

E

**THE PROJECT
RECORDING &
SOUND
MAGAZINE**

OCTOBER 1996

**IN REVIEW
E-MU
TC TOOLS
DSP•FX
ALLEN &
HEATH
HUGHES &
KETTNER
GAS
COOKER**

NASHVILLE'S NEW SKYLINE

**STARRING:
TONY BROWN
AL KOOPER
RAY KENNEDY
MIKE CLUTE
BILLY RAY CYRUS
DINO ELEFANTE**

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**SEX PISTOLS IN
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Tony Brown, MCA Nashville

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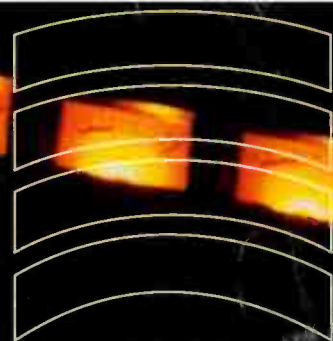
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VOLUME 7, ISSUE 10
OCTOBER 1996



ON THE COVER: Tony Brown in Reba McEntire's Starstruck Studios. Photo by Beth Gwinn.

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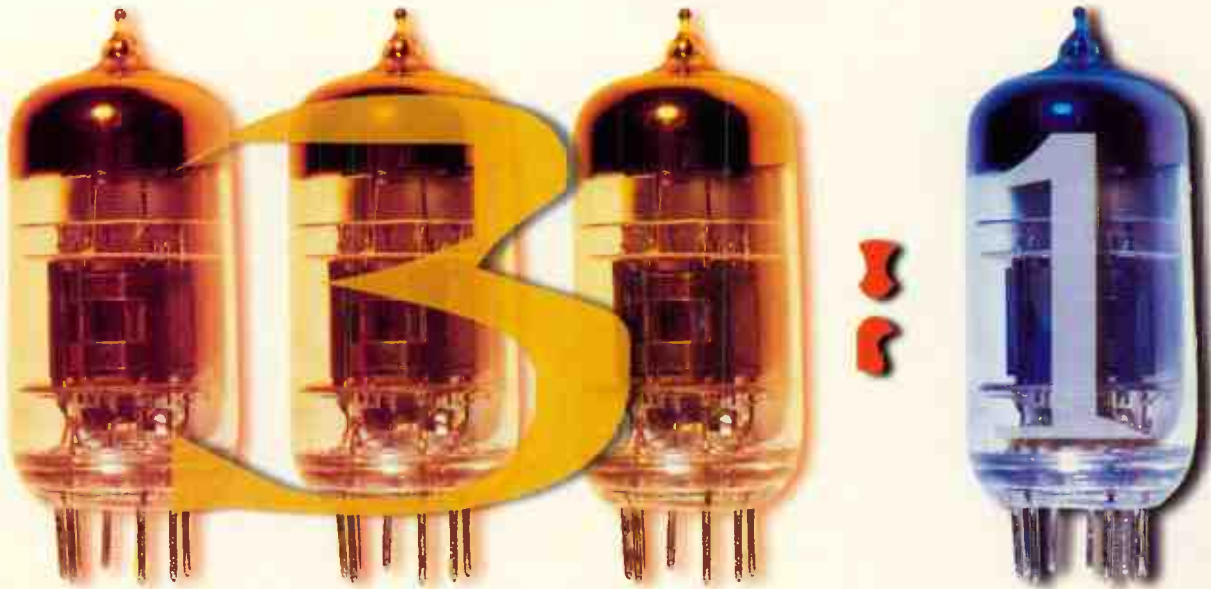
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Greener Pastures

BY BEVERLY KEEL

OLD ROCKERS NEVER die, they just move to Nashville.

Scores of middle-aged pop and rock musicians have left the big cities for the more relaxed pace of Nashville, and it looks like many of their friends are still on their way.

Michael McDonald, Steve Winwood, Steve Cropper, Al Kooper, Tracy Nelson, Kim Carnes, Rita Coolidge, Bernie Leadon, Henry Gross, Janis Ian, John Prine, Felix Cavaliere, Donna Summer, Delbert McClinton, and Reese Wynans now call Nashville home, as does Tony Joe White, The Crickets' Jerry Allison, Leon Russell, Dick Wagner (guitarist for Lou Reed and Alice Cooper), Barry Tashian, Duane Eddy, producer Bob Gaudio, and Lynyrd Skynyrd's Ed King.

When new Nashvillian Peter Frampton wanted to record his track for a Hank Marvin and the Shadows' tribute album, he went to Adrian Belew's basement, where Belew also produced two songs for the platinum Jars of Clay album.

"I remember about seven years ago, it seemed to be a place where people in rock who were over the hill could come and get something happening," says Bonnie Raitt's guitarist George Marinelli, who moved to Nashville from L.A. in '91. "That wasn't true, but it was the rap. It's a more creative spot and it's not age specific. You don't necessarily have to be a 22-year-old, great-looking person to be involved in music here, whether it's country music or anything else."

Most musicians didn't so much move to Nashville as they did flee Los Angeles and New York. They moved their families South because it was safer, smaller, and cleaner. "I can be anywhere, but I choose to be in Nashville," says Peter Frampton, who invites Nashville writers over to collaborate in the music room he's built at the end of his home. "I just find it more conducive to writing here, I guess because it's so much more laid back. It might take a little longer to do stuff here, but that doesn't bother me."

Nashville doesn't have the restaurants or hotels offered by both coasts, but it doesn't have the distractions either. "I think the metaphor it uses is like when you are driving in from the airport, as opposed to L.A., where there's a traffic jam at 4 AM," says producer Don Was, who frequently records in Nashville. "You just breeze in and breathe the fresh air."

"That's metaphorical for the record-making process there," Was says. "There's less cerebral cholesterol clogging up the arteries. People go in, they're matter of fact. They're good and they're fast. In Nashville, there's an understanding that songs reign supreme. Without a good song, it's impossible to make a good record."

Songwriting is where you see the biggest integration of Nashville's traditional country music community and the transplants. Top writers like Gary Nicholson and Gary Burr, both of whom write pop and country, frequently write with the newcomers. But except for the cowriting sessions and a few studio sessions, the two communities remain separate, forcing rockers to leave town to make money.

"We are hoping for something to qualify it as Music City USA," says Felix Cavaliere. "Right now, it's Country Music USA. The only thing I can do down here is write, which is why I moved here. The pop people down here, we don't work, except maybe a few studio players who have adapted their style to country."

While most wouldn't turn down a country cut, they're not at the risk of going country any time soon. E Streeter Gary Tallent has started his own label and produced acts that are definitely not country. "The funniest question I get is, 'Oh, you are producing country now?'" Tallent says. "Just because you are working and producing out of Nashville, it's assumed you are doing country music. I have to laugh."

Nashvillians appeared thrilled to welcome the new neighbors because it gives credibility and hipness to a city that has been considered the hillbilly cousin of the other music centers. Frampton has already graced the cover of *NashvilleLife*, and Kooper, Cropper, and others play annually at the Nashville Music Awards.

"These people know their music down here," Cavaliere says. "The regular folk, there's an acceptance if you've ever done anything in the music business. In L.A., it's what have you done lately?"

Beverly Keel is an assistant professor in the recording industry department at Middle Tennessee State University and a freelance writer whose work has appeared in such publications as Guitar World, New Country, Country Weekly, TV Time, and Music Row.

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QUIET COMPANY

I've never written before, and this isn't really of a technical nature, but I thought you'd maybe find it interesting.

Some time back I had some expensive equipment walk down the hall and out the door from my little music studio, uninsured (then); that bit the ol' butt kind of hard. In addition to a surveillance camera and window alarms, I have also employed a full-time studio employeek who works only for an occasional change of outfit and is on duty 24 hours a day, 360 days per year.

The lady in the picture is "populating" my studio, cheaply. Yeah, she's a mannequin — they're realistic and can be purchased rather cheaply, as they're rapidly disappearing from stores. They are quiet, good looking, and lightweight (about 35 lbs.).

And they *do* catch people off-guard in something other than a department store setting.

Richard H. Millette
Sunstroke Studio
Englewood, OH



QUIET COMPANY: Sunstroke Studio's glamorous security guard.

DUST IN THE WIND

Re: "Maintaining Your Cool," *EQ* July '96.

This is a wonderful "starter" article about air conditioning, but (you guys knew a "but" was coming) it leaves you with the impression that cooling the studio is just a matter of money and it has no problems at all. Since we live in a profession ruled by Mr. Murphy, newcomers of the game should be aware of the following: (1) all A/C units *will* emit noise. Granted that a vented system is the least noise producer of all, but you still will get noise in your recordings *unless* you include a noise trap in your vent route. Now there is an idea for an article, right guys? (2) Dust may be a problem depending on where you live. Some basic filters just don't cut it, and we have to be especially aware in this new digital age of dust getting in the delicate components of our expensive machinery.

Let me digress for a second with a quick dust story. Our studio is located in Caracas, Venezuela, and the area is dusty and humid (I'll get to humidity in the next point). It wasn't unusual for us to dust every darn day before starting a session with the standard filters that most A/C systems provide. Then it came: the real fine filters designed to

catch anything but bacteria, and it was great until we realized that it was affecting the flow of our system. We ended up using a combination of filters in different stages. (One great tip is to get those blue-type plastic filters that look like gigantic kitchen scrubbers and spray them with WD-40 or 3-in-1 oil. The amount of dust that they can gather is amazing, but be sure to clean them regularly if you have a dust problem.)

And (3) humidity is a nasty problem, especially because by the time you see it

it may be too late and the sucker is already messing you up. This is particularly true if you have set up your studio in an old building or you live in a very humid area. For most places, a normal A/C will take care of any humidity present, but sometimes it will not be enough, and an additional dehumidifying unit must be installed to control the problem. They are not that expensive, particularly if you compare the money you can save in repairs.

Be sure that a hygrometer, which activates the unit when the humidity level exceeds the predetermined level, is connected to your A/C system so you don't have to worry anymore. (By the way, if you are having a tough day with a client and you want to end a session within the hour, crank up the hygrometer to 30 percent and you will see the musicians, especially singers, dry up in a hurry and call it quits. OK, so it's a nasty trick.)

I agree that this is a very sketchy summary of the things that can be done with A/C, but maybe other readers can give some more input.

Miguel Gonzalez
Le Garage Studio
Caracas, Venezuela

SOFTLY SPEAKING

The entire staff of Midisoft would like to thank you for featuring our product, Midisoft Studio 4.0, in your July issue. We are all thrilled to have our products reviewed in such an esteemed music industry magazine. We are especially gratified because Midisoft's product line has traditionally been aimed at consumer users rather than at professional users like your readers.

With that in mind, I would like to take the opportunity to correct a couple of oversights in the review. The reviewer states, "there are no provisions for precise control placement (of digital audio) within the sequence." Studio 4.0 does feature "to the click" resolution of digital audio events. Digital audio events are triggered at the level of a precision of 1/96th of the current 1/4-note value. Studio's internal timer is capable of time accuracy within 2 ms. Since we buffer all digital audio playback, the digital audio event begins playing at the exact click it is set to. Feedback from our users has been that this level of precision is more than acceptable.

The reviewer also states in the "Weaknesses" section that "[Studio] cannot program time signature and tempo changes mid-song." Midisoft Studio 4.0 is capable of doing both. Tempo changes can be inserted in any location in the file via our MIDI List View. Time signature changes can be added via our Music menu, which features other notation editing features such as Key Signatures.

One last issue I would like to comment on is the review's view of Midisoft customer service and technical support. While I agree that it is always best to give support at the time a customer calls, this is not always possible when an overflow situation occurs. On reviewing our records, we found that Deborah Gerber called at 3:50 in the afternoon of March 13. Her information was taken down by our message service, as all technical support representatives were on the phone, and promised a call back within 24 hours. Deborah was called back at 8:50 the following morning by our technical support manager. A message was left on Deborah's answering machine explaining that we understood her situation and that the manager would personally be

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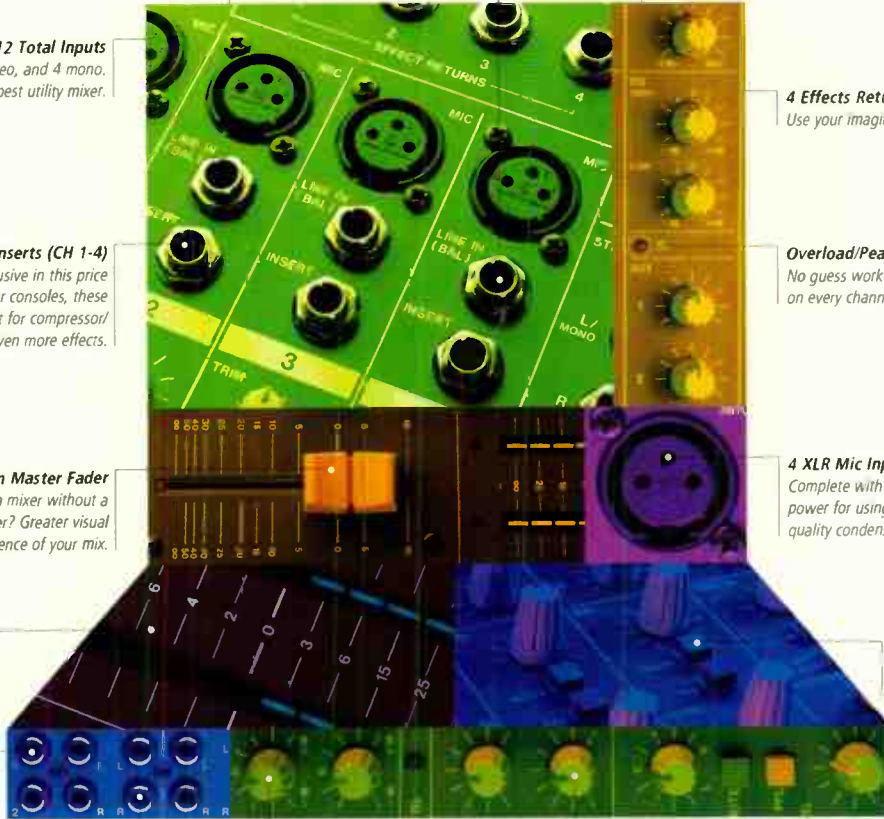
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available to answer any of her questions. We never heard back from Deborah.

Our goal has always been to make accessible usable software that allows anybody to create great music with their PC. We hope that professional user will keep us in mind while shopping for the right tool for the job. Our continuously evolving product line will continue to offer incredible ease of use, with an ever-growing list of professional quality features at affordable prices. My personal commitment to our customers is that we make, and will continue to make, products that give them more usable value per dollar than any other music software product on the market.

Joseph J. Marusak
General Business Mgr., Music Products
Midisoft Corporation

DIRECT INPUT

We at Demeter Amplification would like to thank you for your insightful "Three on Three" article in your August issue.

In regards to the unity/boost switch, the boost mode increases output by 15 dB, not 10 dB as stated. Also, each mode (unity/boost) has two distinct sounds. The unity/gain mode is taken from the cathode of the first stage and is flat from 10 Hz to 40 kHz with very low distortion. The boost mode signal comes from this second-stage plate output, creating a warmer, rounder tube sound. The review never stated which gain mode the direct box was used in. This would have a noticeable effect on the reviewers impression of the sound.

The Demeter VTDB-2B Tube Direct has been updated to meet IEC standards. The Tube Direct now features a grounded AC power cable. The original two-prong AC cable was installed to eliminate any ground-loop problems.

Publications such as *EQ* have been important in the further development of our company. We are proud of our achievements and continue to strive for excellence in all of our products.

James Demeter
President
Demeter Amplification

CORRECTION

In the September issue's *Studioware* section, Kurzweil's address was listed incorrectly. The proper address is 13336 Alondra Blvd., Cerritos, CA 90703. Tel: 310-926-3200. We apologize for causing any confusion.



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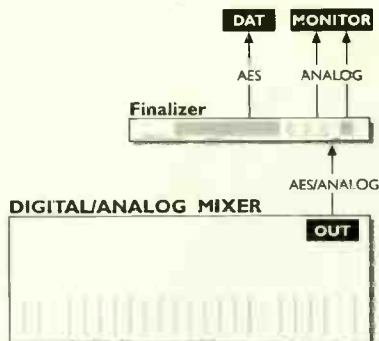
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EQ&A

PATCH THINGS UP

Q I was wondering if there was anything available for the Mac that would aid in the construction, layout, and routing of a patchbay? For example, something like a template for Filemaker or similar program.

Mike Daane
via Internet

A To the best of our knowledge, there is no software program currently available on either the Mac or PC platforms that will aid in the construction, layout, and routing of patchbays. We use a CAD program to do patchbay layout and design; however, this is for the drawing function only. The "smarts" behind the layout is done by a real, live thinking person.

The problem with doing any type of automated signal routing for patchbays is that there is such a huge variety of patchbay designs and configurations, not to mention all the types of equipment that gets connected through these bays. Any type of auto-configurator would have to be very smart and have an ever growing library of products and bays from which to design. Such an auto-configurator would also be very expensive to develop.

At David Carroll Electronics (self-serving plug), we offer two solutions to this problem in the industry: First, we have a unique product called Project Patch™, which is a plug-and-play TT patchbay system made up of bays and prebuilt cable sets (a lower cost, 1/4-inch TRS version of Project Patch will be introduced at the

upcoming AES). As a part of Project Patch we offer a configuration service where we will provide complete configurations of a patchbay system to the customer's spec. We will also be introducing Studio Kits™ in September '96. These are complete, preconfigured studio wiring systems that are based on Project Patch bays and cables. The customer only needs to specify what equipment he has and a match is made to a Studio Kit package. Further details are available at DC Electronics (510-528-8054 or fax: 510-526-1982. [Editor's Note: If any readers know of such a product, or if some inventive entrepreneur has just such a software program, let us know.—HGL]

Lee Pomerantz
Director of Sales & Marketing
Products Division
David Carroll Electronics

A A company called VDP, Inc., based in Las Cruces, NM, makes a software package called VidCad that allows sound contractors to develop draw-

ings and design layouts of sound installations. It's possible that this software may also support layouts and construction of patchbay systems. (They may not have a Mac-based version.) VDP, Inc. can be reached at: 749 Carver Rd., Suite 3, Las Cruces, NM 88005. Tel: 505-524-8959/Fax: 505-524-9669.

Jim Hoffman
Regional Manager
Switchcraft

OSCILLATING RHYTHMS

Q I have enjoyed Eddie Ciletti's articles in EQ for some while. He mentioned in his August '96 column the necessity for recording a 1 kHz tone on DATs. I have heard this several times now and, as I am in the process of making the transition into composing music-for-picture, I am trying to find out all the technical aspects that will affect my marketability.

What would you recommend as an economical tone generator? I have a Mackie 8•Bus, one TASCAM DA-88 with SY-88 [sync card], assorted sound modules, etc., but I haven't been able to find a tone generator in anything I currently have.

Any basic books you would recommend that would educate me on topics like this? I'm not likely to get down into the diodes and such, but I feel too ignorant of some basic stuff.

Gary Glover
via Internet

A There are many reasons to record tone(s) at the head of any tape. For an analog tape, multiple-frequency tones ensure consistent playback from machine to machine. With 1 kHz as reference, the high and low frequencies can be adjusted to all be at the same level (frequency extremes vary with head condition). The high-frequency tones are also used to align az-

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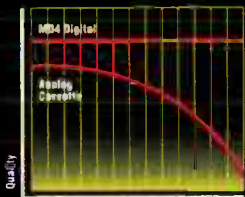
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imuth — a mechanical condition that positions the playback head gaps (the electromechanical "lenses" that bring high frequencies into focus) to be in the same place as the record head (perpendicular, hopefully, to tape travel).

For a digital machine, there are no frequency response adjustments, but there is still a need for both a reference tone and a safety pad at the head of the tape. You wouldn't want someone repeatedly playing your master mix while setting levels or, worst case, on a machine in poor mechanical condition.

I always print five minutes of tone to "burn" through the beginning of the tape, which is more likely to have dropouts either out-of-the-box or after frequent use/abuse. My tone of choice is 40 Hz because it is not painful to listen to during setup. One kHz remains the standard because it is in the middle of the frequency spectrum. You could also use tone to identify left and right channels, polarity (phase), and, again, to provide space to safely test a tape in an unknown machine. Five minutes constitutes a surprisingly short piece of tape. Several 30-second mixes could be swallowed by a hungry machine. Short-form mixes should be repeated several times on a tape for both safety and ease of use.

