in Evanston, IL, doing guitar and vocal overdubs with engineer Sam Fishkin and assistant Andrew Arbetter for his upcoming CD...Chicago pop band 92 Degrees recorded their self-titled debut for Black Vinyl Records at Short Order Recorder (Zion, IL) with engineer/producer Jeff Murphy...Qwest/Warner Bros. recording artists Tenderloin were at Red House Recording (Lawrence, KS) tracking and mixing with producer/engineer Ed Rose and assistant Brad Barrish...

**SOUTHEAST**

Chicago's R&B groovemaster R. Kelly spent some time at Miami's Criteria Studios producing tracks for his latest Jive Records release with engineer Peter Morkin and assistant Mark Gruber...Blues harmonica-man Junior Wells tracked and mixed his latest Telarc release, *Everybody's Gettin' Some*, with producer John Snyder and engineer Fred Hill at Dockside Studios in Maurice, LA...Power trio Menthol

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—FROM PAGE 179, NEW YORK METRO

recorded and mixed their Capitol Records' debut at Atlanta's Triclops Studios with producer Brad Wood and engineer Jeff Tomei...Giant recording artists Green Apple Quickstep mixed their forthcoming album with producer/engineer Nick DiDia and assistant Caram Costanzo at Atlanta's Southern Tracks Recording...Blues-rocker Tony Sarno was at Crosstown Recorders (Memphis, TN) recording his debut album for Icehouse Records with producer Mark Maynard and engineers Rusty McFarland and Rick Caughron...

**SOUTHWEST**

The Reverend Horton Heat was at Planet Dallas tracking his latest Interscope Records release with engineer Thom Panunzio and engineer Rick Rooney...Country folkster Lucinda Williams was at Austin's Arlyn Studios tracking her latest for American Recording with producer Gurf Morlix and engineer Stuart Sullivan...Producer Bob Mould was at Pedernales Studios (Spicewood, TX) tracking Starfish

with engineer Marty Lester for Trance Syndicate Records...

**STUDIO NEWS**

Bad Animals/Seattle redesigned its post-production suite, Studio E, added a new Soundcraft Delta console and upgraded its PostPro system to 16 tracks...Savebone Music recently opened in New York City on the former site of the Hit Factory Times Square, with an SSL G Series 4064 console, Studer and Sony multitracks and CD-mastering equipment. Former Rolling Stone guitarist Mick Taylor was one of the first clients, recording a single and a video...Baltimore-based Commercial Refinery, which specializes in audio production for advertising and corporate clients, moved its studios to a new location at 210 East Lombard Street, Baltimore...San Francisco's Benemann Translation Center has contracted to provide foreign language translation services for TV station KTSF TV26, a pioneer in Asian programming in the Bay Area. ■

—FROM PAGE 185, N.Y. METRO

mer approach, larger studios the latter. Pay for assistants with either status ranges between \$5 and \$15 an hour, and reports of unpaid internships were rare. Another common report from studio managers is that, while they have come to rely on the audio schools as talent pools for assistants, they have a uniformly low regard for the quality of graduates. "They come in knowing the difference between a microphone and a radiator, but not the proper applications for either one," is how one manager put it.

Tony Drootin, manager of **Unique Recording's** four rooms, has a pool of about 15 independent assistants he draws on, at between \$5 and \$7 an hour. "Projects don't have set schedules, and clients like to have the same assistant on the project all the way through," he says. "You can't get that if you have staffers on regular shifts. I'd rather have salaried assistants, but it would be too expensive. And this is a pretty common practice in New York studios." Drootin also notes that a number of independent assistants are actually thriving in freelance positions, preferring the steadiness of the gig to the less-assured job of

first, but itinerant, engineer.

**Right Track's** Nancy West has four staff assistants for three rooms, earning between \$7 and \$9 an hour, with overtime above 40 hours a week. "One thing I've noticed about New York assistants is that the California engineers tend to comment on how much faster they are than West Coast assistants," she observes.

Will Schillinger, owner of **Pilot Recording Studios**, prefers staffers and has three for his two rooms, each earning between \$5 and \$15 per hour. "What I've learned is that the role of the assistant needs to be clearly defined by the studio, not by the assistant," he says. "The job description here is somewhat more encompassing than it is at larger studios, but as a result, assistants learn more and they get the chance to move up faster."

The assistants themselves seem satisfied with their lot, if for no other reason than that the often 60-hour work weeks leave little time for anything else, like a life. Interestingly, they're also not often familiar with their cohorts at other studios; the assistant's world is a narrow one in terms of professional social intercourse, and not one that lends itself to a Teamsters organizing crew.



**Chris Arbisi**, 24, has been an assistant at Sutcliffe Music for a year and a half. A graduate of the Institute of Audio Research in Manhattan, he said the schools offer more than the managers might realize; it's up to the individual how much learning takes place. He feels that the main concerns of assistants are getting in the door, getting acquainted with a proliferating array of gear, and the amounts of time they have to work. Arbisi does 45 hours a week, plus unpaid overtime shifts. "There's too many good people competing for too few jobs," he says. "The hard part seems like it's getting your foot in the door. But I think the harder part is focusing day in and day out on what it is you want in a career, then focusing on that as you work as an assistant."

**Daniel Wierup**, 23, also came out of IAR. He started his career at Right Track and moved a few months later to Battery Studios, where as a staffer he works 60-plus hours a week for \$6.50 per hour, plus overtime. While he says that his academic work had given him a good grounding, he found that there was much to both learn and relearn, as he put it, about assisting. "The things you learn in school about the actual studio environment aren't always based on reality," he says. "I see a lot of [assistants] come and go from the studios. They have expectations of the studios and the studios have expectations of them, and they don't always match up."

Finally, assistants making the transition to first engineer or music production can expect a tough financial experience, at least in the beginning. "All of a sudden you're not getting the regular paycheck, and you're waiting for the record company—your client—to pay your 30-day invoice," says Vaughan Merrick, 23, who recently left behind nearly three years as a staff assistant at Axis to go freelance as a first engineer. Merrick notes, though, that the transition doesn't have to be a traumatic one; he still pinch-hits as an assistant at Axis when the studio is short-handed and he has time. And as a freelance engineer, he tends to bring his projects back to Axis. "Works out well for everybody," he says. ■

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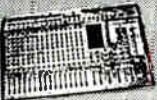
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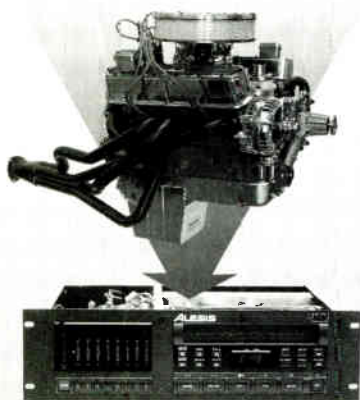
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—FROM PAGE 26, AND NOW, THE REST...

I admit that it is amazing how many visible holes you can punch through the aluminum layer and still get music, interpolated as it may be (I have one Buddy Guy CD that looks like the Horsehead Nebula if you hold it up to the light). But finally you get one star too many, and then it all goes nova.

Now CD-R isn't that much different, which is a bit surprising when you consider that the data you put on one is likely to be much more important to you, and probably much less replaceable. Where data is stamped on the far side of the resin substrate of production CDs, a carrier groove is stamped instead for CD-R. Then some soup is spun on. And this, dear readers, is where all these months have gone; I was learning about the soup. We'll get to that next. Then they replace the aluminum with gold, because it looks cooler (to you *and* to the laser), then that same old, bogus lacquer coat, and then the label. Now this is stupid, because they *know* you are going to label the thing, and they *know* that no matter how many warnings they give you, you are going to write on it with whatever you have around when you need to write on it. Glass marker or ballpoint pen; one will dissolve the lacquer, and one will crush it: There is no write way.