TASCAM and Fostex make oscillators as "accessories" for utilitarian purposes. MCM electronics (800-543-4330) also sells oscillators. Prices range from about \$75 to several hundred. Those in the battery-operated, under-\$100 range are more than acceptable.

Two excellent books you can look into are written by EQ contributing editors. Check out the latest versions of Craig Anderton's *Home Recording for Musicians* and David Miles Huber's *Modern Recording Techniques*.

Eddie Ciletti
Contributing Editor
Manhattan Sound Technicians
NYC, NY

in sync. Everything works perfectly, except we can not get the E-mu Darwin to start recording when triggered by either the Mac or the Roland A90 (which is the master controller triggering Finale to begin to play).

We have called E-mu and it seems Darwin will only start on command using MIDI Machine Control. Since neither the Roland A90, JV1080, or the Mac sends out MIDI Machine Control, how do we sync our multitrack recordings?

George D. Anderson
via Internet

A The Darwin hard-disk recorder responds to locate commands and transport commands via MMC (MIDI Machine Control) and outputs MIDI timecode. Most computer-based MIDI sequencers, including Vision, Performer, E-Magic, Cubase, and Cakewalk, output MMC and will synchronize to MTC. By connecting Darwin's MIDI In and Out ports to your computer's MIDI interface, you can locate, arm tracks, and even punch in and out Darwin from your sequencer. Darwin must be defined as an MMC device in the sequencer's setup, and different sequencers have different methods of doing this. Be sure that the Darwin is set to the same MMC ID# as what you've set up in the sequencer; this is adjusted in the MIDI set up page, under the system menu in Darwin.

You may want to note that while Finale is a powerful notation program, it is pretty limited as a sequencer. If sequencing is a major part of your production process, you might want to consider using a more suitable program, like the ones mentioned above, and transfer them to Finale for notation purposes.

Matt Ward
Director of Marketing
Audio Products
E-mu Systems

ASK US

Send your queries to:

EQ Editorial Offices,
939 Port Washington Blvd.,
Port Washington, NY 11050
Fax: 516-767-1745

SURVIVAL OF THE FITTEST

Q We need help. We have a Roland A90EX and JV1080, a Mac Quadra 840 AV with Finale 3.5.1, connected with an Opcode Studio 4, and a new E-mu Darwin hard-disk recorder. We want to do multitrack recording and get them

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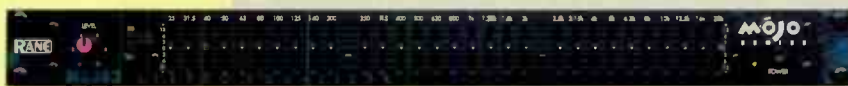


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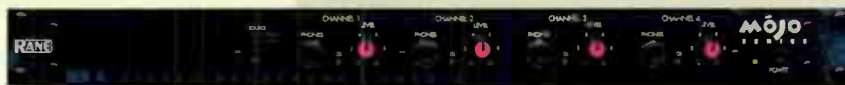


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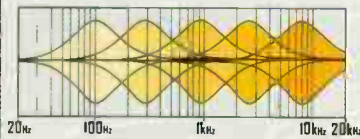


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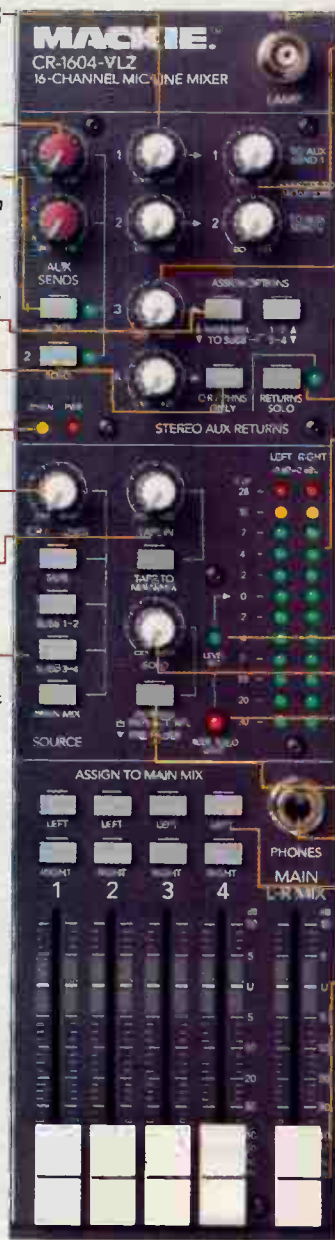
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performers in the studio hear what you're hearing in the control room), run simultaneous broadcast or live 2-track recording mixes, monitor 2-track tape deck output (if you're doing commercial production, press TAPE and share it

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***THE BIG ASTERISK:** Suggested U.S. retail for the CR1604-VLZ is \$1199. This is actually LESS than the combined price of the old CR-1604 and XLR10 mic preamp expander (needed to get a full 16 mic preamps). Priced higher in Canada.



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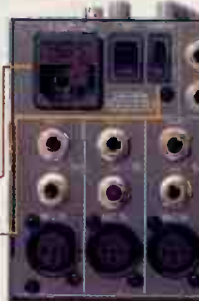
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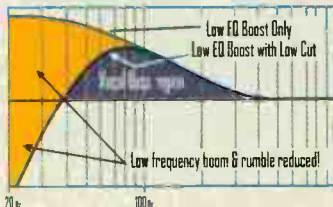
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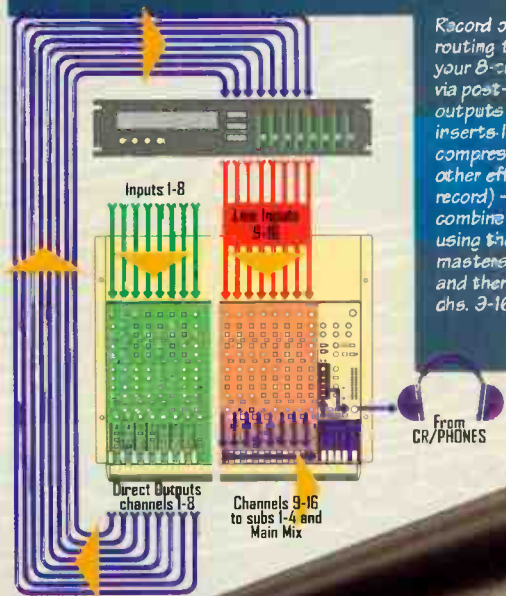
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GET ON TRAC

Soundtracs recently introduced a new range of Topaz mixing consoles. The new rack-mountable Topaz 12-4 features 3-band EQ, two aux sends, four mono mic/line inputs, and an additional two stereo FX returns to make a total of 16 inputs available for mixing. All the inputs have solo and mute and can be routed to a stereo bus with output fader control, or to the LR mix bus. The Topaz 12-4 has a suggested retail price of \$449. The Topaz 14-4 has all the features of the Topaz 12-4 plus ten premium phantom-powered mic preamps with 3-band EQ, two aux sends, and a solo, mute, group assign, and fader. The two stereo inputs and two stereo effects returns make the Topaz 14-4 equally at home in live sound, recording, and fixed installations. The Topaz 14-4 has a suggested retail price of \$599. The Topaz 24-4 provides all the features of the 14-4, with the addition of ten more ultra-low distortion mic preamps. The 24-4 also features four main mix busses, solo and mute functions, switchable pre/post on aux 1, XLR balanced mix outputs, and a total of 28 inputs to mix, including the two stereo effects returns. The Topaz 24-4 has a suggested retail price of \$1099. For more details, contact Korg USA, 316 South Service Road, Melville, NY 11747. Tel: 516-333-9100. Circle EQ free lit. #102.

PEAK YOUR INTEREST

Summit Audio's MPC-100A mic preamp/comp-limiter is a single-channel unit that features a tube preamplifier section followed by a separate tube compressor/limiter section. The MPC-100A offers microphone, Hi-Z (for musical instruments), or line inputs preamplified by the first vacuum stage. A switchable front-panel VU meter accurately reads input, output, and gain reduction. The MPC-100A also offers an input pad, which is a stepped attenuator and clip indicator with support for both XLR and 1/4-inch jacks. Suggested retail price is \$2400. For more details, contact Summit Audio Inc., P.O. Box 1678, Los Gatos, CA 95031. Tel: 408-464-2448. Circle EQ free lit. #103.



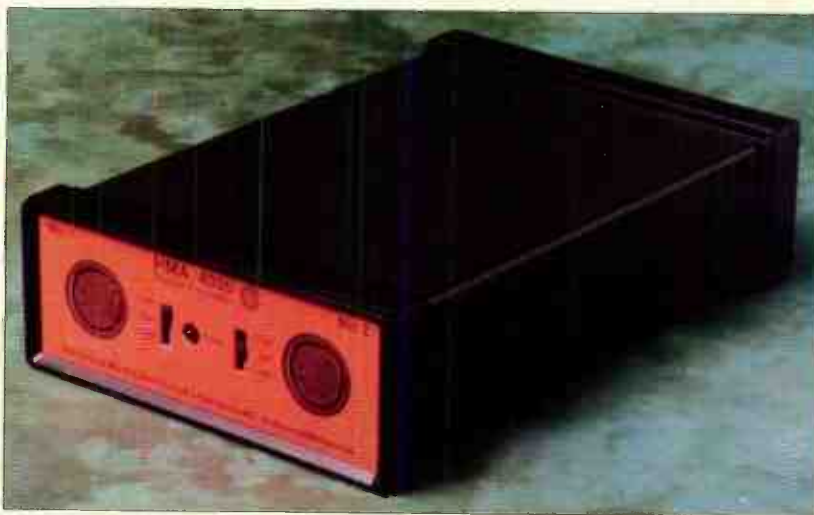


TALE O' THE TAPE

Encased in a unique shell that incorporates a three-piece design molded from ultra-rigid materials, BASF Magnetics' Reference Maxima TPII analog reference cassettes have been designed to meet the needs of professional recording studios and production houses. A special control element and newly developed azimuth pins help to minimize high-frequency losses due to azimuth errors. The tape consists of a ferro-cobalt formulation that provides for better recording level headroom with minimum distortion. The super smooth back coating reduces modulation noise. BASF Reference Maxima tapes come in lengths designed for studio use including C-10, C-20, C-60, and C-100. In addition, the hubs are specially marked to make in-cassette editing or cueing easier. For more information, contact BASF Magnetics, 9 Oak Park Drive, Bedford, MA 01730-1471. Tel: 617-271-4000. Circle EQ free lit. #104.

STRAIGHT FROM THE SOURCE

Bruel & Kjaer has introduced the HMA 4000 dual-channel, 130-volt power supply for 4003/4004 and 4012 microphones. The HMA 4000 features both electronically balanced and single-ended line-level outputs. The 130 volts delivered to the microphones' built-in amplifiers gives them enhanced SPL handling capabilities and increases preamplifier headroom by 10 dB. Input signal in either channel can be independently amplified or attenuated by +20 dB, 0 dB, or -12 dB with channel separation of up to 90 dB. The HMA 4000's operational amplifiers achieve very low self noise and have a dynamic range of up to 140 dB with a frequency range of 10 Hz-200 kHz (± 0.5 dB). For added versatility, the HMA 4000's impedance converter can drive up to 300 meters of line-level cable, so you can use the amplifier as a line driver in fixed installations or for live applications. For more details, contact Bruel & Kjaer/TGI North America Inc., 300 Gage Ave., #1 Kitchner, ON N2M 2C8. Tel: 519-745-1158. Circle EQ free lit. #105.



MEDIA'S MESSAGE

The HV-3C mic preamp from Millenia Media features an integrated Apogee 20-bit A/D converter that employs the Apogee UV-22 process. Optionally, the Millenia HV-3C reads and writes 20 bits directly to two combined tracks of ADAT or DA-88

and accepts any external 20-bit digital audio for stand-alone UV-22 processing. The HV-3C locks to master clocks, including AES, S/PDIF, and word clock. The HV-3C also employs Millenia's HV-3 high voltage microphone preamps and buffered line inputs. The mic preamps and A/D converters may be used independently, while the analog or digital insert point can also be realized between preamp and converter. The HV-3C mic preamp has a suggested retail price of \$2995. For further information, contact Millenia Media, Inc., 9624-C Kiefer Blvd., Sacramento, CA 95827. Tel: 916-363-1096. Circle EQ free lit. #106.

EQ AES PREVIEW

GRACE UNDER PRESSURE

The Model 201 2-channel microphone preamplifier from Grace Design is based on its flagship Model 801. Each channel is equipped with phantom power, phase reversal, and a 20-dB attenuator. The gain controls are 24-position gold contact switches accompanied by a 10-dB output attenuator knob. Like the Model 801, the Model 201 is designed to deliver clarity, subtlety, and detail to tape or hard disk with no coloration. For more details, contact Grace Design, P.O. Box 204, Boulder, CO 80306-0204. Tel: 303-443-7454. Contact EQ free lit. #107.



REV ON

Yamaha's REV500 offers more power using the first application of the Yamaha 3rd generation DSP chip. This same DSP chip is also used in the high-end ProR3 reverberation unit and in the mixing functions of the Yamaha 02R digital console. The REV500 features 20-bit A/D-D/A converters for high dynamic range and extremely low noise, built-in sound source for snare



drum, cross stick, and pulse, enabling reverb parameters to be set without an external source. The MSRP is approximately \$500. For more details, contact Yamaha Corporation of America, Professional Audio Products, 6600 Orangethorpe Avenue, Buena Park, CA 90622-660. Tel: 714-522-9011. E-mail: Info@yamaha.com; Web: www.yamaha.com. Circle EQ free lit. #108.

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104: Bigger, deeper, fuller bass. Extended, natural highs and greater presence. Get more sound from your system without increasing peaks. Individual tracks or an entire mix will "jump" from the speakers.

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106: Invisible. This automatic compressor is so transparent that some people think it isn't working! Effortlessly maintain perfect levels without having to constantly adjust ratio, attack, release and threshold.

107: The award winning, #1 selling Tubessence mic preamp is the perfect marriage of solid state and vacuum tube circuitry. Upgrade the sound of all your mics with uncolored detail, presence and warmth.

These products are covered by one or more of the following U.S. Patent numbers: 4150253, 5359665, 5334947, 5450034, 5424488, 5483600.

IN SYNC

HHB Communication's new PORTADAT, the PDR1000TC/Master Sync, provides accurate jam sync'ing with timecode film cameras, ensuring that the drift will not be more than one frame in ten hours. The PDR1000TC/Master Sync also gives the user the ability to pull up at 29.97 fps drop to 30 fps drop via a single switch, and it is fully compatible with Aaton cameras via standard LEMO sockets. LEDs indicate the operational status of the 30 fps drop. Suggested retail price is \$7495. For more information, contact HHB Communications Inc., 43 Deerfield Road, Portland, ME 04101-1805. Tel: 207-773-2424. Circle EQ free lit. #109.



THE BIG SQUEEZE

Aphex Systems' Model 661 tube compressor/limiter, is a single-channel compressor/limiter that provides three compression curves (hard knee, soft knee, and no knee). The Model 661 also features Aphex's exclusive, patented Tubessence tube circuitry that utilizes a 12AT7 to provide a "tube sound." The 661 also features the patented High Frequency Expander (HFX),



the selectable Spectral Bass Refractor (SPR), and selectable link modes that include stereo link, master/slave link, and unlink. Nominal operating level is switchable, -10 dB or +4 dB, with a bargraph output level meter on the front panel. For more details, contact Aphex Systems, 11068 Randall St., Sun Valley, CA 91352. Tel: 818-767-2929. Circle EQ free lit. #110.

...at a price you won't believe

~~\$595~~
NOW
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107 Aphex Tubessence Mic PreAmp - 2 channel

~~\$495~~
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109 Aphex Tubessence Parametric Equalizer

NOW
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105 Aphex Logic Assist™ - 4 Channel Gate

Is there really a tube in there?

When Tubessence® was first introduced with the Model 107, some people had trouble believing that it was a real tube gain stage. Skeptics say, 'It's a tube simulator', or 'It's a starved-plate amplifier', or 'The tube's not in the audio path'.

The "Reflected Plate Amplifier" (US Patent #5450034) is a true vacuum tube circuit which has the desired characteristics without the heat, weight, fragility, sonic variability, short life and high frequency roll-off of conventional tube designs.

108: The Wave Dependent Compressor simultaneously controls average and peak levels for the hottest tracks possible without the artifacts of other compressors. Finally, an "intelligent" compressor that sounds better.

109: Got enough EQ? Two channels of fully parametric, two band, tube EQ, great for mastering or touch up. Track needs major work? Hit a switch and it's a mono four band. Unparalleled sound and flexibility.

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Foreign patents issued or pending. Aphex, Aural Exciter, Big Bottom, Logic Assist and Tubessence are trademarks of Aphex Systems Ltd.

CIRCLE 04 ON FREE INFO CARD
World Radio History

EQ AES PREVIEW

FROM THE REFERENCE SECTION

Utilizing a newly developed 6.5-inch injection-molded low-frequency transducer and a 3/4-inch fluid-cooled material dome tweeter, Tannoy's SBM studio reference loudspeaker has been designed specifically for the project studio maven. The new system features a front-loaded slot port delivering linear extended low frequency down to 45 Hz without the bloating often found in other designs. For further information, contact Tannoy/TGI North America Inc., 300 Gage Ave., #1, Kitchner, ON Canada N2M 2C8. Tel: 519-745-1158. Circle EQ free lit. #111.



RACK YOUR BRAIN

Constructed of a high-density particle board with a fused, melamine surface, RAXXESS Metalsmiths' Elite Series racks are available in two finishes — black fleck and mahogany. All edges are trimmed with solid hardwood for a rich, attractive finish. Shipped disassembled, Elite Series racks can be put together in just a few minutes with a simple screwdriver. RAXXESS's Elite Series racks are available in 4-, 8-, 12-, 16-, 20-, and 24-space models with straight fronts and in 16-, 20-, and 24-space rack models with slanted fronts. For further information, contact RAXXESS Metalsmiths, 261 Buffalo Avenue, Patterson, NJ 07503. Tel: 201-525-5105. Circle EQ free lit. #112.

BACK TO THE FUTURE

The MD421 II cardioid dynamic microphone from Sennheiser incorporates all of the classic characteristics of the original 421 while offering several improvements. The MD421 II combines advanced materials and modern manufacturing techniques, making it a more rugged microphone that is less sensitive to dust and humidity. The mic's five-position bass rolloff switch makes it ideal for most applications ranging from on-air broadcasting to vocal recording and instrument miking. The MD421 II utilizes a pressure-gradient dynamic transducer with a cardioid pick-up pattern and offers a frequency response of 30 Hz–17 kHz as well as a 175 dB SPL rating. For more details, contact Sennheiser, P.O. Box 987, Old Lyme, CT 06371. Tel: 203-434-9190. Circle EQ free lit. #113.



REAL BOSS, MAN

Designed to be the ultimate floor-type multiple effects unit, Roland's BOSS GT-5 incorporates Roland's COSM (Composite Object Sound Modeling) technology into its architecture for creating a variety of computer-generated amplifier "models" as well as a slew of cutting-edge guitar effects. Roland's Harmonic Restructure Modeling (HRM) provides many new synth-like sounds with guitar-based dynamics, while 28 other effects — including chorus, tap tempo delay, reverb, as well as harmonist and a "humanizer" feature — and an acoustic guitar simulator make it a practical unit. The fully MIDI-compatible GT-5 is housed in a rugged metal casing and features a rotary encoder for quick editing, a built-in expression pedal, a built-in tuner, and 150 presets and 100 user patches. For further information, contact Roland Corporation U.S., 7200 Dominion Circle, Los Angeles, CA 90040-3696. Tel: 213-685-5141. Circle EQ free lit. #114.



RADAR VIEW™ Highlights

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RADAR's Point of View

Replacing your analog 24 track can be a tough decision. All these formats, multiple units, synchronization and computers with mice. We at Otari feel that we have a far more simple solution. The RADAR with RADAR VIEW™.

The RADAR acts just like your multitrack. Punch in and punch out, no scrolling through menus. Just hit play or record on its familiar feeling, dedicated remote. You won't even know you are using a hard disk recorder, unless of course, you want to edit. Even then the RADAR is a pleasure to use. And the RADAR VIEW screen gives you all the information you need to know about your session, in large, easy to read graphics.

We invite you to contact your local RADAR dealer or call us, at Otari, for a free demonstration video. *We're certain you'll see things our way.*

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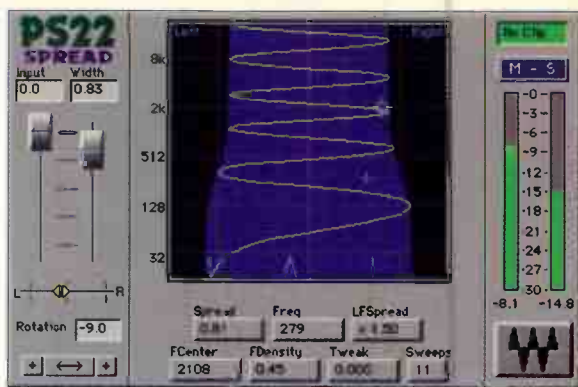
CIRCLE 59 ON FREE INFO CARD
World Radio History

EQ STUDIO WARE

MAKING WAVES

Waves Ltd. has announced the addition of the PS22-StereoMaker to their family of Waves processing plug-ins for the Digidesign TDM/SD II system. PS22-StereoMaker creates a wide stereo image from mono sources and also enhances the spread of stereo sources.

It can be used on single tracks of a mix, such as lead instruments or backing vocals, or for stereo enhancement of full mixes or old recordings. The PS22-StereoMaker plug-in is now available at a suggested retail price of \$1169. It's also available at a special price of \$919 to registered owners of Waves S1 plug-in until November 30th, 1996. For further information, contact Waves, 6716 Central Ave., Ste. 8, Knoxville, TN 37912. Tel: 423-689-5395. Circle EQ free lit. #115.



TOOLS TIME

Apogee Electronics Corporation has released a new PCI-compatible version of its popular MasterTools TDM plug-in for Digidesign's Pro Tools. The new version runs under PCI versions of Pro Tools on PCI-based machines as well as NuBus configurations. MasterTools brings an array of mastering tools to the TDM environment, including Apogee's award-winning UV-22 mastering process for capturing maximum detail in 16-bit signals. In addition, DC offset removal, channel muting and reversal options are also available. The MasterTools 3D metering system indicates peak and average level, "overs," and DC offsets, with a unique history feature that shows peak levels and phase over time. A full-featured time-limited copy of the latest version of MasterTools can be downloaded from the Apogee Web Site (www.apogeedigital.com). Retail price is \$795. For more details, contact Apogee Electronics Corporation, 3145 Donald Douglas Loop South, Santa Monica, CA 90405. Tel: 310-915-1000. Circle EQ free lit. #116.

PUT IT ON THE CARD

Antex Electronics has introduced StudioCard, the first PCI-based digital audio adapter with four tracks of studio-quality, 16-bit sound, and real-time digital mixing capability. The Antex StudioCard is a 32-bit memory-mapped board that delivers less than 0.003 percent total harmonic distortion and a 92 dB dynamic range. The StudioCard boasts high-quality components, including: a programmable 32-bit 40 MHz DSP and pro-quality connectors such as four independent balanced I/Os (+4 dBu or -10 dBv) and AES/EBU or S/PDIF digital I/O. StudioCard also offers a standard MIDI port. Multiple adapter capability, unique to StudioCard's design, allows the user to install multiple StudioCards in a single computer for up to 16-track recording. StudioCard is plug-and-play compatible and includes drivers for Windows NT. For more information, contact Antex Electronics Corporation, 16100 S. Figueroa St., Gardena, CA 90248. Tel: 310-532-3092. Circle EQ free lit. #117.



WHAT A VIEW

Akai Digital's SuperView SVGA interface and V2.0 upgrade for the DR8 and DR16 operating systems provides a comprehensive display and enhanced operation of both of hard-disk recorders. By installing a SuperView SVGA board, the user can connect a standard SVGA monitor along with a computer keyboard directly to the DR8/DR16 to provide an intuitive user interface, however, no computer is required. The SuperView display provides a detailed waveform with zoom in/out capabilities and the keyboard also allows you to name your tracks, takes, and clips. All transport functions, as well as edit functions such as cut, copy, paste, and undo, can be controlled remotely from the keyboard. The V2.0 upgrade provides support for the SuperView interface plus other enhancements to increase the functionality of the DR8 and DR16. The SuperView upgrade board is available with an MSRP of \$699, and the DR8/DR16 V2.0 System Upgrade is available at an MSRP of \$39.95. For more information, contact Akai Digital/IMC, 1316 E. Lancaster, Ft. Worth, TX 76102. Tel: 817-336-5114. Circle EQ free lit. #118.

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World Radio History



The 168RC is the first truly affordable, fully digital, 8 bus recording console. Use it with your ADAT or other digital recorder equipped with the ADAT optical interface to create the best sounding recordings you've ever made.

168RC Digital Recording Console

The heart of a new, component-based Digital Recording System from SoundLink

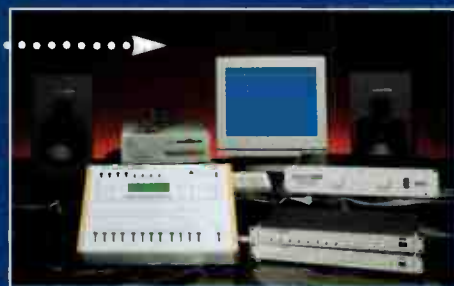
The 168RC is the first

digital console to feature two ADAT optical interfaces (yielding 16 channels of digital input) and eight analog inputs as standard equipment. It makes the creative control and sound quality of an all digital, fully automated recording system an affordable reality.

Powered by Korg's proprietary MSP processor, our SoundLink DRS 168RC offers instantaneous control, processing and routing of all 24 inputs, 16 channels of mixing and 8 bus outputs.

With its combination of analog, ADAT optical and S/PDIF I/Os, the 168RC easily functions as the heart of a fully digital recording system while interfacing with any of your existing analog gear.

The 168RC is equipped with three-band EQs



SoundLink DRS brings the reality of all digital, fully automated, component based recording to everyone working on the next great recording. For more information about the 168RC Recording Console or any of the SoundLink DRS components, just call (516) 333-8737.

featuring semi-parametric high and low bands, fully parametric mid bands and 30 memories for EQ setups.

The 168RC also boasts two internal effects processors that run some of the finest algorithms available. Choose from 32 effects types and 50 preset programs.

The 168RC even provides automation functionality that lets you save and recall console settings or record and playback dynamic parameter changes.

Affordable, fully integrated digital recording is finally here. So check out SoundLink DRS and the 168RC today. You can't beat this system.

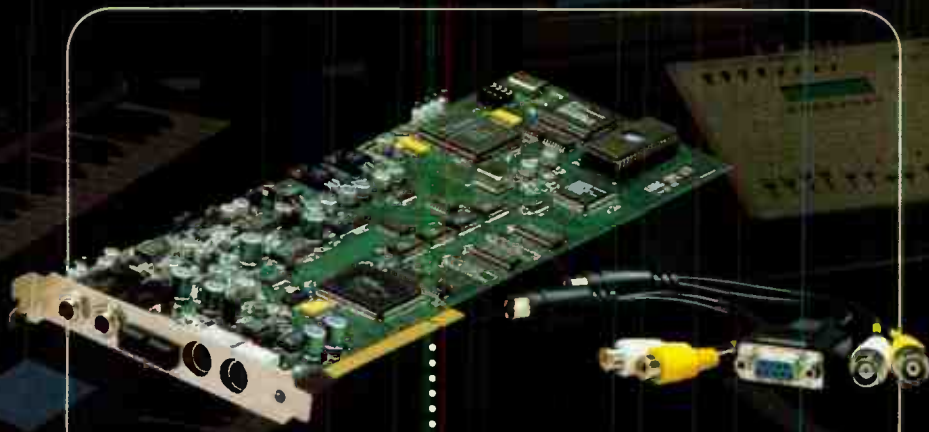
SoundLink DRS
Digital Recording Systems

*Affordable, fully integrated digital recording
Down to a System.*



SoundLink DRS 1212 I/O Multi-Channel Audio Interface

The SoundLink DRS 1212 I/O, along with Deck II software, brings the price of full-function, multi-channel computer based recording to a point that just about anyone can afford. And since the 1212 I/O conforms to the new PCI format, your investment will last longer than just a few months!



With the power of advanced personal computers, full-function multi-channel recording and editing is possible without the addition of costly, specialized hardware. The only true limitation has been in the area of multi-channel I/O. With the introduction of the SoundLink DRS 1212 I/O Multi-Channel Audio Interface, that limitation no longer exists.

The 1212 I/O features 12 inputs and 12 outputs configured as two analog I/Os, an S/PDIF I/O and an eight channel ADAT optical I/O. All the I/Os can be used simultaneously. For even more control and flexibility, the 1212 I/O connects to Korg's 168RC Recording Console, or to the Korg 880A/D and 880D/A interfaces.

The new 1212 I/O even offers a Word Clock input and output, plus an ADAT time code input, for system synchronization. Between the 1212 I/O with Deck II



168RC Recording Console, the heart of the SoundLink Digital Recording System.

For more information about SoundLink DRS components, call (516) 333-8737.

software, the 168RC Recording Console, an ADAT and a Trinity Music Workstation DRS, the combinations and configurations can meet the needs of just about any music production application.

All of the devices will interface with your existing analog equipment and form the basis for a completely digital system that will give you sound and creative control that simply isn't possible in the analog world.

Affordable, fully integrated digital recording
Down to a System.

SoundLink DRS
Digital Recording Systems

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KORG

World Radio History

VOCAL



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INSTRUMENT/
VOCAL



SHURE
BETA 57A

VOCAL



SHURE
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If you're miking an entire stage, you'll want the full Shure Beta Line. It includes the improved Beta 57A and 58A with smoother response and lower handling noise.

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World Radio History

Woo and Improved

Billy Ray Cyrus leaves
a *Trail of Tears* at
this project studio

STUDIO NAME: Screaming Woo Music

LOCATION: Kingston Springs, TN

KEY PEOPLE: Terry Shelton (engineer, owner); Mike Segraves (assistant engineer on Billy Ray Cyrus project); Melinda Shelton (client assistant)

PROJECTS RECORDED: Billy Ray Cyrus *Trail of Tears*; currently recording Don Von Tress (a.k.a. the "Achy Breaky Heart" man) debut solo album; vocal segments on Billy Ray Cyrus's *Storm in the Heartland* album; numerous custom projects

CONSOLE: Mackie 32•8 with Mackie Ultramix automation

RECORDERS: TASCAM DA-88 [3], TSR 8, and DA-30 [2]; Sony TC K615S

MICROPHONES: Audio-Technica 4050 and 4033; Sennheiser 421 [5]; Shure SM57 [6] and 58 [2]

MONITORS: Yamaha NS10

AMPLIFIERS: Crown DC 300; Sony D590

COMPUTERS AND SOFTWARE: Compaq PC running Twelve Tone Cakewalk Pro Audio for PC; Mackie Ultramix on an Opcode Systems Music Quest MIDI card

OUTBOARD GEAR: ADL tube compressors; Aphex 661 compressor; dbx 160xt [2]; ART MDC; Rocktron Intelliflex; Roland DEP 5 [2]; Eventide H3000; Lexicon LXP 15 [2]; Aphex 107 mic pre; Alesis Quadraverbs

MIDI GEAR: Roland XP 50 keyboard; Alesis DM 5; Roland GI 10; J.L.Cooper MSB REV2

STUDIO NOTES: Owner Terry Shelton states: The setup in my studio is basically audio on one side and MIDI on the other. I've got all the equipment I use to record onto tape on one side of the room, while the MIDI equipment is on the other side. I have it set up this way simply because it's convenient. It's easier than stacking all the gear together; I can roll my chair to where I need to go.

The studio is actually located in my basement, which was supposed to be a bedroom. I put up hardwood walls that are soundproofed in the control room.



WOO ARE YOU?: Engineer and owner Terry Shelton

For Billy Ray's disc, I recorded the live parts in the living room next to the studio — that's where I've got 1/4-inch thick furniture pads for sound-deadening purposes. They're actually moving blankets that you'd use for, well, moving. They make great wall pads. I

went to a tent and camping shop and had grommets installed in them, making them portable. I can hang them up and take them down as I need to.

In the middle of cutting the *Trail of Tears*, I had to rearrange the studio be-

continued on page 160

Lawson L-47 Gold Tube

A new mic that may
look familiar

MIC NAME: Lawson L-47 Gold Tube

PRICE: \$1695

TYPE OF MIC: Tube condenser

POLAR PATTERN: Cardioid

ACOUSTIC OPERATING PRINCIPLE: Pressure gradient transducer

TUBE: 6072

FREQUENCY RESPONSE: 20 Hz to 20,000 Hz

SENSITIVITY AT 1 KHZ: 17.7 millivolts @ 1 Pascal (94 dB SPL)

RATED IMPEDANCE: 150 ohms

PLATE CURRENT: 1 mA (nominal)

HEATER CURRENT: 175 milliamps

EQUIVALENT NOISE LEVEL: 20 dB SPL

MAXIMUM INPUT SPL: 127 dB SPL (1 kHz @ 3% THD)

POWER REQUIREMENTS: Regulated 6.3 volts DC and 130 volts DC via outboard power supply

DIMENSIONS: 9-3/4 inches (length) x 2-3/8 inches (diameter)

WEIGHT: Two pounds

MIC NOTES: The one-inch capsule used in the Lawson L-47 is a design based upon the M7 capsule used in those "famous German-made U 47 and M 49" microphones. But the L-47 capsule employs a three-micron diaphragm instead of the original seven-micron diaphragm; this departure was made to improve the resolution of transients and extend the high-frequency response of the mic.

Gene Lawson designed the L-47 to be a modern-day marriage between the M7 capsule and vintage vacuum tube circuitry, enabling the L-47 to simultaneously achieve classic tone and low noise. Lawson uses a low-loss tube socket with heavily gold-plated contacts and a high "grip" factor to reduce resistance and increase contact pressure.

A multipattern version — L-47MP — has a continuously variable pickup pattern and can achieve omnidirectional, cardioid, and figure-eight patterns as well as all patterns intermediate to those standard ones. Construction of the L-47 body is brass with a 24-karat gold plating.


CONTACT: Lawson, Inc., 2741 Larmon Drive, Nashville, TN 37204. Tel: 615-269-5542. Circle EQ free lit. #119. 



Photo by Edward Colver

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"A very good choice for professionals who work on a deadline and demand top performance"

—Electronic Musician

"Excellent—and user friendly—results."

—Musician

"A very powerful sequencer of MIDI data and audio that now makes hard disk recording a cakewalk"

—EQ

"The #1-Selling Music Software"

—Music and Sound Retailer, April 1996



THE WORD IS OUT.

Cakewalk Pro Audio™ is now the leading MIDI and digital audio workstation for Windows PCs. Cakewalk Pro Audio provides you with a unique balance of power, stability, and ease-of-use, letting you concentrate on *creating music*. (It's a quality you won't find in music software that is merely "ported" from the Mac platform.)

THIS NEWS JUST IN.

Cakewalk Pro Audio 5.0 is now available. It includes both a native Windows 95 version and a Windows 3.1 version on a single CD-ROM. Plus 40 new instrument definitions, improved editing functions, new MIDI+audio song files, on-screen Cakewalk tutorials, JAMMER® Hit Session™ accompaniment software, support for the Digidesign Audiomedia III™ card and Soundscape SSHDR1™ hard disk recorder, and more.

And, oh yes— *still* no copy protection. Unlike some software manufacturers, we don't treat our customers like suspected criminals.

SO SPREAD THE NEWS.

If you need integrated MIDI and digital audio recording, rock-solid SMPTE synchronization, and high-quality notation, then ask for the industry leader—Cakewalk Pro Audio.

Did we mention affordability? Cakewalk Pro Audio is only \$399. (Deluxe edition \$479; includes Musician's Toolbox CD-ROM.) For the name of a Cakewalk dealer near you, call **800-234-1171**, or fax **617-924-6657**



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World Radio History

Man Sues International Manufacturer: False Advertising!

Harvey Rubinesky, of Climax, Ga. filed suit with a large professional audio manufacturer for false advertising. He contends that the Yamaha ProMix 01 was advertised as a "smart" mixer, but, in reality, it can't answer even the simplest question! "For example, the ProMix 01 does not even know the capital of New Jersey", stated Harvey! Rubinesky freely admitted that one might be "smart" and not know the capital of New Jersey. "However", continued Harvey, "how about an opinion? When I ask the ProMix for its favorite color it just sits there!"

Yamaha, when asked to comment, pointed out the ProMix was extremely smart when compared to other mixers.

It is Yamaha's position that no audio mixer knows state's capitals or can offer an opinion of any kind. Where the ProMix is really smart is in the area of MEMORY - this mixer remembers every setting of all 18 input channels. This means at the touch of a button you can store and instantly recall the position of faders, mutes, aux sends, pan pots, eq, at any time, to allow you to return precisely to a previous mix. When connected to a MIDI sequencer or data recorder, real-time moves (such as actual movement of faders, pan, eq and aux send controls) can also be stored and replayed with precision. With 20 bit A/D converters, 3-band true parametric eq on every

channel, and 3 internal compressor/limiter/gates, sonically the ProMix 01 is a giant - and has performed impeccably on top film scoring sessions, classical recordings, in high-end professional sound reinforcement and broadcast applications. As a digital mixer, the ProMix can connect directly to digital recorders like RDATE and other devices, keeping signals in the digital realm. At a suggested price of \$2,199 the ProMix 01 competes with the finest mixers, replaces a ton of outboard gear and allows you to get back to your favorite settings in a snap.

Rubinesky was asked for comment after hearing Yamaha's response. Harvey maintained that having a good memory did not necessarily make one smart. When we asked Rubinesky what the capital of New Jersey was, he said he couldn't remember.



ProMix 01

FOR MORE INFORMATION ABOUT ANY OF THE PRODUCTS SHOWN IN THIS ISSUE PLEASE Call (800) 291-4214 ext. 830 or visit us at www.yamaha.com.

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Surfing Tragedy

Reeve O'Neal, a popular local surfer, was sucked into the falls and knocked flat by the laptop on his longboard.

Friends report that O'Neal had wanted to surf to the new Yamaha guitar internet site,

www.yamaha-guitars.com, which features a complete guitar "catalog," artist information, news and cutting edge graphics.

Yamaha is dedicating the site to Reeve. "He was a cool dude and he had guts, but he wasn't very bright" remembered a close friend.

P50-M Piano Tone Generator



Evil Spirits Inhabit New Yamaha PianoTone Generator

Beelzebub. Mephisto. Satan. Gossip says Yamaha must be selling out to this dark source—how else could it take over 100 years of keyboard manufacturing and shrink it into an 8 inch box.

Yamaha sources say their P50-m piano tone generator is simply a matter of advanced electronics and acoustic piano know-how. But who believes those corporate types anyway.

No, this reporter is witness to some peculiar activity outside the Yamaha plant late at night. Deep, evil laughs have accompanied frenzied piano solos emitting from the Yamaha R&D lab. While Yamaha claims that it has compressed over 11MB of wave ROM into 6MB of space and added 3-band EQ and 40 types of effects, this newspaper has evidence suggesting that by using the P50-m's simple panel switches, you are actually awakening the undead who would just as soon steal your soul as play your music.

Gorilla Musicians Get Mega Record Deal

Record execs from the newly formed Banana Records last week gave a family of gorillas a \$10 million recording contract after hearing their demo, "Unga Rap." Gerry O'Shaunessy, director of Banana Records says: "These primates are GOOD! We are sending our best talent scout to Rwanda to find more musical apes."

Anders Olygok, an anthropologist, discovered the family's talent purely by accident. "I came to study the gorilla's mating habits. I brought some musical gear to help soothe the animals and record their mating sounds—the Yamaha SU10 hand-held sampler and CBX-K1XG controller keyboard/tone generator. Between the two I have an entire MIDI studio powerfully at my disposal. One night I awoke to this bizarre music. This family of six gorillas had gotten hold of the gear and the Silverback, the family patriarch, was crooning away."

Olygok's companion, Olga Nsygd, observed the mother gorilla working the SU10 sampler. "She took to it like a fish to water. After all, it's very easy to use. She gathered about 30 samples of the Silverback—the SU10 lets you record and replay up to 48 in stereo—and then she used the ribbon controller to scratch out all kinds of wild effects."