So what's the answer? There *is* one. A couple of companies add one more layer to this sandwich, a thick protective resin top coat, exactly for this reason; the lacquer just isn't substantial enough to withstand much wear, not to mention pens and pencils. Who does this? Kodak and Mitsui/MTC. Now, there are other companies that offer a less impressive answer to this problem but still make some effort to add protection simply by designing their labels so that the majority of the surface gets a solid coating of silk-screen ink. Ricoh is a good example of this approach. But check for yourself, as label art seems to change with the seasons.

### SOUPY SALES

Soup. The actual reactive-dye compounds, that magic organic layer that can be dark blue-gray, dark sea green or even pea-soup green, or in a few cases, light gold. With all the myriad compounds and colors that are being

sold today, it actually comes down to only two basic technologies; two types of dye: cyanine, which the vast majority of manufacturers use; and phthalocyanine, which only a couple use, and a few others buy and resell. There is an amazing amount of cross-manufacturing, cross-vending, OEM-ing and repackaging going on in the CD-R industry, by the way. If you buy a Brand Z disc this month, it might be made by company Y, but when your next carton of Brand Z comes next month, it might be made by company M. Once you find a disc that works well for you, *always* check the dye color with each new shipment! There are more than a dozen brands out there but only a few actual manufacturers! And to make it worse, the manufacturers are constantly experimenting with new compounds and changing what they ship to the repackagers, and the resellers are constantly negotiating new sources for bulk media.

The problem is compounded as there is no obligation or desire on the part of either to notify you, the end user, of these changes. This literally means that the BS-74 Edible Recordable Breakfast Disks you bought last month from Kellogg's might have been made by Taiyo Yuden, while this month's carton, in exactly the same jewel boxes, with the same part numbers and labels, might be made by TDK, and TDK might be trying out a new formula this month. If the dye color is even a *little* different, you have new and unknown media in your hand! Nice, huh?

So back to this organic soup. There are only two kinds: split-pea (green) cyanine, and chicken (yellow-gold) phthalocyanine. Almost all CD-Rs are some version of the cyanine split-pea formula, which I am rapidly losing faith in. Certain manufacturers have admitted to me that this dye family can have a virgin (raw unrecorded) shelf life of as little as *one* year, and a data-integrity life of only *five* years. In fact, *all* the manufacturers I talked to who use this dye admit to the five-year data life. No kidding! Pretty depressing, isn't it? To make things worse, the dye is very intolerant of even casual, realistic exposure to sunlight. Now, I don't mean midsummer tests in direct noon sun in the Arizona desert (though I did try that). I mean leaving them dye-side-up on a desk near a window over a sunny weekend. Dismal, huh?



MIX

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MIX BOOKSHELF is the world's leading resource for information on recording technology and the music industry. Every year, tens of thousands of music-industry professionals and hobbyists rely on our knowledgeable staff for accurate, no-hype recommendations and attentive customer service.

THIS SPRING, we're particularly excited about the books we've published ourselves over the past couple of months, including a new title from our Rockpress imprint, the new *1995 Recording Industry Sourcebook* and *Sourcebase*, the first annual *Audio and Music Education* and *Onstage* directories, and our first-ever CD-ROM: *The Allen Sides Microphone Cabinet*. Backed by the industry knowledge of the publishers of *Mix*, *Electronic Musician* and *Mix Bookshelf*, these titles will give you invaluable help with your music business or music production career. And this is just the tip of the iceberg—be sure to call for a free copy of our main catalog, with over 600 titles in all!

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- Complete specifications for each microphone, including frequency response diagrams and polar patterns.
- A color photograph of each musical instrument, with description and characteristics.
- A "Microphone Basics" section by noted author John Woram, including information on microphone design, characteristics and usage.

Mix Bookshelf



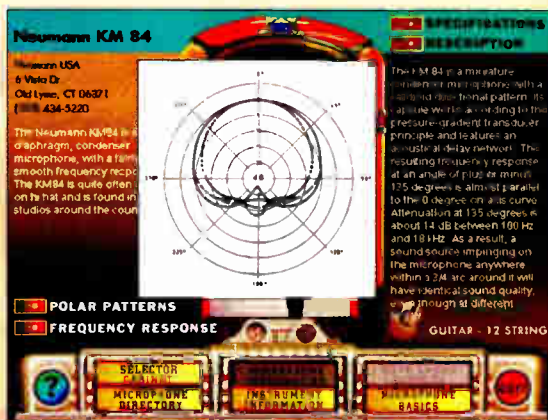
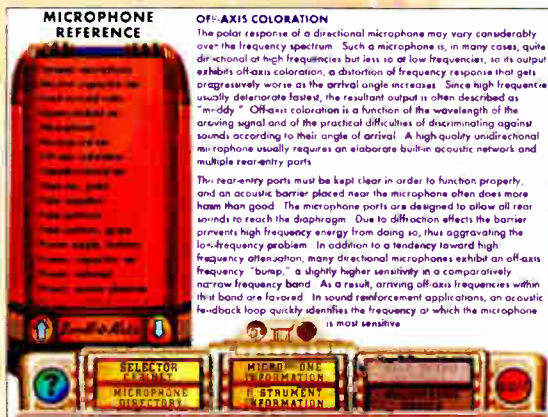
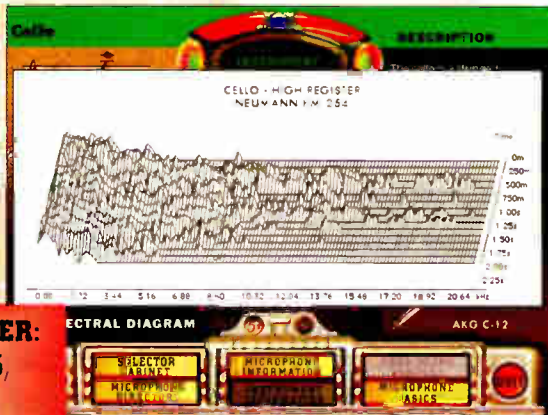
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This amazing disc features samples of 66 mics on 33 different instruments. These include six different drums and cymbals, several types of percussion, five guitars, a Hammond B-3 organ and a wide variety of brass, woodwinds and strings. The microphones were chosen from Allen Sides' world-renowned collection at Ocean Way/Record One studios in

Los Angeles, including models from: **AKG, Audix, Audio-Technica, B&K, Beyer, Coles, Crown, Electro-Voice, Groove Tube, Milab, Neumann, RCA, Sanken, Schoeps, Sennheiser, Shure, Sony and Telefunken.** You can sort by microphone to check out the best instruments for each, or sort by instrument to see which mics to use. The disc also includes a directory of microphone manufacturers and their current product lines. **Item MC) \$69.95 plus \$5 shipping and handling.**

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**David Schwartz**, producer of this CD-ROM project, is the founder and former editor-in-chief of *Mix*, the world's leading magazine for sound and music recording and production.



# New Rockpress titles from Mix Bookshelf!

We're excited to announce that Mix Bookshelf and Rockpress have joined forces to publish indispensable guidebooks for independent musicians and labels! This alliance will allow Mix Bookshelf and Rockpress to respond much faster to the needs of our customers with new books and updated versions of the Rockpress classics.

To start off, we're introducing two new titles for 1995.

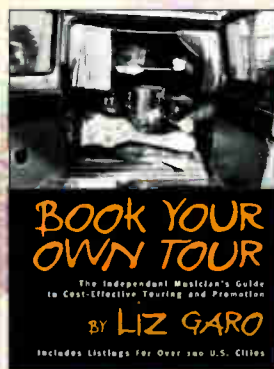


## RELEASING AN INDEPENDENT RECORD, 5th Ed.

Gary Hustwit  
©1995, 182 pp. (P)  
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We've still got copies of the 4th edition left, and we're making them available while supplies last at 25% off the cover price—only \$16.95!