Nsygd and Olygok then witnessed the gorilla editing the sounds by changing the playback direction, loop type and loop points. She also utilized the scale function to play samples at incremental pitches. Banana Records mega-producer Tony Romono said, "She's a born musician. Her mastery of this device is incredible."

Romono was also impressed with the youngest member of the family, Chip. "He's quite adept at the CBX-K1XG keyboard. And he loves to explore the CBX-K1XG's 727 XG and GM voices and 11 drum kits. He has no preconceived notions of what music should be. But the drums are especially prominent in his music."

At Banana Studios, Chip demonstrated his talents for the Inquisitioner using the CBX-K1XG's built-in stereo speakers. Happy with his performance, he then saved it to disk via MIDI bulk dump using his Yamaha MDF2 MIDI data file, much as his mother did in the jungles of Rwanda with the SU10.

The only hitch in the arrangement so far is that Banana Records just can't seem to keep enough bananas around.

CBX-K1XG



REGULAR GUY BUYS DIGITAL MULTITRACK RECORDER!

"It cost the same as some 4-track cassette recorders!!" Guy exclaims.

It's unbelievable, but true. This reporter has uncovered evidence that regular musicians — not just cash-crusted music moguls — can now afford digital recording. Yamaha, those same crafty devils famous for their technological know-how, now brings digital to the masses. Yamaha's MD4 is the lowest cost digital multitrack recorder available anywhere. According to Regular Guy, musician, "I got my MD4 for around a thousand bucks while most digital multitracks are going for \$2400 and up!"

Eager to blow the lid off this story, we visited Guy as he recorded a demo with his band, Psychic Poodles. We verified the facts... using the MD4 4-track multitrack. Guy's audio quality was incredible (even if the Poodles don't have the best licks). With digital audio storage, there's no audible noise, 0% wow and flutter and full range frequency response. The MD4 recording was so good, it could be used as final product — not just a scratch pad — even for professional composers.

It gets even juicier. Because the MD4 is digital, the sonic performance doesn't degrade with track bouncing. And you can even bounce to the same track — you don't have to keep an open track like you do with cassette recording. And get this. You can locate an exact (and we mean exact) place in your tune easily. According to Guy, "That means you can find, hear, and re-record even a short passage without erasing any of the good stuff. If only Nixon had had this instead of tapes."

Still, we were skeptical. What was the secret of the MD4? Our inquiring minds found out when Guy popped a MiniDisc out of the MD4. That explains why he could record for 37 minutes per track instead of the 22 maximum that's normal with cassettes. Those MiniDiscs are small and portable, but then again, so is the entire MD4 system. After revealing his story, Guy packed up his Poodles, his MD4 and left (Cont. on Page 24)



MD4 4-Track Multitrack



"I'VE LIVED THE SAME DAY 500 TIMES"

02R

Friday seemed like a normal day to Joseph. But instead of being followed by Saturday, he woke up to Friday again, 500 times! "Every day was exactly the same. I stepped in the same puddle. I heard the same song on the radio. I left my fly open. Everything."

Scientists blamed sunspots for this bizarre occurrence but a recording engineer had a different idea. "It must be the Yamaha 02R Digital Recording Console. It saves every aspect of a mix, including EQ, fader positions and effects and recalls them precisely and instantly. I guess it's moved beyond music now." The embarrassed scientists agreed.

NATIONAL The Inquisitioner

Nobody Expects The Inquisitioner. Vol. 18 Issue 1284

CONSUMER ADVOCATE WARNS, "DON'T BUY YAMAHA RM800!"



"I went to the local dealer to buy one and was shocked by what I found!"

Getting a free pair of Yamaha NS10M Studio speakers with the purchase of a Yamaha RM800-16 or RM800-24 (free with the possible exception of the postage to return the coupon claiming the above—we know he'll read this), was more than well known consumer advocate, Ralph Rubinesky, could take. Ralph warned that consumers should be careful in considering the purchase of the Yamaha RM800 Mixing Console. Ralph admits he is suspicious by nature and that Yamaha's latest offering has got him spooked. "I have learned over the years," commented Rubinesky, "that if something seems too good to be true, it probably is."

Ralph explained, "I decided to start taping my nationally syndicated show at home. This required that I purchase a lot of gear, including a mixing console. Being a consumer advocate, I read all the reviews on various mixers and found the Yamaha RM800 to be just the value and performance I needed. In fact, it was almost too good to be true:

"Sound... is exceptional (particularly the low noise and sensitive EQ) for a board in this class." "Inexpensive, great sound, very versatile," says EQ Magazine.

"As the first eight bus recording mixer to come in under \$2,000...it offers the home studio market more features per dollar than any other mixer in its class," states Electronic Musician.

"I went to the local dealer to buy one and was shocked by what I found! I was

offered the RM800 at a great price. I said I'd take it. But the salesman insisted that I fill out a coupon to receive a pair of Yamaha NS10s, the world standard for recording monitors—a \$478.00 value—free of charge! This was after I had already agreed to buy the mixer. The salesman said that all I had to do was fill out a coupon and send it to Yamaha and they would ship the free NS10s directly to me!"

Ralph seemed clearly shaken. "Then, to put the final nail in the coffin, they offered to finance the deal, for six months, same as cash!"

When asked if he bought the Yamaha RM800, Ralph said ...

"Yes! What, are you crazy? I wanted to buy before they changed their minds, ran out, or discovered their mistake. For the smart shopper, timing is everything!"

When asked to comment, Yamaha stated that the deal was legitimate but that it was available at participating dealers only, while quantities last, and that it was a limited time offer.

"See," said Ralph. (call 1-800-291-4214 ext. 830 for your closest participating dealer).



RM800-16

Blessid Union of Souls "I Believe"

Engineer Jerry Lane discusses recording the string section for this hit tune

BY STEVE LA CERRA

EQ: What stands out in your mind about recording the strings for this song?

Jerry Lane: This was the first time I ever recorded real strings. The way the whole thing worked was that the original demo was recorded with just synthesizers and a sequenced piano. For the record, we thought we'd get a real piano and real strings. So we brought real string players in and they played along with the sequenced piano that we had from the demo.

So the piano sequence from the demo actually made it to the record...

Yes. Actually most of the parts from the demo wound up on the record.

Does that include the vocals as well?

Yes. Everybody thought we'd re-record some of the parts to make them better, but it turned out that nobody really liked the newer stuff better than the original demo. The piano is a Roland W-30 sampler piano. We tried recording a real piano, then we sampled a real piano and tried sequencing it. We even tried one of those MIDI grand pianos, but the original Roland W-30 sounded the best, so that's what went on the record.

So the string players were listening to the piano sequence while they were recording their parts. Were the string parts charted out?

C.P. (Charly) Roth — who is in the band and was also the associate producer —

did all of the string arrangements. The string arrangement that was on the demo is the same arrangement as on the record. C.P. wrote it out and played it on synthesizers for the demo. He'd play the first violin part on one track and then we'd go to the next track and do the next violin part...He had the parts written out so we just had the players to come in and perform them.

How many string players were there?

Ten altogether. Three first violins, three second violins, two violas, and two cellos. They all played together at the same time. We recorded a lot of tracks — maybe two or three passes — to double all of those parts.

So their parts were layered to fatten them up?

Yes, so it would sound more full. Then we would also do a separate pass to record the entire string section on the two room mics we had up. The parts are actually tripled.

How did you go about miking the room?

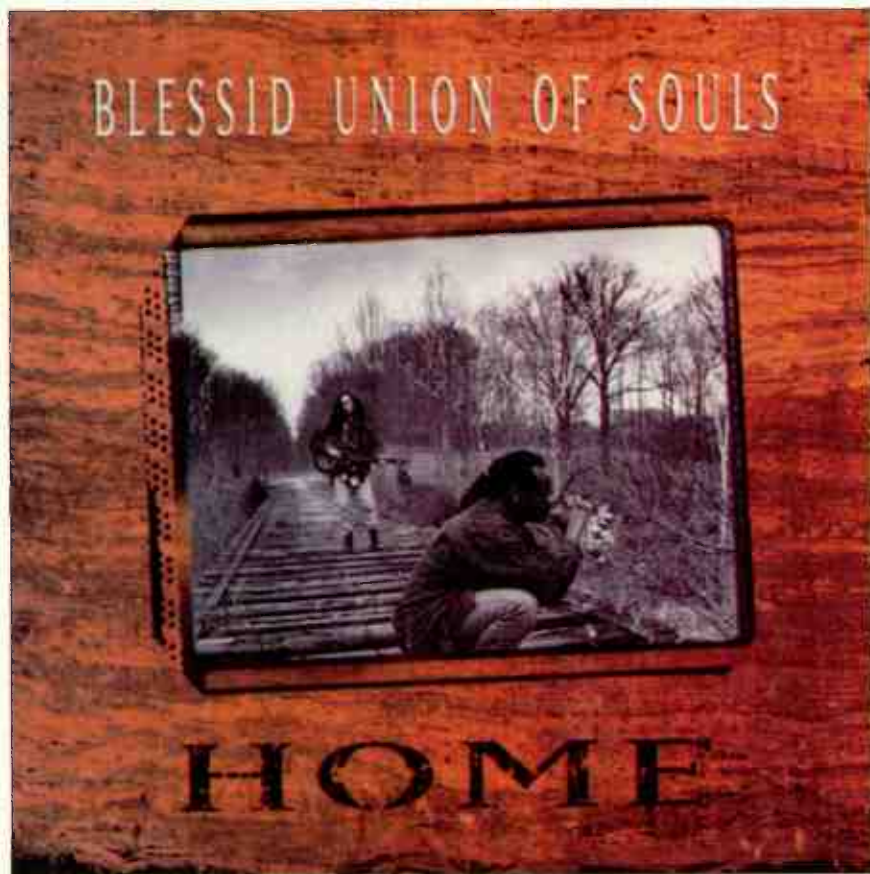
We recorded the tracks at Ligosa Sound in Cincinnati. The room that we have there is kind of a weird room. We actually just redid it, but at that time it had concrete block with slots and sound deadening material in it, like they use in factories. We rented some B&K 4006 omnidirectional mics and we had two of those up in the room. Charly was conducting and the mics were behind and right on either side of him about three or four feet apart, like a spaced pair.

What did you do for the other passes? Were the strings miked in sections?

Yes. We were using Neumann TLM 170's for the violins and violas. For the cellos we used some mics custom-made in Nashville by Gene Lawson of Lawson, Inc. He makes several different mics based on the capsule used in the Neumann U 47. There's a solid state and a tube version of the mic. The tube version is the L-47 [see this issue's *MicroPhile*] and the solid state is the L-47S.

How did you position the mics?

continued on page 140



WHERE THE HEART IS: Blessid Union's hit song is from the album *Home*.

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AES '96: Workshop Preview

Audio's show of shows is more than just products

BY STEVE LA CERRA

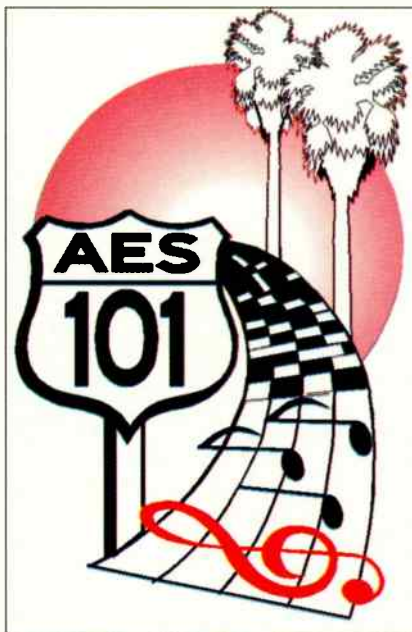
While every AES show brings the favorite of things — new gear — to our attention, even the most die-hard of gear sluts must recognize that the show is also an exchange of ideas that includes new technologies and techniques that we can apply while using all that wonderful equipment. This year's AES, taking place in L.A. from November 8–11, is no exception. It therefore makes sense to build into your AES schedule time to attend some of the show's many workshops and technical papers.

Since low-cost digital recording equipment is now a reality, the problem of synchronizing digital audio has become an everyday consideration. If you're having trouble sync'ing, swim over to workshop W-2 (November 8): "Digital Audio Sync Issues," which will explain methods for getting your 0s and 1s to happily line up. Addressing similar issues in the postproduction environment will be workshop W-15, "Audio Sweetening" (November 11). And speaking of digital audio, if you're struggling over the decision of whether to go with tape or hard disk (or both), don't miss workshop W-5 (November 9), "Multitrack Digital Recording: From 8 to 48-Track Machines." This session will discuss applications, techniques, and the strengths and weaknesses of various formats.

Chaired by Russ Berger (Russ Berger Design Group, Dallas, TX) workshop W-11, "Studio Design For The Project Studio," is a must for *EQ* readers. Discussion will include scheduling, budgeting, and design criteria for the project room. Three case studies will be presented from the perspectives of the studio owner, design team, and contractor. Once you've got that room up and running, you'll want to be recording some great sounds. Any successful engineer will tell you that it's all in your mic technique. Check out workshop W-1, "Microphones and Microphone Tech-

niques" on November 8. Featuring experts in the sound reinforcement, classical, and pop/rock areas, this session will focus on how to make intelligent decisions about your microphone selection and placement.

Those of you who are die-hard tube heads will want to catch workshop W-3, "Tube Technology" (November 8), which will explore the in's and out's of every engineer's favorite studio heater. While "Loudspeaker Technology" (W-



START PLANNING: The AES Convention is quickly approaching.

14, November 11) will focus on the latest developments in loudspeaker engineering and application, it will also offer attendees the opportunity to question industry leaders in an open exchange about the future direction of the products we are using. Loudspeaker tech heads will also want to attend Session C of the technical papers, which includes "What's Really New In Loudspeakers," to be presented by Drew Daniels of Sound Path, LTD. at session A on November 8.

Engineers particularly interested in the future of the compact disc will be most interested in several workshops. The first, "Audio For DVD" (W-4, November 8), will deal with the problems

of getting audio onto new media such as the Digital Video Disc (DVD). In addition to the audio/video synchronization issue involved with DVD, this session will also examine "total bit budget," audio compression, and techniques such as "branching," which might be new to many audio engineers.

"CD-ROM Techniques: A Software Developer's Workshop" (W-8, November 9) will explore sample-rate conversion versus audio quality, aliasing and quantization, and digital artifacts. Emphasizing the equipment and processes used to manufacture optical discs — including DVD — will be W-10 "The CD Manufacturing Process" (November 9). Chaired by David Rabideau of US Optical Disc, Inc., discussion will also include a debate of single versus double-speed (and higher) glass mastering and its effect on the audio quality of the program material.

Anyone with an interest in the mastering process (and that really should include all of us since our efforts usually go through it at some point) will want to attend workshop W-7: "A History Of Mastering." Chaired by one of the true Masters, Bernie Grundman, this session will take a comprehensive look at mastering from its humble beginnings through its present status. James A. Moorer of Sonic Solutions will present a mastering-related tech paper: "Breaking The Sound Barrier: Mastering At 96 kHz and Beyond" during Session I on November 10.

These are just some of the technical papers and workshops that are slated for the '96 AES in Los Angeles. Of course, it would be impossible to attend all of them (and even if you could, your brain might fry), but try to make time to catch some of them; your AES directories will provide the details as to where and when they'll be. Remember: the gear is great, but you've got to know how to use it. Make this year's AES a learning experience that will serve the rest of your engineering career.

For more information, contact the Audio Engineering Society, 60 East 42nd St., New York, NY 10165. Tel: 212-661-8528. Web: www.aes.org.

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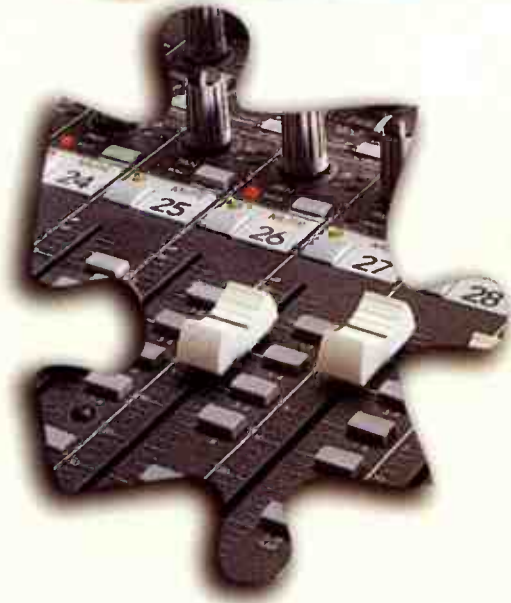
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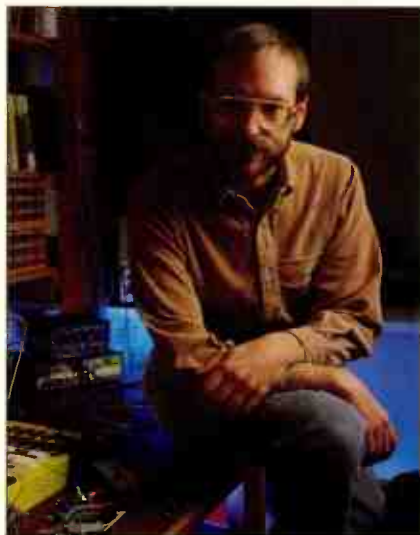
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Phix Your Phase



Weak sounds may be more than just a phase you're going through. Here's how to fix them.

BY CRAIG ANDERTON

When a drummer hits the beater on a kick drum, a rush of air pushes outward and we don't just hear it, we *feel* that "thud." In theory, if we record that kick drum and play it back, then the speaker will push air out and re-create the sound.

But what happens if somewhere along the line, the signal phase (or polarity, if you want to be more precise in your terminology; see sidebar) becomes flipped? This can happen in many ways, from a miswired XLR connector where hot and neutral are reversed, to a design flaw in a piece of gear (some products produce out-of-phase outputs), to a reversal of the wires going to your speaker.

Theoretically, the ear is not responsive to phase and doesn't hear any difference whether an output signal is in-phase or out-of-phase compared with the input. However, many people feel that

the ear *can* discriminate absolute phase with certain types of signals. This isn't too hard to believe. For example, with the kick drum example given above, it makes sense that our brain would say "something's wrong" when it hears a kick drum that sucks air away from you rather than pushes air toward you. On the other hand, with cymbals you don't hear much of a difference because the sound is more diffused anyway.

In any event, phase changes are certainly audible when mixing in-phase and out-of-phase signals together. For example, suppose two mics pick up an instrument sound with one properly phased and the second miswired so it's out-of-phase (fig. 1). As the waveform from one mic reaches maximum, the other reaches minimum, so combining the two causes cancellation that results in a thinner sound (in practice, the output usually won't be exactly the same as the input, so the signals won't cancel completely).

This is why consoles have phase switches. If you mix two in-phase signals, the result is a stronger signal. Most design engineers realize that phase consistency is important and therefore design products whose outputs are in-phase with

the inputs. Unfortunately, this was not the case with some older devices (particularly signal processors), and even today some newer devices have phase inconsistency. So how do we correct an out-of-phase signal?

With balanced lines, you can simply reverse the hot and neutral wires. With unbalanced lines, you need an electronic adapter called a phase inverter. By inserting it in the out-of-phase signal line (fig. 2), it reverses the phase again and restores everything to normal. As to how you obtain this kind of adapter, the best way is to build it yourself.

ABOUT THE CIRCUIT

Building a phase inverter is neither difficult nor time-consuming. The Phase Switcher in fig. 3 costs next to nothing, adds virtually no coloration, and ac-

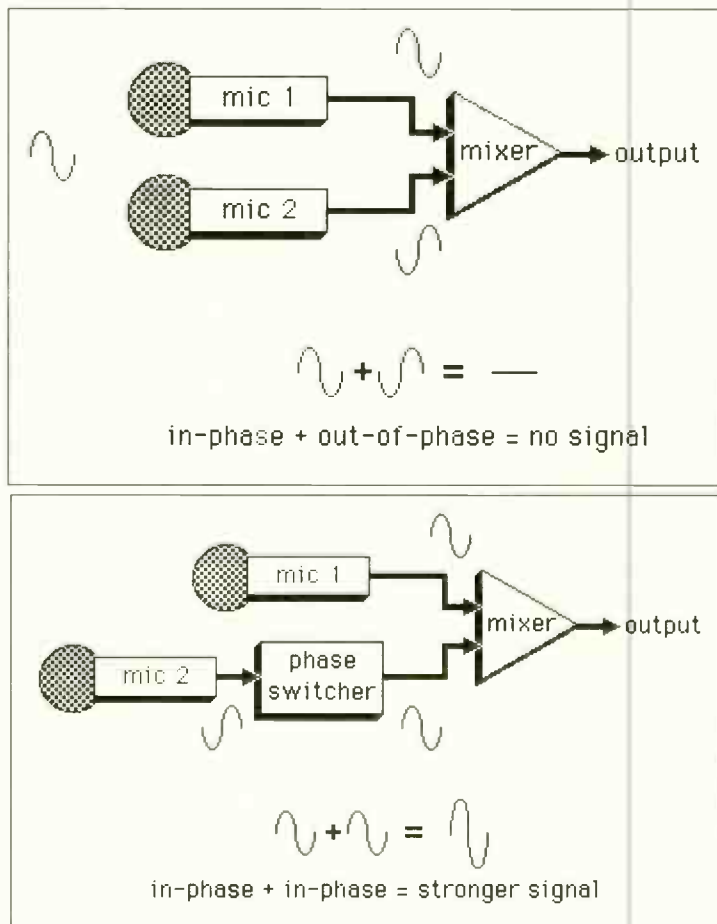


FIGURE 1 (top) and FIGURE 2



America's Fastest Growing Music Retailer

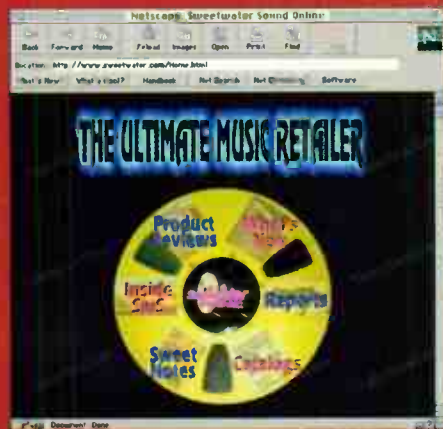
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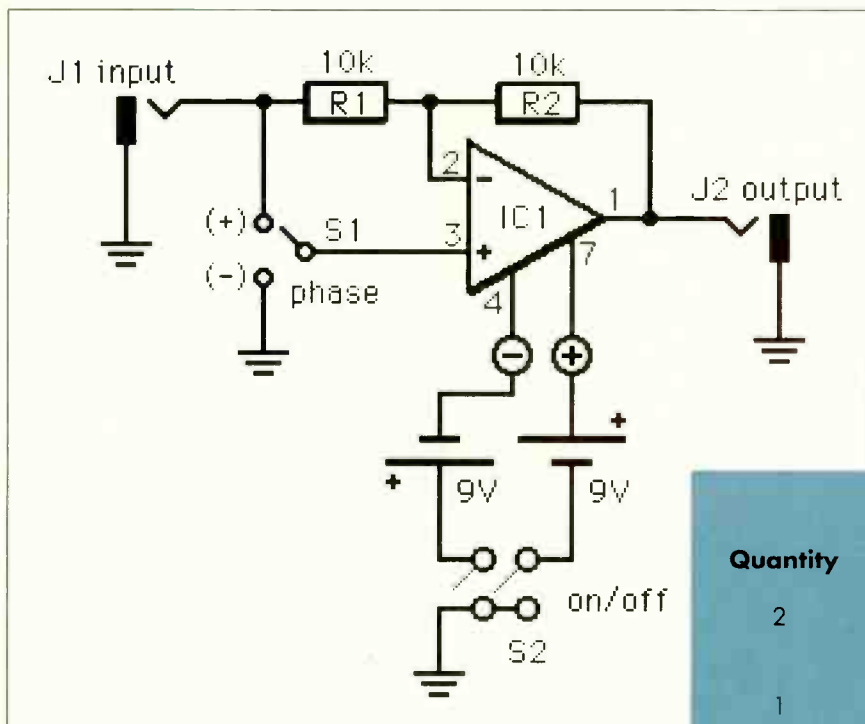


FIGURE 3

cepts -10 or +4 signals. Its frequency response goes down to DC; the upper limit depends on which op amp you choose, but typically goes up to at least 40 or 50 kHz (that should be enough).

This circuit can produce an output signal that's either in-phase or out-of-phase with respect to the input, depending on S1's setting. With S1 in the (+) position, IC1 acts like a noninverting, unity-gain buffer. In the (-) position, IC1 becomes an inverting amp with a gain of 1. There is no output level change when you switch phase.

IC1 can be any op amp that doesn't require unity-gain compensation; a lowly 741 op amp will work or, for improved performance, a TL071 or LF351. Half of a 5532 is also a good choice, although the pinout is different than shown on the schematic. Power can be provided by two batteries (the circuit draws very little current), or a bipolar DC adapter (as described in the book *Do It Yourself Projects for Guitarists*, published by Miller-Freeman). The greater the supply voltage, the greater the headroom; ±15 V to ±18 V is recommended for +4 applications. If you use an adapter, eliminate the batteries and S2. Feed the positive supply voltage to the circled +, the negative supply voltage to the circled -, and power supply

ground to ground.

USING THE PHASE SWITCHER

The Phase Switcher has many applications: reversing phase of individual effects systems, flipping mic phase with mixers that don't have phase switches (patch the switcher into the insert jacks), and repairing improperly recorded samples (like kick drums that "suck" instead of "blow"). Having everything in-phase really does make a difference in the final mix — check out this simple circuit and see if it helps make your mixes stronger and clearer.

Acknowledgment: I'd like to thank A&R veteran George Daly (and

CEO of Power Entertainment) for sharing his work regarding phase anomalies with me; our conversations are why I decided to write up this circuit for *EQ*. Incidentally, George notes that one common symptom of phase problems is that no matter how much you turn up your mixes, they never seem quite loud enough.

Craig Anderton's latest book, a from-the-ground up revision of the classic book Home Recording for Musicians, is now available. For more info, check out his AOL site (keyword SSS).

PARTS LIST

Quantity	Part
2	10k resistors, 1/4-watt, 5% or 10% tolerance
1	Internally compensated op amp (see text)
1	SPDT (single pole, double throw) switch
2	Mono, open circuit, 1/4-inch phone jacks
1	±9 to ±18V DC bipolar power supply
1	DPST or DPDT on-off switch (required for battery operation)
2	9V batteries (required for battery operation)

PHASE VS. POLARITY

It happens all the time: you're talking about phase changes to some gorgeous creature at a cocktail party, when some nerd with a pocket protector arrogantly corrects you and says that you should use the term "polarity." So what's the difference?

It's a complex topic, but here's the short answer. Polarity affects all signals regardless of frequency. What is commonly referred to as "out-of-phase" generally means flipping the polarity so that positive-going signals now go negative, and vice-versa. Phase often implies that frequency is a factor in the situation. For example, suppose you delay a signal by 0.5 ms and recombine it with the straight signal. A 1 kHz signal will be precisely out-of-phase (the period of a 1 kHz signal is 1 ms, so starting it 0.5 ms later means the two waveforms will cancel), but signals at other frequencies will be out-of-phase to a greater or lesser degree.

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World Radio History

Fat, Forty, and Back!

Photo by Neal Preston



It's been 20 years since the shock of punk, and The Sex Pistols have reformed for a tour and a live album

BY KEVIN HILTON

They couldn't quite conjure up the same hype and media attention as 20 years ago, but the reformed Sex Pistols were sure going to try. At a carefully chaotic press conference that was broadcast over the Internet, John Lydon, the former Johnny Rotten, sneered that the band was only doing it for the money. When they came to play their first UK gig on the reunion tour, the fans — and a bemused recording crew — were confronted by posters advertising the upcoming new single and album of the show, without a single note played or a reel of tape unwrapped. The Sex Pistols wouldn't have had it any other way.

The band's recorded oeuvre is not massive — one complete album (the defiantly classic *Never Mind The Bollocks*), the soundtrack to *The Great Rock & Roll Swindle*, a couple of cobbled import efforts, and a few additional singles, many of them collector's items — but it was felt that there was enough to tour with. Virgin Records decided to record a new product, but without the hassle of going into the studio and producing something new. As Lydon observes on the record, they're fat and 40, but the fans are glad that they're back — no matter how bad the advance reviews were.

The reformed Pistols is comprised of Lydon on vocals and tart comments, Steve Jones on guitar, Paul Cook on drums, and original bass player Glen Matlock, the man who actually said the "f" word on the *Today* show and was later booted out of the band in favor of the doomed Sid Vicious, who couldn't play the instrument, but at least looked the part.

LUCRE-TIVE TOUR

Armed with the songs from their first album, the Pistols kicked off their world tour at a beer festival in Finland. Nobody except the press seemed to take much notice, but this didn't daunt Lydon: "We're the Pistols, nobody likes us and we don't care," he warbled in between songs. The gigs continued with more outdoor shows in Munich, Germany, and Finsbury Park, London (fittingly, the area where Lydon was brought up), followed by an indoor show at the Paris Zenith.

These last three concerts were recorded as the basis for a live album. The aptly titled *Filthy Lucre Live* was released during July to almost universal acclaim and is a record of the Finsbury Park concert only; the intention

is to release an alternative version at a later date featuring recordings from the Zenith show. *Filthy Lucre Live* shares an almost exact track listing (plus a cover version) with the now re-issued *Never Mind The Bollocks*. Like its 1976 equivalent, the new album was produced by Chris Thomas (who, unfortunately, proved unavailable for comment), who has re-created the raw, spare, aggressive sound that spat in the face of the record-buying public 20 years ago.



DECISIONS, DECISIONS: The Sex Pistols' SADiE EDL.

The single, "Pretty Vacant," preceded it, coming into the record shops only a few weeks after the London show.



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Both the Finsbury Park and Munich concerts were recorded on digital Sony multitrack to accommodate the length of the performances, which ran to one and a half hours. This running time was achieved despite their relatively small back catalog and comprised the whole of *Never Mind The Bollocks* plus a suitably punked-up version of the Boyce-Hart Brill Building semi-classic "(I'm Not Your) Stepping Stone," a hit the first time around for another management-created band, The Monkees.

The German gig was recorded in the Dirks Mobile, but Thomas and the band decided not to use the tapes, mainly due to the show being washed out by bad weather. Explaining the reasoning behind the decision, recording and mixing engineer Pete Lewis says, "We didn't use the Munich recording because the band went on in torrential rain and the audience was covered in mud, so they weren't particularly happy. When we got to London the next day it was brilliant — the weather was good, the crowd was vibed up and there were lots of other

NEVER MIND THE RUMORS

Never Mind The Bollocks (Here's The Sex Pistols) has become a punk classic. Leaving aside the clouding issues of the money, the swearing, the choreographed outrage, and what happened to the band afterwards, the album is a tight, raw example of a different type of rock 'n' roll, all tied up by Chris Thomas's straightforward production.

The album was recorded at Wessex Studios, where the band had been putting down demos, with Bill Price engineering. Thomas was contacted by the Pistols' Machiavellian manager, Malcolm McLaren, and invited to produce the album proper, which he agreed to do, not so much for the socio-cultural significance but because he felt he could make a good rock 'n' roll record with them. "I thought they were fantastic," he told John Tobler and Stuart Grundy, "especially on 'Anarchy In The UK,' there was the most incredible atmosphere in the studio."

One thing that has dogged the record is the persisting rumor that the Pistols did not play everything on it. In particular, legend has it that it was Chris Spedding, a lead-

ing session player of the time, and not Steve Jones who produced the barbed wire guitar sound that is so identified with the band. Thomas has said of this, "Despite all the rumors, Chris Spedding didn't play anything on their records." Spedding himself recently said that he was involved with the Pistols by supplying equipment for their rehearsals and by giving early encouragement, but confirms that he didn't play on *Never Mind The Bollocks*. Thomas added that the only substitution came with Sid Vicious, whose bass work was largely played by Steve Jones.

The discussion rumbles on, but engineer Pete Lewis hopes that *Filthy Lucre Live* will dispel any doubts. "If you listen to this and then to *Never Mind...*, you can tell that it's the same guitar player," he says. The album itself is more than just a live rehash of the studio original; even though it is 20 years on, and has the additional pleasure of the boys thrashing through "(I'm Not Your) Stepping Stone." Tongue in cheek? Coming out the other side...

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good bands from the same era on the same bill."

SORT OF STUCK IN THE '70S

As well as the now standard CD release, *Filthy Lucre Live* has been pressed onto vinyl as a "throwback" to the '70s, but this intention didn't stop the show being recorded in the digital domain. "It's just the convenience of digital," explains Lewis. "It would have been great to have recorded it all on analog, but it's just too risky, what with continual reel changes and so on. And

if anything had gone wrong, then we wouldn't have known with analog, but with digital, it either works or it doesn't."

The two Sony 3324's were loaded into a transit van and driven on site, located next to a SSL-equipped BBC radio outside broadcast truck, which was relaying the concert live to air on BBC Radio 1FM. "We recorded in 24-track," says Lewis, "running a master machine and a safety, starting the second recorder five minutes after the main to get a good overlap. This meant that we had 90 percent of the show for

sure, which is a good safety margin."

Stage feeds came into the BBC truck, where studio manager Ted de Bono prepared the radio broadcast mix on the SSL, with the desk's mic gain faders providing the level output to the 3324's next door. "Originally we had booked another mobile to do the gig," Lewis says. "We didn't know that the BBC was going to be there as well; they approached us and it turned out to be a good idea to do both at the same time. The recordings were made flat, straight off the mic gain, because sometimes you can get caught up in the technology of things. As long as it sounds good at the time, that's all right."

As the Pistols are only a three-piece band plus vocals (we couldn't forget Johnny), there were only 19 feeds coming from the stage, which were fleshed out with three stereo pairs to capture audience reaction. "We put two mounts on the stage to hear the audience," says Lewis, "and two more at the mixing position to hear what the engineer was hearing. This gets the ambiance and the sound of the rig, so it's a live gig that's about you and 25,000 friends."

POST-SHOW WRAP-UP

The tapes were taken to The Townhouse studio complex in West London, ironically a member of the EMI Group, particularly as the Pistols' paean to the venerable record company sits smugly on the album. Thomas and Lewis decided to give themselves plenty of choice in their lay-back formats, mixing on 48-track and transferring from there to DAT and 1/2-inch tape, with a back-up and comparison version made on two spare tracks of the master multitrack. The master mix was in turn laid onto DAT and 1/2-inch tape. "The 1/2-inch sounds very rock 'n' roll," explains Lewis, "but we've got both there and sometimes one wins, sometimes the other. We also mixed to two tracks on the 48-track as a back-up and a comparison."

As the transfer to DAT was made, the mixes were loaded into a Studio Audio SADIe Portable, which was used for tracking and editing out any pauses between numbers, plus making CDs for the crew and band so that everyone could hear how the project was progressing. "Everything that Chris [Thomas] does is compiled and mastered in the studio control room," explains Lewis. "Sometimes this means that everyone gets so close to something, knowing how it sounds, so it's good to be able to take a CD home and

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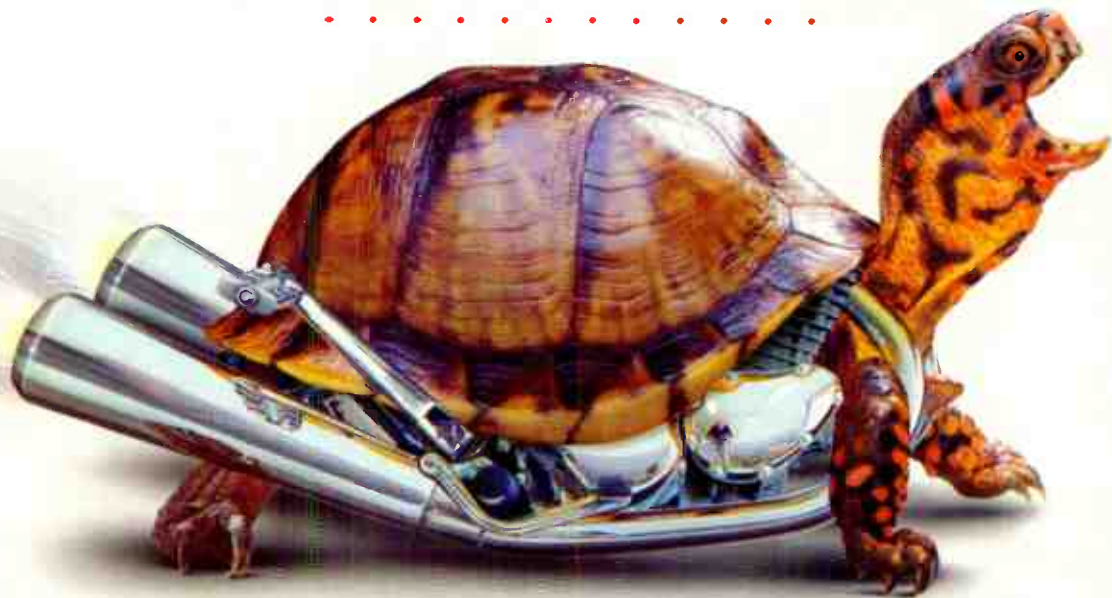
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listen to it in a different environment."

The SADiE Portable was fitted with a 4 GB removable drive, which gave Lewis enough capacity for tracking the album, even though the release CD contains 15 tracks and runs to 53 minutes 38 seconds. "We never really ran out of space on the 4 GB drive," he says, "on previous projects I've had up to 9 GB. With the SADiE you don't lose anything; it doesn't go wrong and the audio quality is excellent." When it came to the final transfer for mastering, which was also done at Townhouse, the completed mixes were laid onto [Sony] 1630.

Mixing was carried out in Studio 4 at The Townhouse, using the room's SSL 4000 console fitted with E Series EQ and a G-Series computer. There were a total of 72 inputs, using only 34 faders.

THE REAL THING

As rumors have persisted that the Pistols didn't play on *Never Mind The Bollocks* (rumors that have been consistently refuted), it is perhaps natural to think that *Filthy Lucre Live* would have undergone some cosmetic touches in the mixing suite, but Pete Lewis is adamant that there were no overdubs or repairs.

"There weren't any real mistakes," he states, "it's what they played and how they got out of the mistakes that they did make. The basic brief was to make it sound like a gig, so we didn't do that much to it in the studio. We only did a few rides during the mix, mainly on John Lydon's vocals and the guitar solos. They're only a three-piece band — how many mistakes are they going to make?"

Although the recording was made flat, Lewis says that the minimum interference policy also carried over to EQ on the mix, something that was down to Chris Thomas's style of production. "Chris has the most amazing set of ears," comments Lewis, "and he can make things sound like how he wants them to. In this case it sounds like a live gig. As far as EQ went, we put a little bit of top on the vocals, rolling off the bass as well, largely because John sings very close into the mic. We brought in a lot of tube equipment to warm things up but we only used a Pultec EQ on the bass drum because the quality of the 48-track is perfect."

Perhaps this minimalist approach came about through the undoubted confidence of the reformed Sex Pistols once they got back on stage, and particularly the strutting Lydon, who remarks at one point, "Well, we're not that f***** bad after all, are we?"



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A Surround Sound Primer

Surround sound, the future of audio, is something so dramatic that it will forever change the way we record, mix, enjoy, and listen to music

BY BOBBY OWSINSKI

A few months ago I went to the first IAMM (International Association of Multichannel Music) conference and heard some 5.1 surround sound [the playback standard that the upcoming Digital Video Disc (DVD) will use] demos and I knew that I could never listen to or make music any other way again. The sound was simply breathtaking. As a producer, it's my job to make the music larger than life, but this was far bigger than I'd ever heard it before. Since I was starting a record with blues legend Joe Houston the next week, I begged the record company (Shattered Music) to give me a few extra mixing days to mix in this format in preparation for the future. What came next was an adventure into that future.

WHAT IS SURROUND SOUND?

What is this 5.1 surround sound and why is it bigger and better than the stereo that we now enjoy? The 5.1 means that you have six discrete speaker sources: three across the front (left, center and right); two in the rear (left surround, right surround); plus a subwoofer, known as the Low Frequency Effects channel, or LFE, which is the ".1" of the 5.1 (see fig. 1). This is the same configuration that you hear in most movie theaters since 5.1 is the speaker spec used not only by THX, but popular motion picture release formats such as Dolby Digital and DTS.