Available in August, this updated edition of our #1 music business book shows, step by step, how to run your own record label and market your music on a national level. Learn how to get reviewed by the press, work with distributors, sell direct to retailers and tour behind your album. Features all-new sections on publishing and performing rights, sample contracts and a music publisher directory, plus expanded, updated directory information, including over 3,000 contacts in retail, distribution, print media and booking.



## BOOK YOUR OWN TOUR

Liz Garo  
©1995, 175 pp. (P)  
**3049A) \$19.95**

This guide to "planning and surviving an independent tour" offers city-by-city directories of clubs, promoters, record stores, radio stations, print media and other fun stuff, like where to stay for cheap and where to get good coffee and vegetarian food. Garo also includes sections putting together promo packages for clubs, dealing with club owners and promoters, getting paid and using local media, as well as sample contracts, tons of interviews with folks who've been through it all. She even provides a van buyer's guide and directions for building a loft! This is by far the most complete title of its kind.

## And check out these Rockpress classics:



## GETTING RADIO AIRPLAY, 2nd Ed.

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Learn how to get your record played on radio and make waves for your band by being smart about sending out review albums and professionally following up with phone calls. Features interviews with radio station music directors, record label promotions staff and independent artists who've done it. Includes new, updated college and commercial radio directories. **3027A) \$19.95**



## NETWORKING IN THE MUSIC INDUSTRY

Clevo & Olsen  
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Find ways to meet other music professionals who can help your career with this streetwise book. Learn how to use music conferences, video, computer bulletin boards, music associations and the press to make valuable new contacts. Includes candid discussions of label/artist relationships, music publishing and the indie scene. **3052A) \$19.95**



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If your career plan only covers gigging and recording, you could be ignoring dozens of money-making opportunities. Use this book to discover specialized niches you may have overlooked, generate extra revenue and jump-start your career. Don't spend a lifetime paying dues—explore these untapped markets and cash in now! **3045A) \$14.95**



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## 1995 RECORDING INDUSTRY SOURCEBOOK

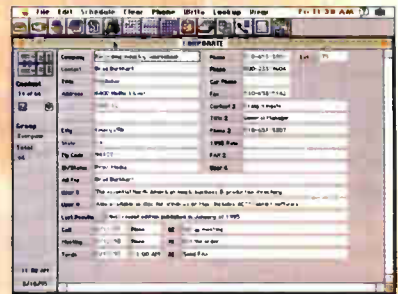
©1995, 475 pp. (Spiral) **1951A) \$74.95**

Announcement: Beginning with this 1995 edition, *Recording Industry Sourcebook* and *Mix Bookshelf* have joined forces to create North America's essential music business and production directory! This massive industry guide is a top-quality, spiral-bound, tab-divided book with over 12,000 updated listings in 55 categories. It offers comprehensive directories of record labels, producers, managers, distributors, attorneys, equipment suppliers, music video companies, media contacts and much more. Entries list contact names, titles, phone and fax numbers, styles of music preferred and information on whether they'll accept unsolicited demos.

## RECORDING INDUSTRY SOURCEBASE

We also offer our unparalleled database on 3.5" disks for Macintosh or Windows! Professional Manager gives you 55 categories covering music business and production, while Personal Manager breaks out the production categories for working musicians. Both packages include *ACT!* contact management software and a copy of the *Sourcebook* itself.

Professional Manager, Macintosh **1946MA) \$695.00**  
 Professional Manager, Windows **1946WA) \$695.00**  
 Personal Manager, Macintosh **1945MA) \$395.00**  
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## Audio+Music EDUCATION 95

### AUDIO AND MUSIC EDUCATION 1995

©1995, 88 pp. (Bound) **AME) \$15.00**

New for 1995 is our comprehensive listing of programs from all over the U.S. and Canada in music recording, music technology, electronic music, music business, audio post-production, sound reinforcement, broadcast communications and music theory. Also includes articles on careers and choosing a program, plus resource listings of industry organizations, publications and software manufacturers.

## ONSTAGE

### ONSTAGE 1995

©1995, 96 pp. (Bound) **OS) \$15.00**

*Onstage*, available in July, encompasses all segments of audio performance in a single annual directory. Listings include remote recording, sound reinforcement, lighting companies, equipment retail and rental, arenas and stadiums, booking agencies, managers, touring companies, promoters, production personnel, insurance companies, security services, corporate sponsors, festivals and more! Plus, we've included a list of high-tech services such as networks and satellite broadcast companies.



## 1995 MIX MASTER DIRECTORY

©1995, 208 pp. (Bound) **995A) \$24.95**

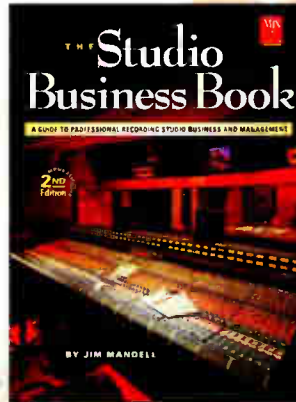
Our national business-to-business directory for the audio industry features manufacturer listings with new and current products, cross-indexed by product type. It also lists audio recording and video production facilities, sound reinforcement and remote recording companies, mastering, duplication and CD replication services, independent engineers and producers, studio designers and suppliers, recording schools, seminars and programs, trade organizations, and more.

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**MACTWEEK/ WINTWEEK**  
*Keith Seppanen*  
 ©1995, one 3.5" disk.  
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New from Mix Bookshelf—an accurate computer simulation of the tape alignment procedure for analog recorders! Designed as a supplement to classroom instruction, this inventive program is divided into three sections: Overview allows the user to explore the various components of the recorder, Tutorial demonstrates the alignment procedure step by step, and Simulation lets you perform the procedure unaided to test your comprehension.



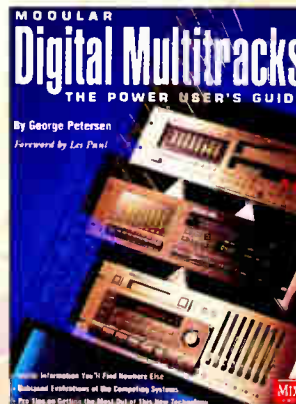
**THE STUDIO BUSINESS BOOK, Revised Edition**  
*Jim Mandell*  
 ©1995, 288 pp. (P)  
**1319A) \$34.95**

The updated MixBooks edition of this informative, wide-ranging guide offers in-depth, detailed, specific information on all aspects of putting together and managing a recording studio, including: writing a business plan; getting funding; buying equipment; determining expenses and rates; bidding on projects; developing new contacts; advertising and PR; scheduling; managing, hiring and firing personnel; and more. It also provides a reference guide to studio terms and technology, a list of industry organizations and a recommended reading list.



**MULTIMEDIA EXPLORATION: Working With Tools, Tips, Products and Sources**  
*Jamie Showrank*  
 ©1995, 311 pp. (P) with CD-ROM  
**3921A) \$38.95**

This new book CD-ROM package from CBM Books walks you through multimedia applications and authoring, the resources used in multimedia projects, and the systems that network multimedia data. Features chapters on enabling technologies, the various aspects of CD-ROMs, sound sampling and synthesis, MIDI, photo images, digital video, networking, conferencing and online applications. It also includes lists of multimedia organizations and periodicals, authoring tools, CD-ROM recorders, conferencing products and Internet packages.



**MODULAR DIGITAL MULTITRACKS: The Power User's Guide**  
*George Petersen*  
 ©1994, 128 pp. (P) **003A)**  
**\$29.95**

The only book on the revolutionary new modular digital recorders! Petersen provides unbiased evaluations of the units and their peripherals; inside tips on connecting and operating them; advanced techniques for synchronization, editing and mixing; features that aren't mentioned in the manufacturers' literature; and secret commands and undocumented error messages. And the book pays for itself, with instructions for making your own cables and snakes!