A BIT OF HISTORY

Surround sound has in one form or another been with us for more than 50 years. Film has always used the three-channel "curtain of sound" developed by Bell Labs in the early '30s since it was discovered that a center channel provided the significant benefits of anchoring the center by eliminating "phantom" images (in stereo the center images shift as you move around the room) and better frequency response matching across the soundfield. The addition of a rear effects channel to the front three channels dates back to 1941 with the "Fantasound" four-channel system utilized by Disney for the film *Fantasia* and in the 1950s with Fox's Cinemascope, but it didn't come into widespread use until the '60s when Dolby Stereo became the surround *de facto* standard. This popular film format uses four channels (left, center, right,

and a mono surround, sometimes called "L.C.R.S.") and is encoded onto two tracks. Almost all major shows and films currently produced for theatrical release and broadcast television are presented in Dolby Stereo since it has the added advantage of playing back properly in stereo or mono even if no decoder is present.

In the '80s, with the advent of digital delivery formats capable of supplying more channels, the number of surround channels was increased to two and the low-frequency effects channel was added to make up the six-channel 5.1, which soon became the modern standard.

And, of course, no surround story would be complete without a brief mention of Quad from the 1970s, the music industry's attempt at multi-channel music that killed itself as a result of two noncompatible competing systems (a preview of the Beta vs. VHS



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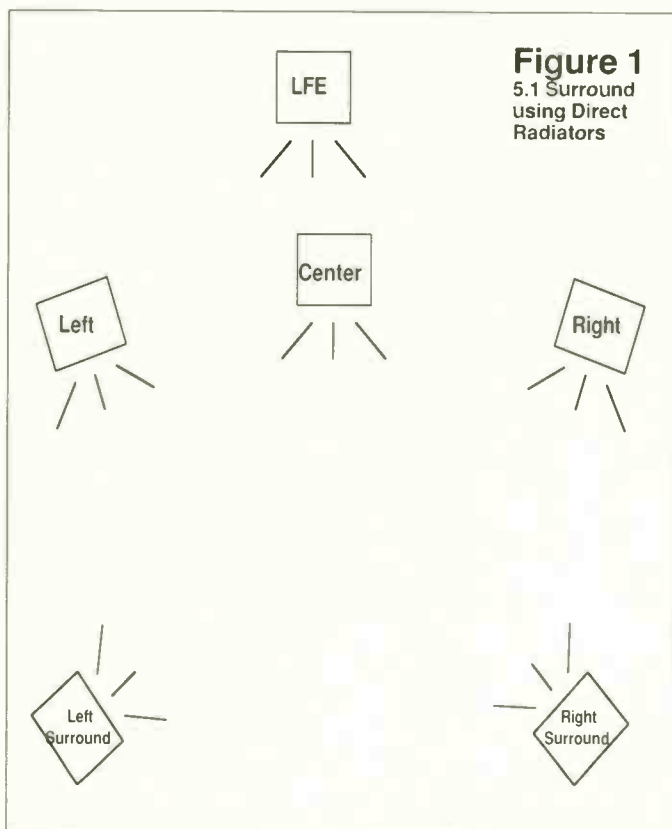
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war) and a poor psychoacoustic basis that suffered from an extremely small sweet spot.

WHY 5.1 IS BETTER THAN STEREO

When you listen to 5.1 surround you'll notice quite a few things:



1. The sonic clarity is enhanced because the center channel anchors the sound and eliminates any "phantom" image shifts that we take for granted in stereo.

2. There is no "sweet spot" *per se*. Actually, the whole room becomes a sweet spot in that you can move around freely and never lose the sense of clarity, dimension, and spatial continuity. One listener described it as an "audio sculpture," in that, just like when you walk

around a piece of artwork and get a different perspective of the art, when you walk around the 5.1 room, you get a different perspective of the mix. You might get closer to the guitar player, for instance, if you walk to the left of the room. Walk to the right and you're closer to the piano. Indeed, you don't have to even be in the speaker field to get a sense of the depth of the mix. This was perfectly illustrated while we were mixing and had people sitting on a couch behind the surround speakers who thoroughly enjoyed the experience.

3. Speaker placement is very forgiving. Yes, there are standards for placement (see the sidebar entitled "A Case Study"), but I've found these to be very noncritical. The sense of spaciousness remains the same regardless of how haphazardly the speakers are distributed around the room. In fact, speaker placement is far more critical in stereo than in surround sound.

During mixing, I found several other surprising advantages.

1. Clarity of instruments. Everything sounds much more distinct as a result of having more places spatially to sit in the mix. This means that you spend a lot less time EQing, trying to get each instrument heard.

2. Added dimension. We were

SURROUND SOUND: WHEN?

Surround sound for music is currently being driven by the home-theater market, which is reported to be the fastest growing segment of the consumer-electronics industry. With a total of 20 million home-theater systems in use (10 million in the U.S. alone), these consumers now want their CDs to sound like their laserdiscs. But is that market sufficient to push the new technology? Says Tomlinson Holman, THX inventor and the one who coined the term 5.1, "I think it's already caught on in the public's eyes. It's the public's asking for sound to light up those additional three loudspeakers that is going to drive things."

And the public may have its way as soon as later this year when DTS releases its home-theater decoder (but you need their own custom CDs to use it) and next year when the Digital Video Disc (on which 5.1 will be standard) is introduced. Plus, it's been rumored that two major car manufacturers will make some form of surround decoder standard in their 1997 models. And, of course, there's also High Definition TV, and cable and satellite delivery, all of which contain 5.1 audio in the specs.

With these glowing reports, you'd think that the record labels would be falling over themselves to get surround product out there ASAP, but Mike Frondelli, creative director at Capitol/EMI, offers a dose of reality. "From what I see, the labels are supportive of any new technology that comes along, but they're unwilling to throw a lot of dollars into it until they see that there's a market for it. The problem is that the installed user base of home-theater systems is the only one that can take advantage of the technology." Frondelli, though, also sees the key to success: "Part of the problem right now is that the artists need to champion it and use it in a very creative way so the record companies are willing to put out another format. I don't think people want to buy the same record yet another time, but I think they'd be willing to buy new material that was specifically created for this market."

Holman agrees that it's essential to have the musicians and producers lead the way. "There's a number of units on the market that will take a stereo program and process it to drive signals for all those loudspeakers, but that's not under the control of the producer. Eventually musicians and producers will have to be directly involved in making these mixes for the home-theater sound systems."

And just when you were coming to grips with 6-channel mixdown and playback, Holman gives us another dose of the future. "If you think that mono to stereo is a difference everybody can hear, and two to five channels is clearly audible, the next big step is from five to ten channels." Boy, are the equipment manufacturers gonna love this.

—Bobby Owsinski

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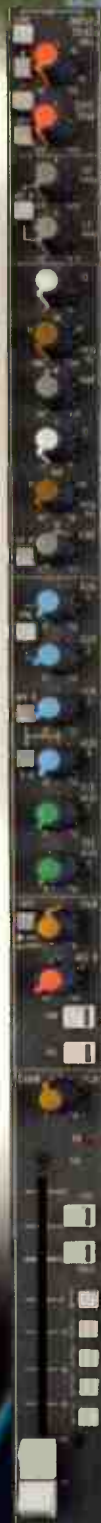


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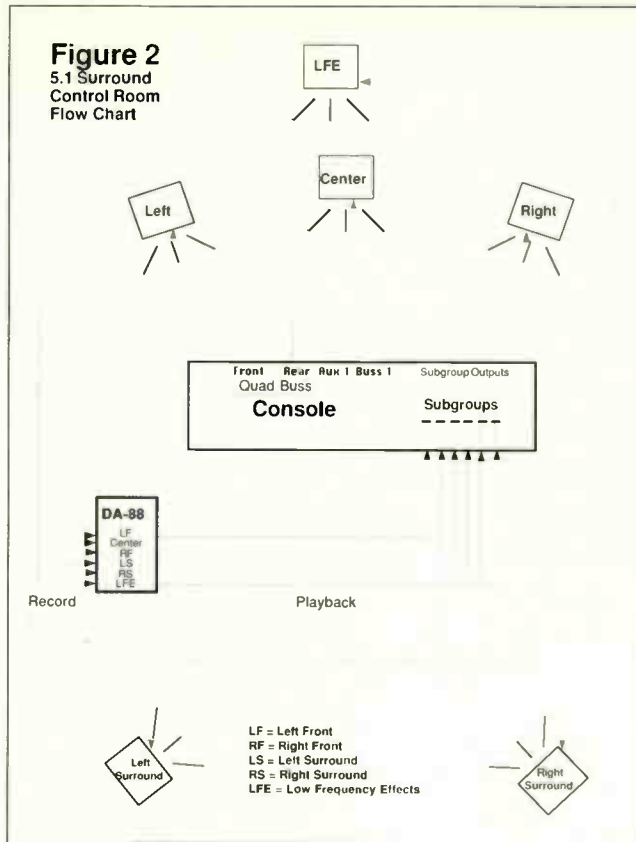
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most surprised to find that even mono tracks are big and dimensional! No longer is there a need to "stereoize" a track by adding an effect. This point was pointedly brought home when a rather bland mono background vocal track was brought up in the mix and it sounded so big after we spread it across the speakers that we couldn't believe it.

3. The ambience is different. Because of the naturally increased clarity and dimension, you no longer have to spend as much time trying to artificially add space with reverb, delays, and so on. This is not to say that you won't use these effects at all, but the approach is different since surround automatically gives you the depth that



you artificially create with stereo.

There are differences between surround for picture and for music. Normally, in the theater, all of the primary sound information comes from the front speakers and the surround speakers are utilized only for ambience info in order to keep your attention on the screen. The LFE is intended to be used just for special effects such as explosions and earthquakes, and is infrequently used. One of the reasons that the surround speakers don't contain more source information is a phenomena known as the "exit-sign effect," which means that your attention is drawn away from the screen to the exit sign when the information from the surrounds is too loud.

SURROUND SOUND: A CASE STUDY

Just wanting to mix in surround sound is not enough. It takes a big commitment in extra hardware to make the grade, unless, of course, you are on a film dubbing stage or in a post room already set up for multichannel mixing.

You will need: 5 identical speakers (preferably powered), plus the amps to drive them; 1 subwoofer (plus amp) with 125 Hz low-pass filter; the ability to pan the signal to five mix channels; the ability to monitor six mix channels; and a DA-88 tape machine (the *de facto* standard) to mix to.

When I decided to mix blues great Joe Houston's project in 5.1, it was initially made possible by a chance meeting with JBL's David Kim at the IAMM conference. Wanting to help facilitate the format (and what manufacturer doesn't), David offered to send us five self-powered JBL 6208's, which immensely helped the process. [See *the Audition of the 6208 in the May 1996 issue.*]

Once we had the monitors, the next problem was placement of the rear speakers, which is supposed to be at 120-degree angles from the listening position. In our case, placement was inhibited by the door into the control room on one side and another door into the machine room on the other. Ultimately, we found the placement to be very forgiving and not that big a deal. For the subwoofer, we used the soffit-mounted main speakers, turned off the tweeter amp, and rolled off the low-pass filter on the playback channel.

Mix channel assignment to the mixdown deck was another problem. In this case, the '70s vintage Neve 807E had a quad mix bus, which meant that we could easily pan both left to right and front to back (see fig. 2). The center channel was put on a separate aux bus and the LFE channel was accessed through multitrack bus 1. Another way to do it would have been to use six aux busses for mix assignment, but you've got to have a console with plenty of aux sends so there will be some left over for effects. Although both methods work, neither is totally satisfactory in that panning is very imprecise. This is one of the areas where the new generation of post consoles with LCRSS (see glossary) panning really shine.

Monitoring is something we always take for granted as we're used to just reaching up for the Control Room Monitor pot to turn the level up or down. In 5.1 this is no longer possible unless you have either a film-dubbing console or one equipped with a postproduction module, like a Neve VRP or Otari PicMix, that can control six channels at once. In our case, we simply routed the outputs of the DA-88 mixdown deck into six of the subgroup channels of the Neve 8078, then connected the direct outs of the channels into the powered monitor speakers to control levels (see fig. 2). This is a little awkward in that you have six level controls instead of one, but it works.

Reverb is another potential problem. Although it's possible to take just one stereo reverb and pan it to all speakers, it sounds flat and uninteresting. In our case, Steve DeFuria of Lexicon brought a prototype multichannel reverb that allowed parameter control of all five main channels. This really brought the mix to life as the multichannel ambience was elevated to new heights of depth and realism.

—Bobby Owsinski

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



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Music-only surround sound has no screen to focus on and therefore no exit-sign effect to worry about. Take away the screen, and it's now possible to utilize the surround speakers for more creative purposes.

TWO SCHOOLS OF THOUGHT

There are two schools of thought on how surround sound for music should be mixed. The classical way puts the music in the front speakers and the hall ambience in the surrounds, just as if you were sitting in the audience of a club or concert. This method frequently underutilizes the LFE channel by not using it at all or deriving it from the five main speakers. The demos I heard at IAMM where mostly classical and jazz, and they followed the same pattern of keeping most of the main band/orchestra information in the front speakers with just ambient info in the rear.

Now I believe that rock 'n' roll (and music in general) should be bigger than life, and using the surrounds for ambience is just not big enough for me. The more dramatic the better, I say, so I lean towards

SURROUND SOUND GLOSSARY

5.1: A surround-sound system utilizing six discrete speaker sources. Three across the front (left, center, right); two in the rear (left surround, right surround); plus a subwoofer (known as the Low-Frequency Effects channel or LFE.) (See fig. 1.)

DAD: Digital Audio Disc. An audio-only DVD that will employ six-channel 5.1 surround, and maybe even more channels, as standard.

Dolby ProLogic: The home-theater decoder needed to decode a Dolby Stereo program.

Dolby Stereo: Surround system using four channels (left, center, right, and a mono surround) but encoded onto two tracks. It has the added advantage of playing back properly in stereo or mono even if no decoder is present.

DTS: Digital Theater Systems. This company has one of the most popular digital feature film release formats. Will introduce their own home theater 5.1 decoder soon.

DVD: Digital Video Disc [the precise def-

inition is still being debated]. The upcoming video CD format that will employ 5.1 surround as standard.

LCRS: A 4-channel system using left, center, right, and mono surround speakers.

LCRSS: A 5-channel surround system using left, center, right and stereo surround speakers. This becomes a 5.1 system with the addition of an subwoofer (see LFE).

LFE: A subwoofer which is the ".1" of the 5.1 (see fig. 1). The LFE channel rolls off somewhere between 80 and 125 Hz (depending on the system) and has an additional 10 dB of headroom.

Phantom Images: In stereo, the image that appears to come from between the speakers. This center image shifts as you move around the room

THX: A sound system package for theaters, consisting of speakers, amplifiers, and room voicing that employs 5.1 surround as standard. It is a standard designed to make the quality of sound more consistent from theater to theater.

—Bobby Owsinski

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the second surround mixing method that puts the listener in the center of the band and envelopes him or her with sound. In this case, the band is spread all over the room via the five speakers and the LFE is used for bass and kick, which is also spread to the other speakers as well. The result is that it's bigger than anything you've ever heard. When you listen to Joe Houston in surround, you're on stage with Joe and he's singing and playing his sax directly to you.

PROBLEMS ALONG THE WAY

Despite the dramatic improvement in sound, there are still many hurdles to cross before surround sound becomes the standard listening fare. There are currently three major barriers, all of which are rapidly falling.

The first is the delivery medium. There is currently no product on the market that can deliver 5.1 surround, although almost all upcoming technologies — including DVD, HDTV, and cable and satellite transmissions — have 5.1 as standard in the specs (see the sidebar entitled "Surround Sound: When?").

However, DTS is soon releasing a decoder along with a fair amount of their own custom multichannel encoded CDs (including the Joe Houston CD) to support it, so this can now be within the immediate reach of consumers.

The second is a standards issue. An audio-only DVD has such an immense storage capability that the sample rate can be increased to 96 kHz (the current CD is 44.1 kHz) and the word length to 24 bits (currently 16). Although this means that sonic quality will skyrocket, it also means that the number of discrete channels will be limited, and there is considerable lobbying to make that limit as high as possible for future use (see "Surround Sound: When?" sidebar again). Luckily, the Audio Engineering Society has a task force that's addressing that issue as you read this.

The last is a hardware barrier, both for the consumer and the musicians, engineers, and producers making this multichannel music. Consumers will have to have at least six speakers and amplifiers, as well as a DVD player or surround decoder to hear surround.

Recording studios will have to upgrade to support six discrete channels of mix-down information and include things like multichannel panners, reverbs, and monitoring (see the sidebar entitled "A Case Study"). That's a big monetary commitment, but there's no doubt that it's going to be worth it at some point.

Despite the above roadblocks and unknowns, just about everyone who has heard the format remains wildly optimistic about it. I've done demos for people that range from engineers, recording artists, and the everyday buying public (who in the end really makes any format go), and the overriding comment has been, "How can I get this in my home now?" Yes, I have heard the future and it's definitely surround sound. Every project I produce from now on will be done this way!

Bobby Owsinski is an L.A.-based blues musician who spends most of his time as a TV and record producer. He also lectures at Trebas Recording Institute about his former lifetime as a recording engineer.

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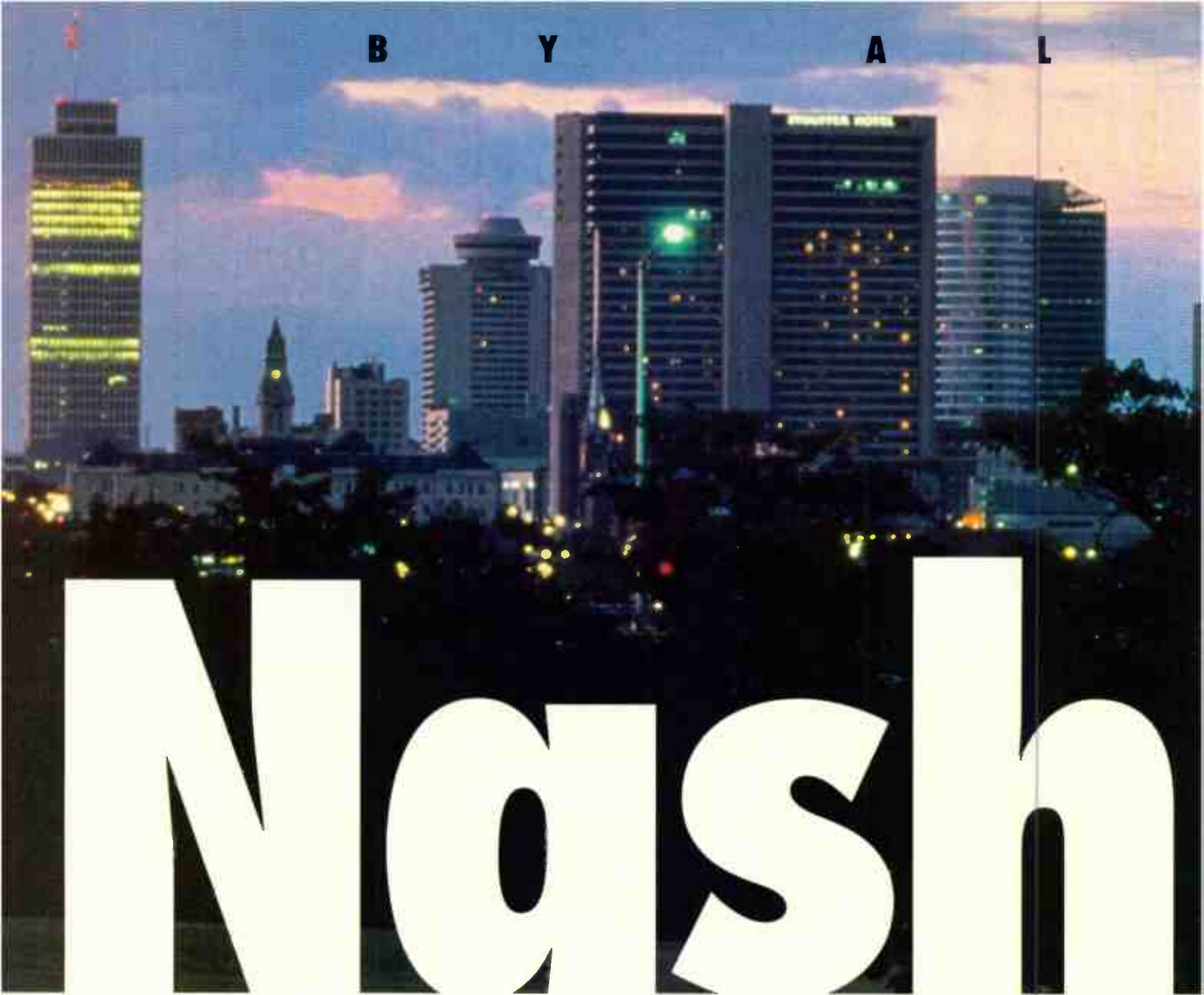
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Nashville

*A look at
Music City
— from the
top and
bottom*

I TOOK MY leave of the City of Angels six and one half years ago to do whatever the opposite of carpetbagging is in Nayesh-veal, Ten C as they pronounce it down here. I had had my fill of the music business per se; I had persevered for 32 years, made my little mark, and satiated most of my goal desires. It was a time of change and I knew I needed another location. I had dropped out of the biz, but I would still run into the “music biz types” at the market, the movies, or a concert. I didn’t want to see these people anymore. I *really* wanted to drop out. I bumped into Steve Cropper in Ralph’s Supermarket in the San Fernando Valley one smoggy afternoon. *I never mind running into Steve.* I asked him what he was up to and it seemed he was trying desperately to sell his L.A. house because he had just emigrated to Nayeshveal.

“You’d love it down there, Al. I’m tellin’ ya, check it out,” he enticed.

And because I was ready to do such a thing, I took an exploratory journey. Now, mind you, I had spent a fair amount of time in Nashville in my life up till then. I first went with Bob Dylan to record *Blonde On Blonde* there. Charmed by that experience, I went back and cut *I Stand Alone*, my first solo album there. Through the mid-’70s, I returned many times to produce albums there, utilizing the various Memphis and Muscle Shoals expatriate musicians who had gathered there for good. And lo, it *was* good. *Except for the food.* But I really hadn’t been back for about 15 years, so I spent a week looking around and found what I wanted. Nice weather, nice people, slightly better food, and no matter what direction you walked in for a distance of 200 miles, you were certain not to bump into anyone from Geffen Records. For this time in my life, aged 46, it seemed a wise move.

Away I went. In May of 1990, I

W i l l i e

ESCAPE FROM L.A.:

The Nashville skyline welcomes those leaving the West Coast to Music City USA.

BELOW: The Grand Ole Opry keeps tourists out of the downtown area.

bought a nice house that would have sold for \$800,000 in L.A. (at that time) for less than a quarter of that. On New Year's Eve of 1990, I rescued a cute puppy from the pound, and that was the last piece of the puzzle.

Today's Nashville is radically different from that of the mid-70's. For one, there is now parity of food quality in at least half the restaurants. But don't be misled. This is *not* Music City, USA, dear readers, this is *Country* Music City, USA.

Now what does this mean, Al?

Well, for one thing, someone put some kind of curse on rock 'n' roll in this town. No rock act has ever skyrocketed out of Nashville. (No, Jason and the Scorchers doesn't count. They did *not* skyrocket.)

So, if you don't play country, don't come here to be discovered. That is to say, you may be discovered, but *the curse* will instantly befall you! Now, that

said, there are some great, organic musicians and singers that live and play out here that don't play country — Johnny Neel, late of the Allmans; Jimmy Hall, late of Wet Willie; and Larry Carlton, one of the great jazz guitarists of all time, to name but three. The Queen Of Live Music in Nashville, however, is Jonelle Mosser.

Never heard of her?

She's cursed, ya know.

Don Was heard her play live while having a drink here one

If you don't know who Al Kooper is, please stop reading this magazine.

night and signed her right up. Now she had one of the best bands in town, called Enough Rope (how prophetic). So Don got her to vacation from her band and join one of his side trips — a band called The New Maroons with Ringo Starr on drums, Don Was on bass, Benmont Tench (from the Heartbreakers) on key-



Skyline by David Wright, Grand Ole Opry courtesy of the Nashville Convention and Visitors Bureau



"Souvenir shops pretending to be better than that like The Hard Rock Cafe, Planet Hollywood, and the Wildhorse Saloon, smile at you as you stroll downtown looking for something to remind you that you're still in Nashville."

boards, and Mark Goldenberg on guitar. They played at Farm Aid, cut an album for Don's own label, and Jonelle walked around town like royalty.

Silly girl: *she forgot about the curse.*

The next instant, Don Was folded up his label and Jonelle and fellow Nashvillian Felix Cavaliere (also signed to Was's label) found themselves in Nashville, to quote Maxine Nightingale "...right back where they started from..." For Cavaliere, whose Rascals' songs sell cars and tanning oil nowadays, it was no great loss. For Mosser, it was everything. Her hand had splintered while she was lovingly glancing at Was and Ringo, so she assembled a new band, albeit, not as good as the old one, and went back to being The Queen Of Live Music in Nashville, another victim of *the curse*.

'Shville (as our Jewish residents refer to our town) is the songwriter's capital of the world. There are some amazing writers living here that have raised the craft itself up a few notches. If you get in the clique, you can make some large "mailbox money" (as they refer to royalty checks here) in no time. Matraca Berg, (pronounced Muh-trace-ah; so you don't embarrass yourself with a Ma-track-

and Burr, Dennis Morgan, Mike Reid, and Tom Shapiro are just a handful of about 20 more who are all over the country charts on a consistent basis.

a like I first did), Gary's Nicholson

Today in Nashville, 95 percent of all writing is done in "dentist appointments." These are three-to-four-hour blocks of time that are prebooked by the writer's involved. So Gary Nicholson will get a call from, say, Delbert McClinton asking Gary



MR. KOOPER'S COLUMN will begin appearing regularly in EQ beginning next month.

Photo by Jim Herrington

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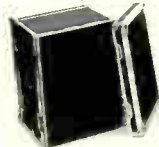
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to hold Tuesday at 2 PM for him. On Monday at 10 AM, Del will write a song with Writer A until 2 PM. Then at 2 PM he will write with Writer B until 6 PM. By the time he gets to Gary, he will have written three songs with three other writers in a two-day period. That's why I call 'em dentist appointments. Personally, I feel it's demeaning and uninspired, but that's how it's done here in the '90s — and it works quite well for them. What do I know?

Another peculiarity is Nashville's famed numbers system. This is a simplified way of reading music that is commonly used by studio musicians at every session. The chords are replaced by their musical numbers (e.g., if you're in

the key of C, C is 1, F is 4, A minor is 6m, etc.). They are written in 16-bar phrases on the paper (e.g., 6M 2 5 4 1 3m 4 5 etc.; each number represents one bar). As far as I know, this is an aberration common only to Nashville. At any rate, any musician worth his salt can translate this system in a matter of moments.

The studio scene is hard to break into. The musicians on the A list are some of the most amazing ones I've heard in any city. Eddie Bayers on drums, Glenn Worf on bass, Brent Rowan on guitar, and Matt Rollings on keyboards could scare the pants off any L.A. or NYC musician. And then wouldn't they look silly sitting around in their underwear?

The bars are filled with either songwriter-in-the-round shows or R&B bands. There are very few country bands playing the bar circuit. Ergo, it's easy to hear non-country live music if you go clubbing. The musicianship level in the clubs is the highest of any city in the U.S. Even the so-called local punk bands are comparatively more musically literate than any of their contemporaries in any city. For instance, the best blues band in town consists of studio guys, who are blues historians, blowing off steam one or two nights a week. The only city that could give them competition is Chicago, and they'd probably only open a few eyes there. The Bluebloods, together six years, are releasing their first CD on the local Dead Reckoning label this month.

If you just know a few chords, you're good looking, and have a stage attitude, Nashville is *not* the

THE GREENING OF NASHVILLE

WORDS & MUSIC BY
AL KOOPER

You used to be able to park on a slant down Broadway
You could even take a stroll along Second Avenue
And we used to love Centennial Park
In the daytime or in the dark
Before the carjackers and the muggers all came through

THE GREENING OF NASHVILLE

The influx of cash will drag our city on down

My baby and me bought a house right here in Green Hills
The house is still here but my baby is long since gone
Then some stores disappeared one day and
Became the entrance to the Hard Rock Cafe
Now there's no music — just a tour bus
Comin' outa Bradley's Barn

THE GREENING OF NASHVILLE

The influx of cash will tear our city on down

Li'l ole church on the corner
Been here for so many years
Gonna have a big arena next to it
Gotta sell that hockey beer
Wildhorse Saloon
Gonna build Planet Hollywood soon
Hope they leave some room for BB King's

If ya don't want a buncha people movin' here from California
Stop tryin' to make this place the next L.A.
What happened to democracy
Why can't they just let things be?
In politics I guess every dog has got to have his day

THE GREENING OF NASHVILLE

It seems that the cash will
Take away our small town

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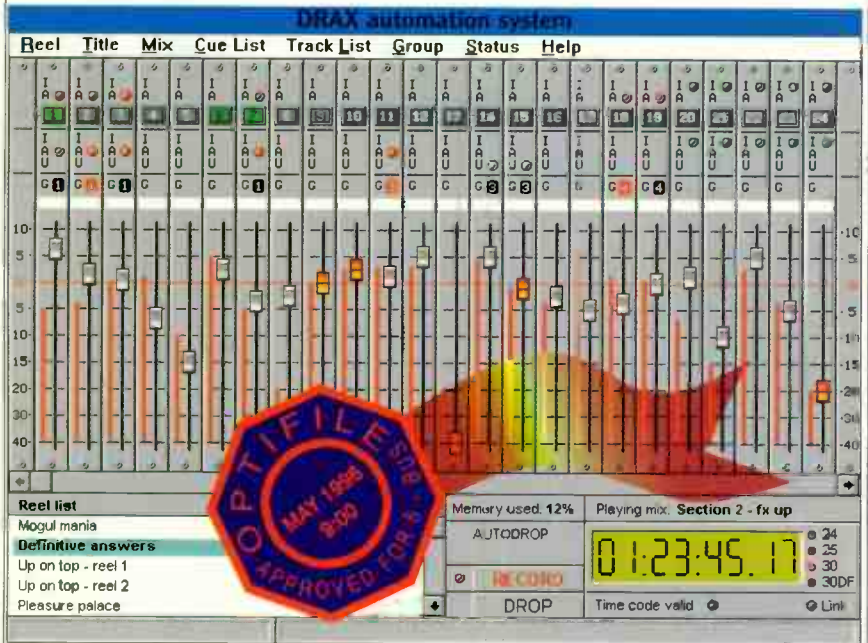
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place where you have a chance of succeeding. And, of course, there's still *the curse* to overcome.

Adrian Belew and Jill Sobule felt the curse and had to move away to achieve success. Adrian has now moved back, no longer concerned about it. Jill's gonna see how her third album does first.

Nash Vegas has its share of non-country, veteran musical residents. Michael McDonald, Ed King, Felix Cavaliere, Leon Russell, Larry Carlton, Tony Joe White, John Prine, Steve Winwood, and Donna Summer are but a few of the immigrants. But Nashville has begun to change in an inevitable, ugly way.

I always thought the city fathers here were geniuses. The whole tourist business was set up on the outskirts of town by the airport at Opryland. A giant theater, hotel, and theme park attracted people from the world over. They would mostly never leave the Opryland complex during their stay in our fair city. Locals could easily circumnavigate the downtown area, even at the height of tourist season.

Those days are over, my friends. Some new "geniuses" decided to gentrify the downtown area and began with some pretty bold strokes. A huge 20,000-seat arena juts out onto Broadway at 5th Avenue now. Second Avenue, which remained unchanged from its '50s look, is a whole new tourist trap thang now. Souvenir shops pretending to be better than that like The Hard Rock Cafe, Planet Hollywood, and the Wild-horse Saloon, smile at you like rapists as you stroll downtown looking for something to remind you that you're still in Nashville. When the arena opens, a whole new set of horrors will take place when 20,000 people try to park their cars and then exit the arena later. I'll read about that carnage in the local paper. I'll be in my basement studio (Subterranean Homesick Sound) non-stop on weekends from then on.

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World Radio History

If I didn't have that wonderful home studio (TASCAM 3500 console, TASCAM DA-88's, Electro-Voice 802 nearfields, Korg synths, Rane outboard gear, Lexicon JamMan, and Audio-Technica, Sennheiser, and E-V mics), I wouldn't have a lick of trouble finding a suitable place to record. I love smallish dead rooms. All the Skynyrd albums and the first Tubes album I produced were all cut in rooms like that.

When I first arrived, I found a great room two blocks (walking distance) from my house. However, within two years they rebuilt the room to be live and the fun was over. I still mix all my stuff in the control room there,

but, sadly, the room don't work for me no more. However, most studios in town have huge A rooms and similarly small B rooms with a wide price range. Digital mastering (the way to go today) is readily available, and people are making great-sounding records here. Mark Knopfler cut a lot of his recent solo album in town. Most folks use their home studios for great demos and still pay the big boys when the serious shit goes down. I've cut about four tracks and a filmscore in my home studio that have been commercially released, but I've cut 60 demos that are just demos as well. When I make my own albums, I book

the real studios. The rule-of-thumb down here is, usually, MIDI demos and real-live musician masters.

The music stores in town still have a lot to learn. Prices are higher than the real big cities and the staffs are blood-thirstily on commission and comparatively incompetent. There are exceptions, but there's no Manny's or Guitar Center vibes or prices down here. I tried to shop here unsuccessfully, so my business usually goes to NYC with a quick phone call. This will hopefully change real soon.

There are some great places to hang out here. The Sunset Grill is a fine restaurant and bar unlike its L.A. namesake. Every Monday night, The aforementioned Bluebloods play at the usually "kempt" Bluebird Cafe. Monday nights it goes from being the premiere quiet listening room to a rowdy, mainstream blues club where Sam, the bartender, slides the longnecks continuously down the bar. John Prine, Gatemouth Brown, Joe Ely, and Billy Gibbons have all been Monday visitors in awe of Michael Henderson's guitar individualism. 328 Performance Hall is host to the visiting headliners like The Band, Son Volt, Everclear, The Subdudes, Little Feat, and John Hiatt (another local). The Exit/Inn handles most of the alternative bookings mixing local talent with visiting MTV bands. The Ace of Clubs plays an eclectic mix of music during the week and turns into a dance disco joint (replete with go-go girls) on weekends. [See the Club Profile on page 104.]

My pet peeves are no New York serious delicatessen and no Chinese food of any repute. Then there's the home hanging factor. Everyone is so focused on making it, on their agendas and priorities, that the little home gatherings I am used to from living on both coasts don't really exist here. Two or three people rarely come over to your house or invite you to theirs, preferring the ambience of a local bar instead. At first, I took it personally, but then I realized, hey nobody is doing this — it's not just me! Maybe twice a year, under the pretense of a "party," do the guys come over to watch my funny video collection. Even NBA games are perused in sports bars. I'm over it — I'm used to it. I do sneak off to NYC quite a bit though; I hang out at Barbara, Nancy, or Mookie's house and order matzo ball soup or Peking duck and then all my friends come over and we watch the Knicks game and shoot the shit. Who knows? Maybe this will be Nashville 2000...but meanwhile check out the sidebar/song "The Greening of Nashville." **EQ**



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CIRCLE 61 ON FREE INFO CARD
World Radio History



Nashville State of Mind

WHAT WAS A nice guy like Tony Brown, president of MCA Records Nashville, doing in Nice, France last week? Could he be following the lead for an undiscovered talent hiding out in the hills of the Alpes-Maritimes? *Not.* The award-winning producer of quality songs and tasty tracks was taking a well-deserved break.

The helm of the MCA flagship is charting right on course with Brown steering the creative wheel. MCA generates the largest piece of the two-billion-dollar (gross sales) country music pie, and Brown served up half a billion of those sales.

This year alone, Brown is delivering first-class product from Vince Gill, George Strait, Wynona, Bobbie Cryner, Todd Snider, David Lee Murphy, and Tracy Byrd, as well as tracks for a Mark Chestnutt "greatest hits" release. He has

*The Demo Queen
takes on the King of the
Nashville Music Scene straight
from Music Row*

also produced hit albums for Reba McEntire, Lyle Lovett, Trisha Yearwood, Marty Stuart, Rodney Crowell, Patty Loveless, and Steve Earle.

With 62 number one singles and 50 million units circulating around the globe with his name as producer, Brown knows his way around a session and a studio. James Burton, of Elvis, Jerry Lee Lewis, & Rickie Nelson fame — not to mention the coolest paisley guitar around — worked with Brown on early Mark Collie sessions. "Tony had an easy way of explaining his ideas to mu-

sicians and a sharp ear," Burton says. "He took care of biz."

"I like being around talented people," Brown, dripping with executive vibe, confessed to the Demo Queen during a recent interview in his plush corner office overlooking Music Row in Nashville.

"Working with Emmy Lou Harris, Cash, and Crowell represented the 'hip' factor, and when I got a chance to work with Reba, I thought everyone's going to think I've sold out." Brown explained, "But guess what: Reba is cool, too. If somebody is esoteric and I think they are really good, I will stand up and fight for them, and if somebody is mainstream and they reach me, I'll do the same. It was eye opening to me, the art of mainstream and the art of left of center, and the sooner that's understood the more fun you have."

Such focus and love of music led

B Y C . R E E D E R

Photos by Beth Gwinn



GETTING DOWN WITH BROWN: Tony Brown stands in the control room of Reba McEntire's Starstuck Studios.

Brown to what he calls "my greatest moment" when he played keyboards with the Cherry Bombs, a band spearheaded by Rosanne Cash and Rodney Crowell. It was this gig that introduced Brown to a then unknown guitarist who sang backgrounds by the name of Vince Gill. Following the Bomb stint, Brown took a job in A&R for RCA and signed Gill, but left three months later for greener pastures at MCA. He still believed in the laid-back tenor, and hooked Gill for MCA after he was dropped, sailing on to produce seven albums with Gill, two of those triple platinum. Defending his

signing of Gill and the deal with it to an L.A. co-worker that asked, "Who do you think you are signing...Elvis?" Brown responded, "Maybe!"

Vince Gill has gone on to win more CMA awards than any other entertainer, including vocalist of the year for the past five years. Reminiscing about signing Gill, Brown says, "Every A&R person's dream is to sign one of your friends."

Sporting a green malachite ring Elvis gave him from his early days of playing piano in Elvis's gospel group, *The Voice*, Brown spoke in a slightly

Southern, yet sonorous baritone. "What I have going for me is my gut, and I love to work with engineers who are on the leading edge like a Roger Nichols or a George Massenburg. Any technical advantage I have comes from the engineer I work with."

Gene Eichelberger, early audio pioneer and famous for wearing T-shirts that said, "When You're Good, You Don't Have To Be Friendly," was one of the first engineers Tony worked with when he hit town. They recorded Shirley Caesar, a Grammy-nominated gospel project, at Quadraphonics Studio on the

Quad 8 console with 2-band EQ or, as Eichelberger put it, "hi and low."

These days Brown has a bigger budget and says, "If I have my way, I cut on a Neve console and mix on SSL. Engineers love SSL consoles because it's a user friendly format and easy to remix on. I initially worked on SSL because of [Jimmy] Bowen. To work with Bowen was a career making move for me."

Jimmy Bowen, who was a successful leader in the push to put country music on the profit ledger sheets, now lives in Hawaii, but maintains an office in Nashville. The unorthodox Bowen took a technologically stunted Nashville by storm and is credited with bringing state-of-the-art recording to Music City. Brown labels Bowen "The Great Professor." Bowen started in the music business as a singer on Roulette Records in the '50s, and went on to work with Sinatra and Dean Martin before the Nashville years. "He taught me how to do a lot of things at once," Brown continues, "and at the end of the day, nine times out of ten, the artist is right." [Jimmy Bowen was profiled in our April '92 cover story.]

Described in his own words as a benevolent dictator, Jimmy Bowen is finishing up his biography, tentatively titled, *Roughmix*, (Simon & Schuster). When asked about Brown, who he recruited to


the A&R staff at MCA in the mid '80s with a promise to let him produce, Bowen said, "The key to Tony is he knows a quality product. I believed in him and his ability to help the artist do the music."

during the overdubs I want to be there for every note that's struck and I want to do every vocal comp myself.


"What intrigues people is how fast country music can be recorded, but when I listen to interviews with the Stones and Eric Clapton they talk about the great recordings they've done in two

days. George Strait and Reba McEntire record tracks in four days, start at noon and end at seven." Brown continues, "And after each song I send the musicians out and do four vocal tracks. I once asked George, who likes to get back to his home in San Antonio, what do I do if I don't get your vocal in those four days? George said, 'Have I ever let you down?' After five albums, I had to say no."