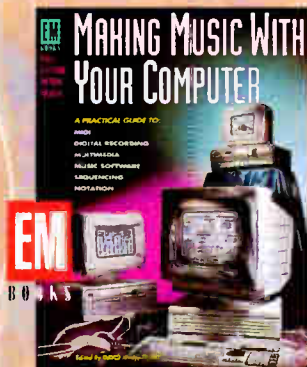


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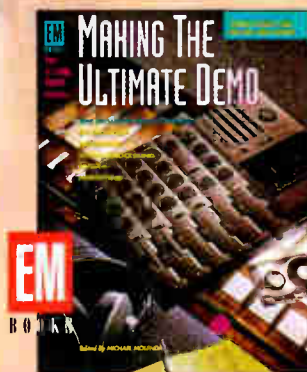


## EM BOOKS

### MAKING MUSIC WITH YOUR COMPUTER

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A valuable introduction to the basics of computer music—whether you're a computer user entering the world of music and sound or a musician searching for the right computer, this book will help you get the most out of today's electronic music technology. You'll learn how computers contribute to the creative process and get tips on selecting programs and gear, plus info on MIDI sequencing, music notation, hard disk recording and desktop multimedia, a directory of manufacturers and an extensive glossary.



## EM BOOKS

### MAKING THE ULTIMATE DEMO

Michael Molenda, ed.  
©1993, 128 pp. (P)  
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This book will teach you how to record and market a demo tape—a critical step toward gaining exposure for your music. You'll learn how to record killer vocal and instrumental tracks, use signal processing like the pros and make intelligent mixdown decisions. And once your ultimate demo is "in the can," you'll know how to release and promote your recording on a budget and approach record labels without wasting your time. Packed with tips from industry veterans, this book will improve both the sound of your recordings and your prospects for success.

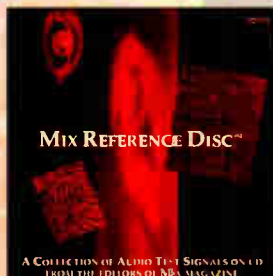


## MIX PRO AUDIO SERIES

### CONCERT SOUND: Tours, Techniques & Technology

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004A) \$24.95

Go behind the boards with today's top touring acts and learn the basic principles of live sound from the pros. Concert Sound combines exclusive coverage of 24 major tours, including U2, the Rolling Stones, Garth Brooks and k.d. lang, with practical chapters on live sound techniques and business, safety issues and new technologies. Special sections on monitor mixing, drum mixing, noise regulations and computer control make this a unique introduction to professional sound reinforcement.



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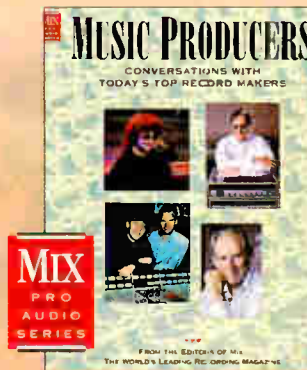


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### SOUND FOR PICTURE: An Inside Look at Audio Production in Film and Television

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Packed with film-scoring secrets! Take a look behind the scenes as top Hollywood sound professionals reveal how dialog, sound effects and musical scores are recorded, edited and assembled into seamless soundtracks. Exclusive case studies spotlight blockbusters like *Terminator 2*, *Malcolm X*, *The Simpsons*, *The Doors*, *Twin Peaks* and many others, focusing on both the equipment used and the philosophical side of sound design.



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Huber & Runstein  
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## THE MUSICIAN'S BUSINESS AND LEGAL GUIDE

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The most complete, accessible book yet on music business and law, with real-life examples that any musician can understand. **3013B) \$29.95**

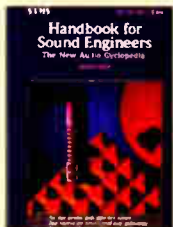
any musician can understand. **3013B) \$29.95**



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©1991, 1,506 pp.  
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The definitive pro audio technical reference, with updated coverage of sound-system design and installation, loudspeaker and enclosure design and typical audio circuitry. **1595B) \$99.95**

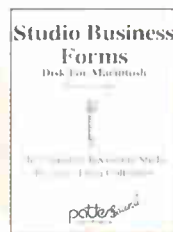
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(Spiral)  
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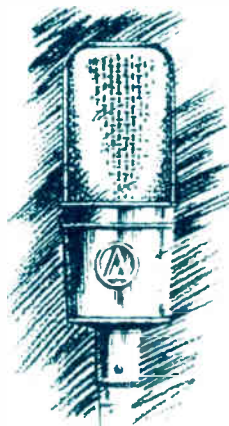


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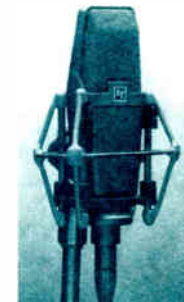
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As I mentioned, a small percentage of discs are made from the chicken-soup dye, phthalocyanine. This stuff is quite different, and testing over recent years reveals that it is much more robust. In fact, accelerated tests point to both a 100-year virgin shelf life and a 100-year data-integrity life! Now *that's* more like it, and it is this compound that I have begun to trust more and more as my research continues. In fact, I can't resist the 100-year life, so I have begun to use this soup exclusively.

You may wonder how deeply I have researched this. I have traveled to visit manufacturers, personally seen accelerated, arc-lamp, dye-degeneration curves and resulting error rates for all major brands, extorted actual plans to build the arc testers used in these tests, analyzed their spectrums and compared them to sunlight, and then even built one and did exposure-testing myself, learned the write power curve windows and tolerances for the different dyes and much more. I have come to possess piles of paper showing thermal and light-exposure-damage graphs, projected media-failure times, and write-

error rates on new, fresh media for all major brands. But, alas, I sold my soul to get this data, and I am bound to not publish the actual results at this time. I will when I can, but for now I can tell you my *conclusions* and leave it to you to decide if you want to trust me. I was willing to pursue this knowing that I would not be allowed to back my conclusions up for you, as my primary goal was to have access to this information under almost any circumstances, so that I would be able to make critical decisions affecting the safety of large volumes of personal graphic and audio data that I needed to archive myself.

As many of you have already figured out, my columns are often the result of research done to make personal buying or use decisions. In this case, I bought some media, backed up on it, and it failed! This was, as you can imagine, wholly unacceptable, and these five CD-R columns are the result that you see.

The results have convinced me at this time that there is a real and important difference in the two dye families. I, like my grandmother and her grandmother before her, believe

in the chicken soup. Who makes these, you might ask? Well, Kodak and Mitsui/MTC, the same guys that put that extra coating on. Got the picture? Now there are others using this dye, but I am once again bound by nondisclosure to not say who because some of these OEM vending contracts are complicated and sensitive, and I found this stuff out by bluffing guesses at alcohol-assisted lunches, dinners and trade show meetings. But you can find out for yourself. The dye has a distinct look, unlike any other; it is a very light, transparent yellow gold, with the slightest hint of lime green. It is almost the same color as the raw-gold color of the backside (top side).

So with that I finally close this saga and leave the subject, and wish you data so stable that your great grandchildren may read it and laugh, much as some of you might have laughed when you found a box of those old ten-dollar, 10-inch, 140K 3M or Dysan floppies you used when you began playing with computers 15 years ago. ■

*Stephen St. Croix was married once.*

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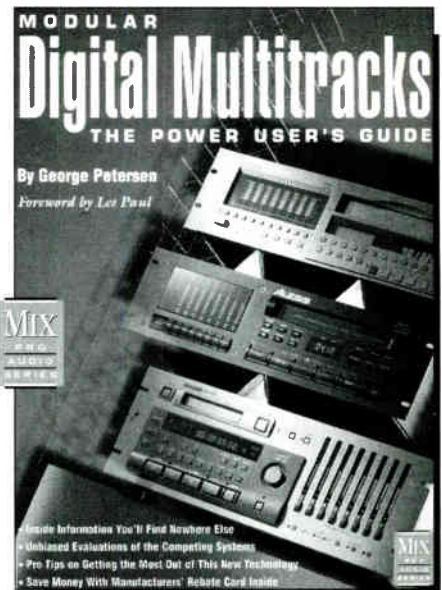
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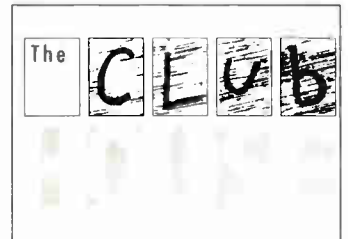
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—FROM PAGE 106, ALBHY GALUTEN

and sweetest persons I have ever met. His heart is so large, and the music he creates is breathtaking. The year that he was in the Bahamas, we were together all the time. We even got arrested together once in Oklahoma.

**Bonzai:** You did the Jellyfish records with engineer Jack Joseph Puig. How do you look at those records?

**Galuten:** In many ways, the *Bellybutton* album is my favorite record of all that I've done.

**Bonzai:** Is it a disappointment that the band broke up?

**Galuten:** Yes, it is, and looking back, I think I know why that first album, *Bellybutton*, turned out so great.

The first Jellyfish record had a limited budget, and the band really had to work together. First of all, I went into Bill Schnee's studio with Jack. It's funny, but he had never really listened to *Sgt. Pepper*. We listened to it from beginning to end, and I said, there are a lot of records out now that sound like imitation Beatles. There's Ringo's tom-tom from such and such album. It sounds like they sat there with a click track and then added each sound until it was appropriate. When I listen to those great Beatles records they still sound like performances to me. There is all the weird stuff, yet under it all you can hear a track with human beings actually performing and responding to each other in real time.

I suggested the way we do the Jellyfish record was to work like a real band, and we should go for live tracks. Except for the mixing, we did the whole record in six weeks. The record has real fire, the performances are great, solos are great. For me, it was a great experience with very talented musicians.

**Bonzai:** Are you still producing?

**Galuten:** I did a ZuZu's Petals record about a year and a half ago. Since then, I have done nothing except being the "enhanced CD guy."

**Bonzai:** Did you invent it?

**Galuten:** Well, a lot of minds have been working on the concept, but as near as I can tell, no one came up with the idea before me.

A few years ago, I got intrigued with programming and taught myself about computers. In the multimedia world, people have always thought that it would be nice to add multimedia material to audio CDs. Using the

current format, some people have released disks but the problem is that the data goes where track one would normally go. That's not good. You don't want to stick a CD in your stereo and have it play noise, or have the first song be Track 2. I just knew there was a solution, something that would work in computers but would be invisible to an audio player.

I was studying disc formats in a seminar with Dr. Ash Powa, and it suddenly stuck me that I could use the Kodak photo CD format, Multi-session, to put the Redbook CD audio in the first session and the data in the second session. With the photo CD, you can record certain material on the CD and then go back

**T**echnical innovations can be very stimulating, and I enjoy hanging around at that intersection, working with artists and programmers.

later and add more. When you record a CD, there is a lead-in and a lead-out. After the lead-out, that session is over. Once an audio player has seen the lead-out from the first session, it's over. So, if you were to put the data in another session, no audio player in the world would ever find it. I eventually contacted ION, who I work with now. We made the first demonstration of this, and the interface, and I contacted the major record labels, pressing plants, and the manufacturers who make the pressing equipment. I also contacted Apple and Microsoft to get the computer companies in the loop.

To me, it's not significant if some of the computers can't play it. As a record producer, a musician, a lover of music, I wanted to be certain that nothing ever jeopardized the audio CD. This solution seemed elegant to me, and it seemed that way to my contacts at the labels. They are all developing them now. I'm fortunate enough to sit with the RIAA every few weeks and figure out how to bring this elegantly to the public. There are a number of issues that

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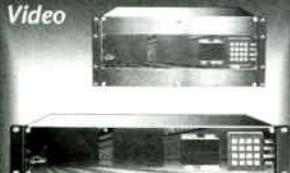
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need to be resolved, involving standards and with how the record industry in general is going to bring this out without it being a "new format." A new format is a bad thing in general. Although technically it's a new format, as long as it is completely backwards-compatible with all audio CD players, then all of your old CDs will work and the new ones will have additional material for your computer.

**Bonzai:** Using a standard CD-ROM player?

**Galuten:** Yes, but it must be a multi-session CD-ROM player, and most double-speed players do it. There may be a little modification on the software, supplied most likely right along with the new enhanced CDs. You will do a simple installation and teach your computer how to read these disks with lyrics, credits, videos, still pictures.

I foresee a time when you will listen to your CD in the stereo and hit the remote control and see information on your TV. It's just around the corner. And while you're listening and reading the lyrics, you'll be able to hit the remote to buy tickets for the band's next appearance in town. The availability of all this additional material about the band makes the CD that we have grown up with and loved more durable and more viable. The concept is that we can bring back a new version of the liner notes and the great album graphics that we grew up with in the '60s and '70s, plus some elements that are now available for the first time.

**Bonzai:** How do you make a living in this new realm?

**Galuten:** As a producer, I learned to listen with my guts and solve problems with my mind. You do a lot of left-right brain shifting. Producers may be well-suited for these new media forms. Artists are usually visceral, and computer people tend to be quite analytical. The ability to make viscerally engaging multimedia "objects" is going to require the ability to shift back and forth, to communicate. To me, it's no different from trying to use a tape loop on a Bee Gees record, or two 24-tracks instead of one. Technical innovations can be very stimulating, and I enjoy hanging around at that intersection, working with artists and programmers. ■

*Roving editor Mr. Bonzai wears enhanced shoes.*

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—FROM PAGE 118, FLEETWOOD MAC

cause I was so into doing the next [Buckingham Nicks] album, and that was kind of taken away from us all of a sudden. At that point, I separated from Keith and went off—it was that scary moment when you go from second to engineer and cut the umbilical chord.

“One night, Lindsey called me and asked if I wanted to do their live sound, which I’d never done before. So that’s what happened, and it was a great experience. In those days, they were still mainly playing theaters, and their road manager and myself were driving them around in two Avis rented station wagons. To me, that was the best time; nothing will ever beat that. Things kind of went south when success came, as far as the limos and the entourages and all the things that remove you from what it is you’re out there for in the first place. For a while there, they were the biggest group in the world, so everything came in excess.”

How he got the job on the album which became *Rumours* is “Mick put his arm around my shoulder one day and said, ‘You’re producing the album.’ The funny thing was I never really wanted to be a producer. I

thought engineering was the best thing to do because you didn’t have all the responsibility of a producer. You could get in and just do it. It was nothing but fun. It was like painting with frequencies instead of paints. The producer was the one who had to worry about all these decisions. I just had to make it sound good.”

Dashut, in turn, brought in an engineer from Wally Heider Recording named Ken Caillat to handle the primary engineering on the disc. The duo, who worked on a pair of remixes for songs on *Fleetwood Mac*, ended up sharing a production credit with the group, though Dashut says, “Just to set the record straight, Lindsey and I did most of the production. That’s not to take anything away from Ken or the others in the band—they were all very involved. But Lindsey and myself really produced that record, and he should’ve gotten the [individual] credit for it.”

Whereas *Fleetwood Mac* had been recorded in Los Angeles, “Mick thought that if he took us out of L.A. and out of our homes, we’d all have to hang out together and be forced to create together with very few distractions,” Dashut says. So the band went to the Record Plant in Sausalito,

across the Golden Gate Bridge from San Francisco. But as Fleetwood wrote in his memoirs two years ago, “As word spread around the Bay Area that glamorous Fleetwood Mac was recording, the studio’s lounges began to fill up with strangers tapping razors on mirrors.” And as their previous album continued to sell so well, the pressure was off to deliver the album quickly, and the pressure was *on* to deliver a disc that would top that album in every way. In fact, during a joint interview with *Recording Engineer/Producer* magazine in 1977, Dashut and Caillat admitted that they had set a goal to win Grammys for themselves.

Easier said than done, of course. Certainly the three songwriters in the band seemed to be coming up with great material. But they were songs born of painful experience. As Buckingham told an interviewer last year, “There was this rather unusual situation in the workings of the band where you had two couples that were in the process of breaking up during the making of the album, so you had all this cross-dialog going on [in the songs]. You had John and Christine McVie breaking up, and Stevie and myself breaking up. ‘Go Your Own Way’ was a song basically directed at Stevie.”

Added Fleetwood, “‘Go Your Own Way’ was Lindsey talking to Stevie, or *not* talking to Stevie. It was basically, ‘On your bike, girl!’ [i.e., get out!] Whenever that song was at its peak, that was Stevie and Lindsey playing out whatever roles they were playing out. I mean, some heavy stuff went on there with that song.”

Dashut’s memory is that in the case of this song, “I think Lindsey had a few lyric ideas when he brought it in [to record], but not much. He would usually start with a guitar idea, and from that would come a chorus and a verse structure and an arrangement. Then from the arrangement would come the way to do the arrangement properly, which would take days, or it might take months. It wasn’t usually preplanned in his head. It was hard work, trial and error. Then, toward the end, the lyrics would come, and they’d usually be more subservient to the melody line and the track he’d developed, rather than starting with the words and developing the track around that.

“In those days, [the track] always started with John and Mick and Lind-

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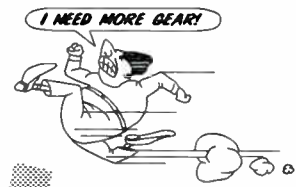
sey out there in the studio laying down the basics. Our main concern when we tracked were the drum tracks, because once you get the solid drum tracks and the timing right, then everything else can be overdubbed, which is what we did on *Rumours*. In fact, the only two instruments that were played live on that entire record—in other words, the only two instruments that were actually played together—was the guitar solo and drum track on 'The Chain.' Everything else was done at a different time as an overdub. We replaced everything many times until it got to the point where [the song] didn't feel like it was completely overdubbed."

A chart in the '77 *RE/P* shows that working in Record Plant Studio B, the drums on "Go Your Own Way," which were put on a plywood flooring right in front of a wooden wall, were miked as follows: U87s on the four toms, a Beyer M88 on the kick, a KM84 on the hi-hat, 451s on the snare and overheads and then one tube 47 about seven feet over the kick. Typically, Dashut would begin each day spending two-and-a-half hours tuning the drums, because, "If you want a good drum sound, you go out there and *make* the drums sound good because you can only do so much with the board," he said in '77. "We spent a tremendous amount of time, at the cost of a lot of studio time."

Fleetwood's odd, counter-rhythm drum track is definitely one of the key elements that make "Go Your Own Way" such a raging rocker, so the time spent was worth it. "Mick has an exquisite sense of rhythm," Buckingham told me in 1981. "He has no idea what he's doing, technically. But he's been playing the drums since he was ten, and his drumming is totally instinctive at this point. [The beat on 'Go Your Own Way'] was my idea, but the point is, Mick couldn't do the beat I wanted for the song, so he did it his way."

John McVie was set up at The Plant next to Fleetwood, in front of a bass trap. All the bass on the song is DI, though at the time, they miked his amp with a U87. For Buckingham's guitars, "We generally took a direct, sometimes with a mic on a split track," Caillat said in the interview. "We usually used two or three mics; usually a 56 up close, a 451 a foot away and another mic back ten feet. We also used Leslies [in a separate area, miked with two 87s]."

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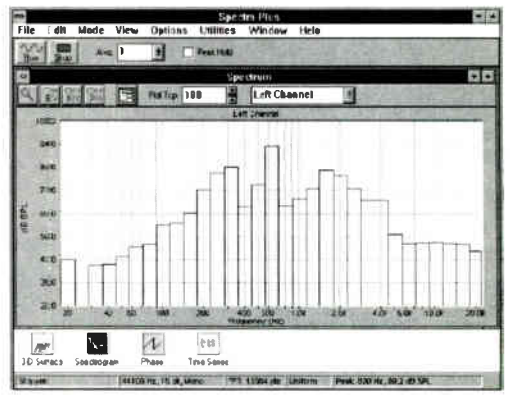
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According to Caillat, Mick Fleetwood had originally estimated that the album would take five weeks to record and one to mix. But after working seven days a week, 18 hours a day, for nine weeks in two different rooms at the Record Plant (where besides spending endless hours tuning drums, *days* were spent tuning pianos and trying to salvage tapes eaten by a faulty recorder the engineers nicknamed "Jaws"), the band went on the road for six weeks. Then the action shifted to Southern California for more tracking and overdub sessions at Wally Heider Recording (where most of the vocal and guitar parts were cut), the Record Plant (L.A.) and Davlen Recording. On tour, the band also stopped in at Criteria Studios in Miami, where more guitar overdubs were recorded.

"We knew right from the start that 'Go Your Own Way' was going to be the rocker of the album," Dashut says. "It had the high energy, and it was the most fun to work on. It probably went through fewer changes than a lot of the songs." The guitar solo at the end—"probably one of the classic solos of all time," Dashut says—was triple-tracked and edited together from different performances, as was the album as a whole. "We used over 110 reels of 2-inch tape," Caillat said in '77. "On a lot of songs, we had 30 or 40 takes and might have edited parts of five different takes to get a master take." The final mix took place at Producer's Workshop in L.A., using the studio's transformerless custom console and Stephens tape machines.

With so much tape being used and so many changes being made up to the last minute during the 11 months it took to record *Rumours*, it's not surprising to learn that "we wore out our original 24-track master," according to Caillat. "We figured we had 3,000 hours on it and were losing high end, transients and much of the clarity. We made a safety master, but much of the safety master wasn't valid anymore because we had overdubbed new parts onto it. The drums were valid, and maybe a couple of guitar parts. We ended up using 24-tracks and transferring all the overdubs on the original master to the safety master." Added Dashut, "We had no sync pulse to lock the two machines together. So we're talking about something that's really hard to do. Ten tracks, by ear, using headphones,

during 12-hour sessions, manually synching the two machines...People thought we were crazy, but it turned out really good. We saved our bass sounds and our drum sounds."

Nineteen years later Dashut says, "We spent a year making *Rumours*, and that was almost unprecedented. And most of it was hard work—trial and retrieval, re-cutting songs. It was the right way to go with that record. It would not have been the record you hear today if it had taken a month or two months or three months or however long people think a record should take. There was no compromising. It's not like we're geniuses or anything. Nobody had this in their heads and knew it was going to turn out like this. Music is not like accounting where you can take two plus two and get four, and then pat yourself on the back and say, 'Hey, I did it right.' There is no right answer in music. So the question becomes, when do you quit?"

The answer for Fleetwood Mac was December 1976. The first single, the incredibly infectious "Go Your Own Way," was released in January '77 and was an out-of-the-box smash, making it to Number 10. (The second single, Nicks' "Dreams," became the group's first Number One.) The album, too, was an instant hit, eventually rocketing into the top spot on the Billboard 200 for 31 weeks. In all, it was on the charts for nearly three years and sold more than 15 million copies—the best-selling album of all time until Michael Jackson's *Thriller* eclipsed it in 1984.

Dashut and Caillat continued working with Fleetwood Mac on subsequent releases, including the even more ambitious, costly and time-consuming *Tusk*, the greatly underrated *Mirage* and *Tango in the Night* (the last Mac disc with Buckingham and Nicks). Dashut, who continues to produce and also now runs his own record company, Orchard Music Group, has been part of Buckingham's solo records (though not Lindsey's forthcoming disc), and the two remain close friends. Caillat now works at a multimedia company called Highway One.

By the way, Dashut, Caillat and the group did win a Grammy for Album of the Year in 1977, but the engineering trophy went to Roger Nichols, Elliot Scheiner, Al Schmitt and Bill Schnee for Steely Dan's *Aja*, another album loaded with classic tracks. ■

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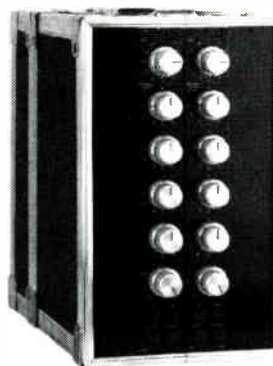
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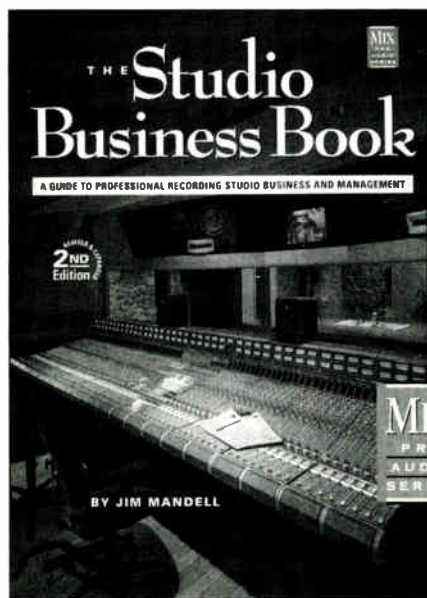
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—FROM PAGE 21, DAVID HEWITT

more types of services, such as multiple formats, interfaces, ISDN etc.?

**Hewitt:** It depends on the client and what level and types of equipment they're comfortable working on. I've had to walk a line between having a truck that meets those needs and, on the other hand, having a custom operation that only I and a couple of other people could operate. What we try to do is come up with the best possible mix. But you do have to rent major equipment, such as multitracks, quite often.

The ISDN has not been an issue because the live shows are usually done on satellite, and that's an interface with technology that the audio truck ultimately has nothing to do with. Interfaces are an issue in the sense of all the other equipment, though. Constantly more bits and pieces to deal with, but, rent and interface. On the *Die Hard 3* soundtrack we're working on now, we're doing the main recording to digital 48-track, and we're making daily backups to 48-track analog. We have a DA-88 to play back cues from. We're not using the timecode DATs, but we often do. But we are locking everything up to house sync. So it's getting to the point where it all thinks it's video anyway. (Laughs)

**Mix:** Are you finding that you're spending more time on broadcast work like pay-per-views than on album recording?

**Hewitt:** The mix of work is dictated by the revenues it takes to do it. In the mid-'70s, I remember a memo I sent to the owners of Record Plant lobbying for more video and SMPTE equipment. It said even though [video] had been only seven percent of our business, it was going to grow. I look back on it now and the percentages are almost reversed. The amount of work we did last year that didn't have pictures associated with it was maybe ten percent.

**Mix:** So are audio trucks enhancing their video capabilities?

**Hewitt:** That's been a general trend. In the beginning, you were lucky if you had a clunky black-and-white camera with a fixed lens. Now we typically have a remote switcher from the video truck and feeds from everywhere. I usually use five monitors on a job. It has evolved pretty dramatically over the years.

**Mix:** What's in store for remote recording in the near-term and long-term?

**Hewitt:** What's important is providing the working environment the client wants to work in. That's not a bread truck and an ADAT for our clients. The truck is a shell and can change with what you put in there. I think it is going to make a transition to an all-digital environment.

**Mix:** Linear or disk-based?

**Hewitt:** To me, the storage is not the issue, it's the environment. It's the transition between the analog copper and the digital fiber. It is going to gradually swing over to a digital environment. And it's going to be a tough transition.

**Mix:** Why?

**Hewitt:** Because you're mixing and matching technology.

**Mix:** You're doing that now.

**Hewitt:** But the difference is that the transition will be a fundamental one that affects the infrastructure, not just a matter of formats.

**Mix:** Do you anticipate that at some point you won't be working linearly?

**Hewitt:** I hope so. When I got into this business, I marveled at the relatively primitive technology that tape

recording is. It had always seemed kind of silly to me to be so dependent upon this oxide stuff. I came out of an aircraft and automotive technology background, which seemed to be way out in front of this business.

**Mix:** Is there a favorite project that might be interesting to talk about?

**Hewitt:** The MJQ gig is one that will always stay with me. It was supposed to be their last concert. Around 1975 at Avery Fisher Hall in New York. And, of course, like everybody's "last" concert, they went on to have many more. I've done a lot of pop and rock over the years, but jazz has a special place in my heart. Neshui Ertegun, Les Paul and his son Gene Paul, came by. Gene and I co-engineered it. Gene at the time was a staff engineer at Atlantic. It was just one of those rare magic gigs.

**Mix:** You ever going to come off the road?

**Hewitt:** I come from an Air Force family, and I can't ever foresee a time when I won't be traveling.

*Dan Daley is Mix's East Coast editor. He travels a lot but avoids trucks because they rarely offer frequent-flyer miles.*

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# FEEDBACK

## **BETWEEN THE LINES**

I am writing this note to take issue with a statement in "From the Editor" on page 8 of the April 1995 *Mix* magazine. The item in question is in the second to last paragraph and reads, "And the picture is better, with 625-line resolution."

While PAL-system television has a greater number of lines per frame (625 vs. 525, a number that includes blanking and sync information in both systems, so the onscreen image actually contains fewer lines), because the number of frames per second is fewer in PAL (25 vs. 29.97 for NTSC), there is actually a greater amount of image detail offered to the viewer per second in the NTSC system. To be specific, in NTSC, 15,734.25 lines are scanned per second, while in PAL, only 15,625 lines are scanned per second. To a viewer who is used to the 60-field presentation of NTSC, the 50-field PAL system seems to flicker. NTSC has fully a 20% increase in "temporal" resolution. For projects originating on video, this is significant.

*Steve Alpert  
Tappan, N.Y.*

## **YOUR TEC AWARD DOLLARS AT WORK**

Thank you very much for the Mix Foundation's gift of \$17,500 to the House Ear Institute from the Tenth Annual Technical Excellence and Creativity Awards.

It is a busy and productive time at the Institute. The prototype for our new "binaural" hearing aid, which will be of special help to hearing aid users in noisy environments, went to the manufacturer in October to begin clinical trials. We are also pleased to announce that the extraordinary combination of research, training and treatment in our Children's Auditory Research and Evaluation (CARE) center earned it a designation as Program of the Year in 1994 by the California Speech-Hearing Language Associa-

tion. And researchers in our Temporal Bone Laboratory have recently made some exciting discoveries in our search for a cure for Meniere's disease.

Even our Education Department is booming: To handle the demand, we had to add an extra session to our Temporal Bone Surgical Dissection Course to train ear surgeons from around the world last year. In the coming year, we will add two sections of a new course to train neurosurgeons and neuro-otologists in a very specialized area of ear surgery, skull base surgery.

Again, my thanks for what the Mix Foundation contributes to the HIP Program at the House Ear Institute. The vitality of our program and the promise of our future depend on your support.

*John W. House, M.D.  
President  
House Ear Institute  
Los Angeles*

## **WORKING WITH WIRELESS**

I am one of those "in the trenches sound types" that James D'Angelo refers to in his article, "Wireless Without Mirrors" (*Mix*, March 1995). My TV sound package includes five professional wireless microphone systems, which are used on an almost daily basis.

For two seasons on the *Cops* show, I used a wireless mixer link with satisfying success. While crossing the Atlantic, I recorded an interview with Bill Clinton and Ted Koppel on Air Force One for *Nightline*, sending all the audio to a single camera via a 2-channel wireless link (try that while flying on a commercial airline). In both cases, the production style and the speed at which we worked demanded great mobility while not allowing for any setup time.

Wireless systems have their uses, but are not the magic tool of location production as suggested by D'Angelo. Transmitting the link between mixer

and camera, as described in the article, without an audio confidence capability, has risk. True, the camera operator can monitor for drop-outs and other problems, but is predictably distracted by his or her own tasks. I still use a mixer cable with an audio return where practical, whenever mobility isn't paramount. Radio systems inherently compromise some audio fidelity and reliability.

We in the field rely on our wireless microphone systems to do more than they were designed for in a frequency spectrum that is becoming more interference-prone daily. It is through careful frequency planning, antenna selection and electrical modifications that the systems work as well as they do—in a studio or at a press conference downtown with 26 other transmitters and carrier frequencies in the room.

It's fun to use the toys, but it's always about good sound.

*Chris Borghesani  
Westport Point, Mass.*

## **MIXED SIGNALS**

I don't know if you can use this, but it really happened to me last night. I started a new project with Wayde Blair that included acoustic string bass. I asked Wayde to ask the bass player Paul Knight if he had a pickup and if so, could he please bring it. Paul replied that he did and he would. However, as the session progressed, it became apparent that the bass was strictly acoustic. When we finally asked Paul if he had brought his pickup, he replied, "Sure. It's the blue Ford out in the parking lot."

*Michael Cogan  
Bay Records  
Berkeley, Calif.*

*Send Feedback to Mix, 6400 Hollis St. #12, Emeryville, CA 94608; fax (510) 653-5142; or 74673.3672 @ compuserve.com*

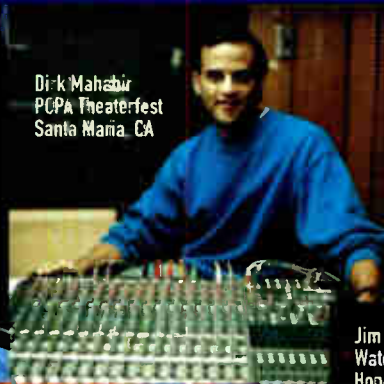


# THEY SHOWED US THEIR MACKIE MIXER

This is a tiny fraction of the mailbags of photos we've received from Mackie mixer owner's lately. All we did was place an eeny weeny ad that read "Show Us Your Mackie" in the back of a few magazines. The response was incredible. 1000's of snapshots of Mackie owners from around the world. Call us toll-free for a complete information packet on our compact mixers and 8-BUs consoles. You'll learn why no other mixer manufacturer could ever get the kind of enthusiastic response that we did.



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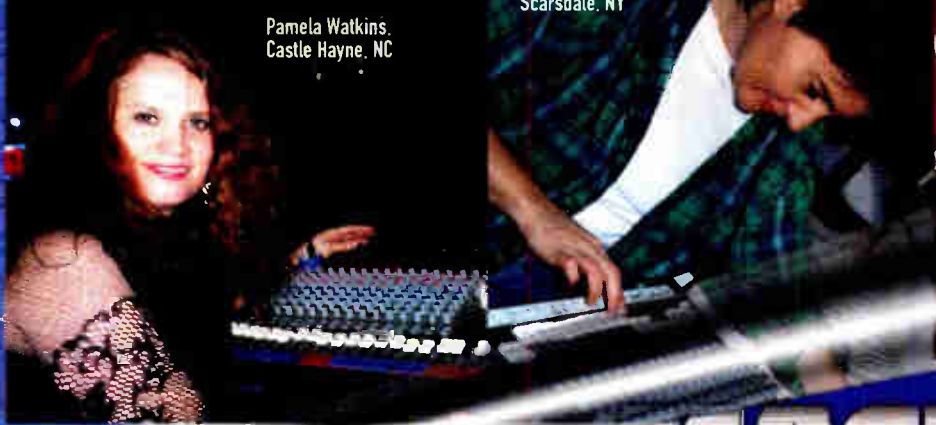
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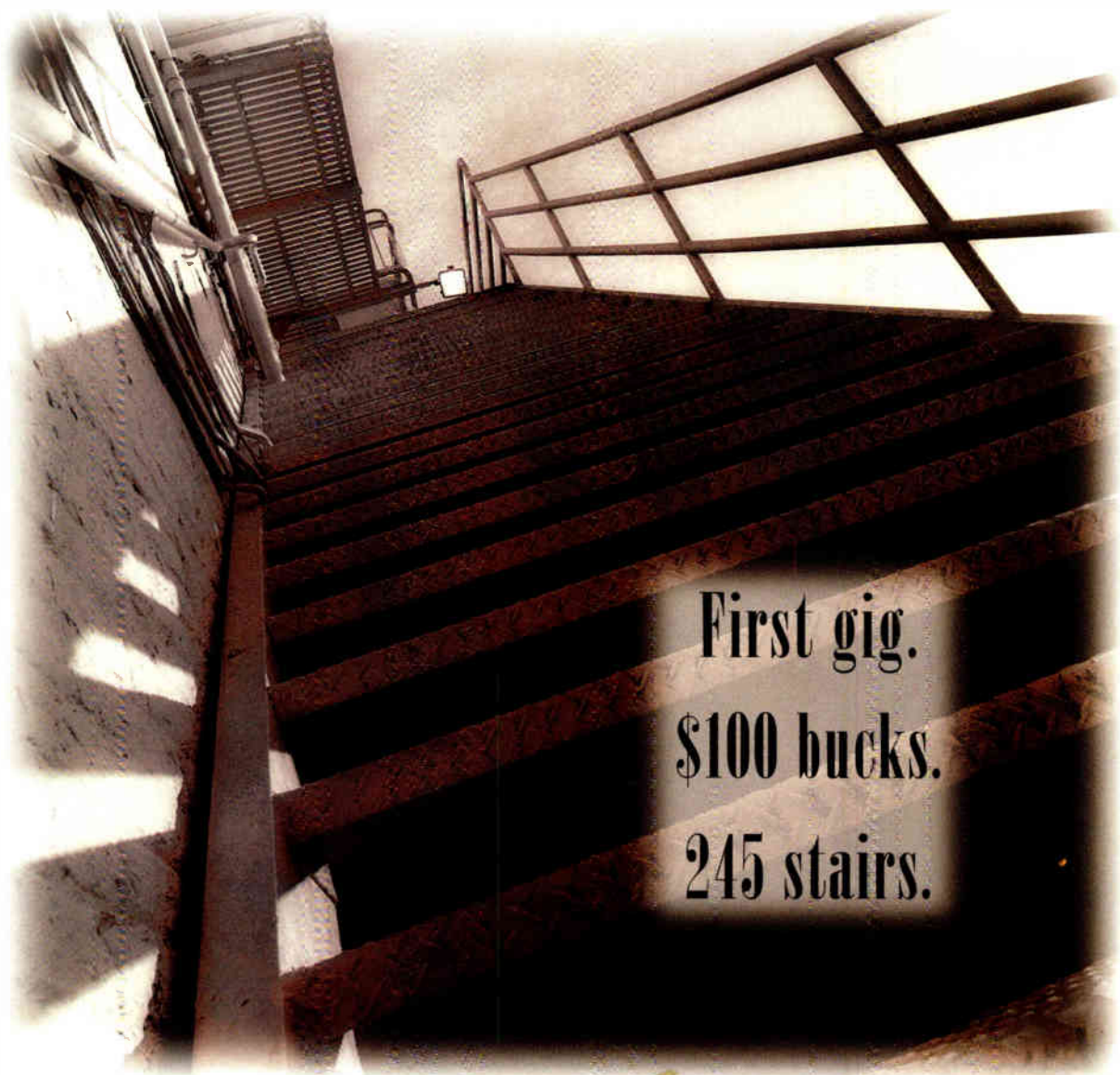


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