"Tony doesn't twiddle with the knobs," said Chuck Ainlay, an engineer who works closely with Brown. When

A photograph of Jimmy Bowen, a man with a beard and mustache, wearing a white dress shirt and a dark tie. He is standing in a recording studio, leaning against a large, complex mixing console. The background shows various pieces of audio equipment and a window with blinds.

"At the end of the day, nine times out of ten, the artist is right."

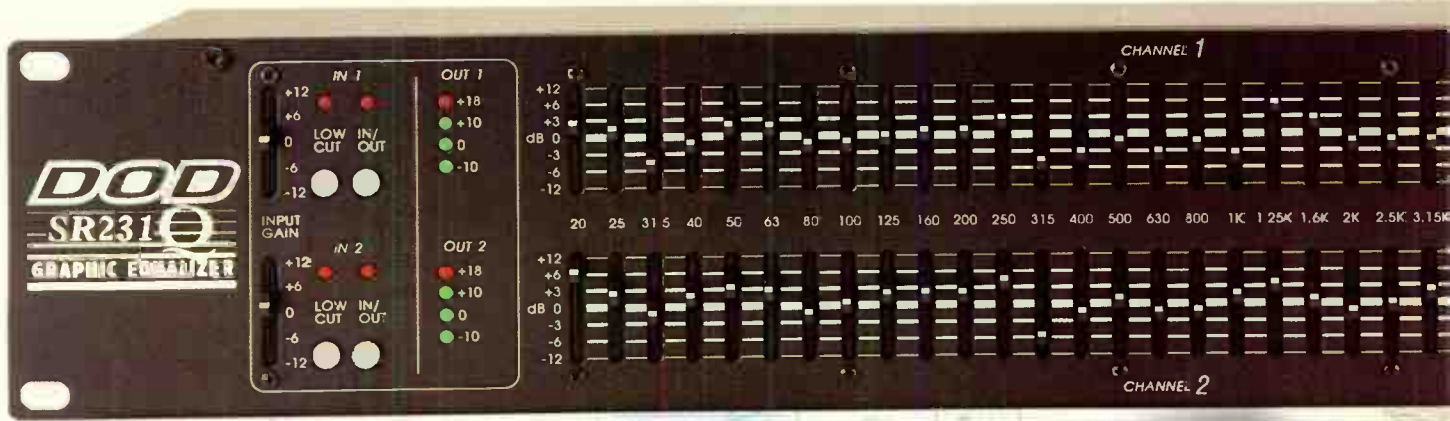
A photograph of Jimmy Bowen in a recording studio, similar to the one above. He is wearing the same white shirt and tie, and is gesturing with his right hand towards a large speaker cabinet with two large drivers. He is standing behind a mixing console.

"I want to be there for every note that's struck and I want to do every vocal comp myself."

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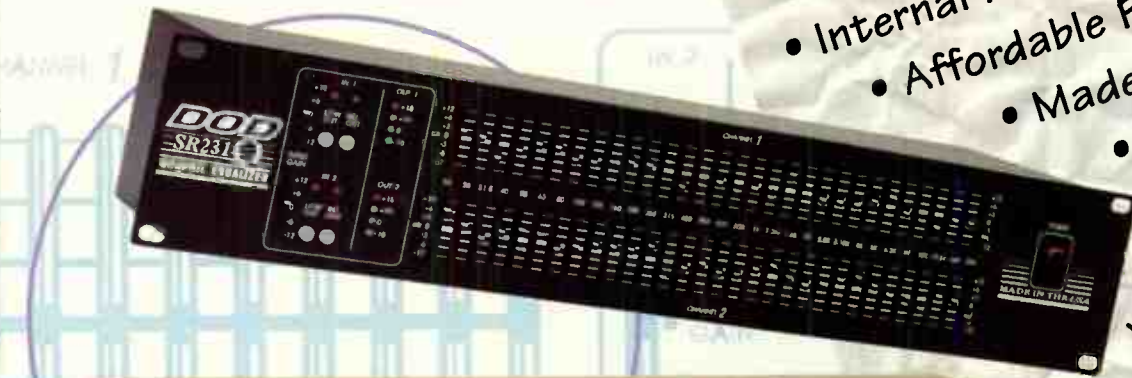
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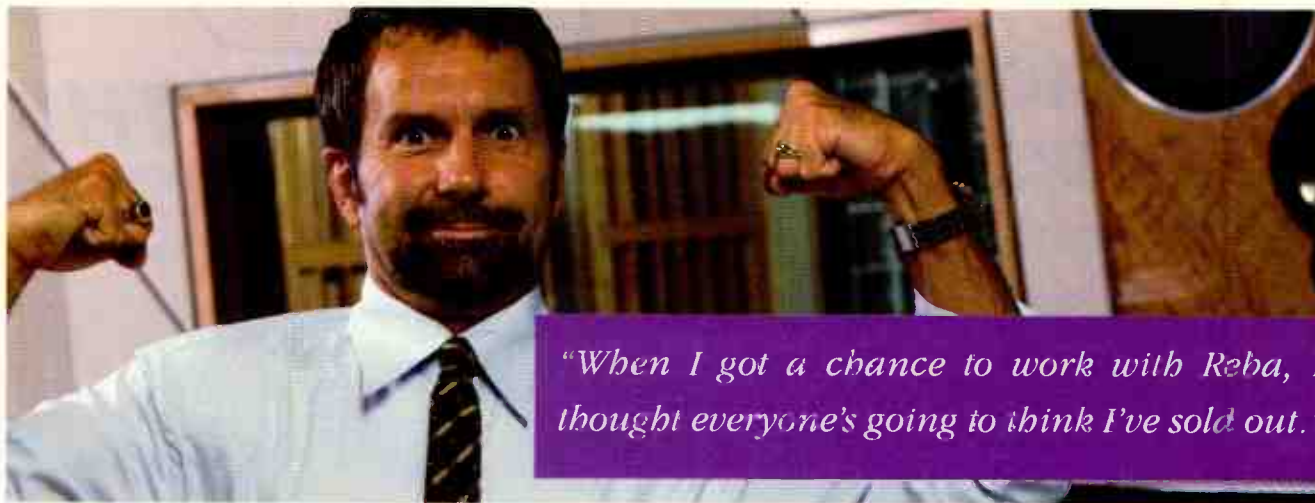


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asked about recording specifics, Ainlay went on to say the team usually mixes one tune a day through the HDCD Box (20-bit) to a Sony PCM 9000 and does not EQ. Recording great vocals is another thing they do well, and, according to Ainlay, it's easy to do with a "good mic and a good environment."

Brown, being a self-proclaimed "dig" (digital) man, uses his gut feeling to pick microphones, sometimes going against the status quo. For picking gear, Brown offers, "If someone says you can't use this mic with this voice, then I say, why not? Let me hear it." On a recent Tracy Byrd project, the Audio-Technica (4050) caught Brown's ear. For Gill he prefers the AKG C12, and on Wynona the Neumann U47.

As far as a good environment goes, there is no shortage of great studios in Nashville. The newest entry (and location of our photo shoot) is Starstruck, affectionately known as Reba's World by the locals, since McEntire et al funded the complex. Designed by Grant and Associates, the same company that brought us Peter Gabriel's Real World Studio and all five rooms at the Hit Factory, Starstruck stands out on Music Row with crisply modern architecture, unique privacy windows that can switch from translucent to opaque, and no corners cut in the gear department.

Both studios in the complex are 100-percent linked together with MIDI, SMPTE, digital, analog, and video, and fully stacked with outboard gear, much to the dismay of the rental companies. If that doesn't phase you, each room contains the SSL 9000 J series console sharing the 48-channel DiscTracker. Being a Demo Queen, the elevated platform in "The Gallery" tracking room for those performers who want to "feel high" won my vote in the "something new" category.

Speaking of demos, Brown was not impressed when asked if mastered



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HOLDS UP ON THE ROAD



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demos caught his attention when looking for material. Songwriters, grasping for anything that might get their material a listen by the right ears, spend money mastering demos, hoping to attract attention to their better sounding tapes.

For Brown, "What makes me like something is the song — the demo could be done on a boom box. Sometimes I copy licks from the demo, but if I like the song, I can hear the band playing it in my head."

Sounds like music to the Demo Queen, and Brown angled in one last important point. "Working with musicians is not unlike talking to a woman. You have to be nice." Nice.

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Ambient Drum Miking Techniques

Tips from Music Row: How to get your microphones in the right place

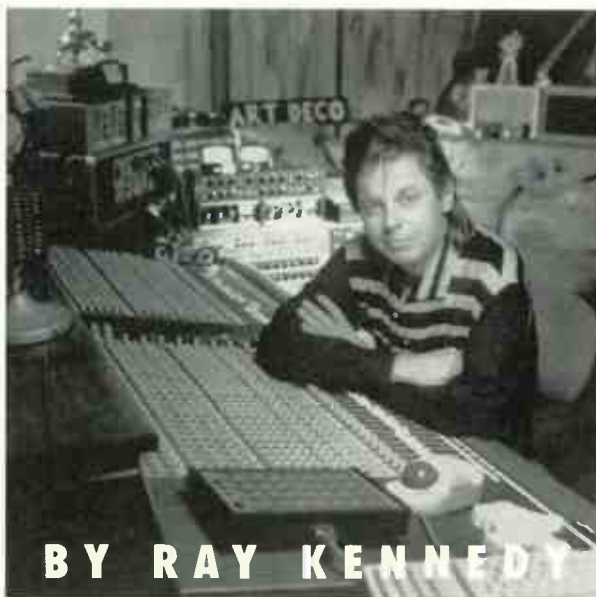
A MIC CAN be compared to different lenses for a camera, with each taking its own unique picture of the sound. Although there are so many variations when painting a sonic landscape, my particular taste has always been toward capturing the most real and precise representation of each and every instrument. If the sound isn't happening, the first thing to check is the instrument itself to determine if it is the right choice, if it needs some work, or maybe just replacement.

In order to get into more specific usage of this approach to recording, let's choose a particularly troublesome subject: drums. It is

possible to get a really good drum sound whether using two mics on two tracks, or 24 mics on 24 tracks. The most practical solution lies somewhere in between.

Of course, the first step is to make sure the entire kit is tuned and tweaked to its most musical state — or at least one appropriate for the kind of track being recorded. The job of placement comes next, and usually some experimentation is required to find the best spot in a room to put a drum kit. I usually favor having the backside of the kit to be closer to a reflective surface and not just out in the middle of a room.

As far as the close-miking of the



BY RAY KENNEDY

kick, snare, toms, hihat, etc., it's a fairly straight-ahead subject. I still swear by Shure SM57's on snare top and bottom (with the phase flipped on the bottom), Sennheiser MD421's on the toms, an AKG D112 on the kick, and a condenser such as an AKG C452 or C460 on the hihat. But I do believe the real magic to getting a great drum sound is in the overhead and room mics. This will be my primary focus from here on out.

HEAD'S UP

My own personal overhead technique is actually a stereo picture of the whole kit that includes some room ambience.

Many large-diaphragm condenser mics work well, but by comparison the new CAD E-300 condenser is at the top of my list. It captures the richness, the depth perception, and the dynamics, as well as the more subtle reflections. The mics are mounted at a 45-degree angle from the vertical axis behind the kit, about seven-feet high and one foot behind the drummer's stool. The capsules are then pointed away from each other at approximately 90 to 110 degrees and 12 to 20 inches apart, depending on the spread of the kit. If the cymbals are set really high, I recommend raising the mics up to eight feet. This technique usually works best with the pickup pattern set to cardioid. Flipping the phase from the rest of the close mics also helps make for a much bigger sound.

It is always good to have phase checkers and know your absolute phase because mics and preamps vary. [Editor's note: In spite of the IEC standard pin 2 hot, a lot of gear is still designed with pin 3 hot.] This can cause cancellations and loss of fidelity. When recording the overhead mics to tape on an analog machine I usually go straight across through Telefunken or API preamps. Compression sounds good, although I

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prefer to do it on the monitoring end with a UREI 1178 or two UREI 1176's.

When recording to a digital format I always print some compression to tape and mush it together before it gets turned into 0s and 1s. For this particular overhead technique, compression in the mix allows for a lot of flexibility in the amount of room sound being sucked in and the "splashy-ness" of the cymbals. When using very heavy compression I call it my "Ringo filter." The cymbals can be very loud but still warm and musical.

It is always interesting to solo the overheads and experiment with variations on mic height to find the optimum placement — which is ultimately affected by ceiling height. When the ideal spot is found, it can be quite amazing how good of an overall sound can be recorded with just the overhead and the kick mics alone.

MAKE ROOM FOR MIKING

The other area of focus I want to cover is room miking. Even though so much of this depends on the room size and characteristics, I have a technique that minimizes all of that. This application works well in

stereo or in mono with one mic. Large-diaphragm condensers are placed as close to the floor as possible, at a 45-degree angle pointing up towards the bottom of the kit. Distance should be at least six feet, but can go out to 16 feet if the room allows.

The secret is in finding the sweet spot. When using two mics, they should be three to four feet apart. Aim the capsules away from each other by about 120 degrees. You can experiment with both omni and cardioid patterns to see which works best in your room. The main reason that this odd arrangement works is because it increases bottom-end response, stays clear of middle-room boxiness, and makes for a very tight response to tape. Again, the same principles about compression apply just like the overheads. So have fun and magnetize those little particles!

Ray Kennedy is chairman of the board at Room And Board studio in Nashville. He has worked with artists including Steve Earle, The V-roys, Waylon Jennings and Willie Nelson, Bob Woodruff, and Willie DeVille.

HEAD FOR DRUMS

In addition to being a co-owner of The Money Pit recording studio in Nashville and one of that area's busiest session drummers, Eddie Bayers has worked on projects ranging from McDonald's commercials to the most recent Mark Knopfler CD. And because we here at EQ get many questions on drum miking, we asked Eddie to give us a bit of insight into getting good drum sounds even before the mics are involved.

If there's one thing you need to get good drum sounds, it's good-sounding drums! And obviously the choice of heads that you put on those drums is very important. Although head selection is not quite as sensitive as the type of wood used to make the drum, it is sensitive enough that any head you put on a drum — even heads of the same type — can give a different characteristic to the tone of the drum.

I have been using Remo heads for many years, the reason being that Remo is the guy that invented the plastic head (and has been innovating it ever since) and I know of their consistency. Even still, there are times when you could, for example, try two 12-inch coated Ambassador heads and they might sound different. But I'd have to say it's very minimal that this happens. While you're changing heads, make sure to tighten all the bolts that hold on the lugs and other fittings.

I did a lot of experimenting to try and find the best combination for the top and bottom heads. My latest for the toms is a clear Ambassador on the bottom and a coated Ambassador on the top. For snare, it's a coated Ambassador on top and an Ambassador snare on the bottom — that bottom head is just a regular, thin, snare-bottom head. On the kick I have been using a clear Remo Master Series head and, after testing a lot of different heads, it seems to be the one. The kick drum has a front head on it with a 10-inch hole cut out so that you can get packing or weights and a microphone in there and position them the way you want.

Believe it or not, I pack the kick drum with sandbags. The good thing about sandbags is that they are heavy and flexible at the same time. If you were using a packing blanket in the drum, you would get some movement and the tone of the drum would change. You can position a sandbag and it will stay where you put it even if you slam the drum.

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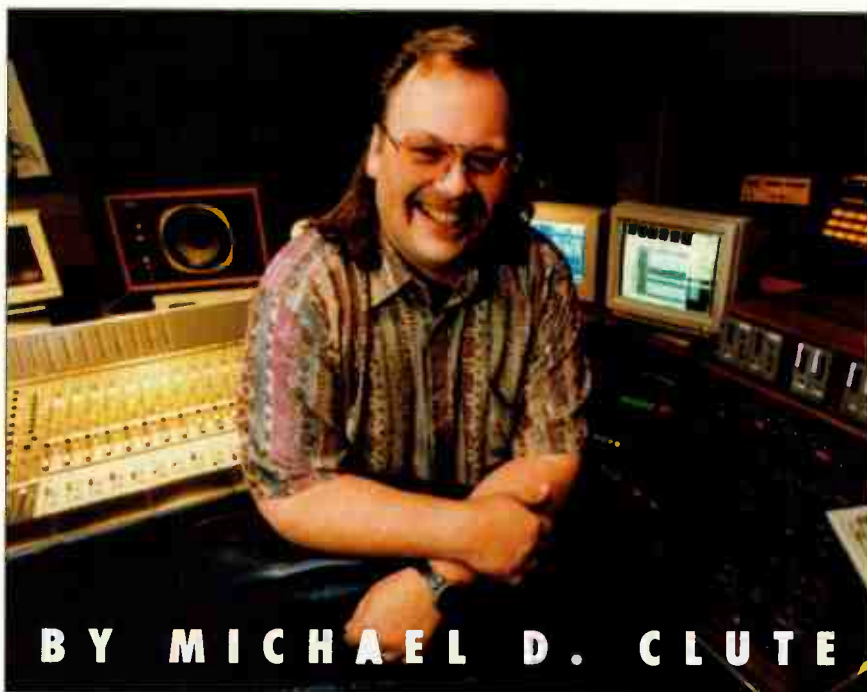
Not So "Hard". Disk Recording

Tips from Music Row: Why you should give hard-disk recording a chance

I'VE BEEN asked why I decided to stop using tape-based multitrack recorders and switch to hard-disk systems. This is a very good question. In fact, it is the very same one my wife asked me since I own an Otari MTR-100 24-track analog machine with Dolby SR and an Otari DTR-900 32-track digital. I think the answer I gave my wife was a pretty lame: "Cause I...ah...need it!" But after using my Fairlight MFX-3 and Otari RADAR hard-disk systems

for over a year now, I can definitely improve my answer. As a producer, studio owner (maybe studio *owe'er* is more accurate), musician, and engineer, I see definite benefits to hard-disk recording from several perspectives. And, yeah, it's just plain cool to use, too.

One of my favorite descriptions of



BY MICHAEL D. CLUTE

a producer was something I heard Quincy Jones say — that the primary function of a producer was to be the artist's first audience. The implication of that is helpful in many ways to creating a great recording, but you probably don't think using hard disks is one of them. But let me expound...

An audience reacts to and supports an artist's performance, but doesn't limit it. Several aspects of hard-disk recording apply in this regard. The first is speed: practically no rewind time, no changing reels every four to six takes (I have 12 GB of hard-disk space for my system), easy splicing of different 24-track takes to compile a master in minutes, and the ability to quickly and accurately comp and/or fly parts between or within takes.

The next advantage is one of minimizing limitations: unlimited tracks due to the ability to layer tracks without erasing the prior recording, the ability to correct minor timing or performance errors without endangering the integrity of the original performance, and the freedom for both the artist and the engineer

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to experiment with arrangements or performances without the fear of losing what is already there.

My last point from the producer's perspective is budget. Having worked with acts ranging from multiplatinum-selling artists to ones who flip burgers to finance their career, they all have one thing in common: a budget. Tape costs, studio rates, and time spent in studio are all lowered using hard-disk systems. This is a very good thing unless you really enjoy those phone calls from the business affairs office.

THE BOTTOM LINE

I already mentioned recording budgets, and, if you haven't noticed, they don't exactly have a cost-of-living increase or adjustment for inflation built into them. Over the years I've been making records, budgets haven't changed and may even be lower in some cases due in part to the increased competition and quality of project studios. The 48-track machine has practically become the standard at the top end of the industry, and to compete you have to ante up about \$200,000. Or maybe not.

An Otari RADAR 48-track system will run you about 50 grand. A Fairlight MFX-3 24-track with a Fairlight Digital Dubber 24-track (essentially a 24-in, 48-out system with waveform editing, a ton of DSP power, including EQ, time compression, pitch change, cross fades, level, and gating just to mention a few) will run a little over 80 grand. Either way, it's a huge savings. And both systems kick butt functionally and (in my opinion) sonically compared to any tape-based machine. There is the perception of a large learning curve required to use a hard-disk system. Nay, nay, I say. If you can run a normal multitrack remote, the Otari RADAR literally takes an extra 10 minutes to learn. And the Fairlight doesn't require much beyond that unless you get into more intense editing and DSP functions.

MUSIC TO MY EARS

What are we really trying to do in the studio? Besides basking in the glamour of the music industry and impressing the opposite sex, we are probably doing

our best to capture a great performance to be enjoyed for years. So how do hard-disk systems affect musicians?

One way is by freeing up players to "go for it" during tracking without needing to be nearly as cautious since it's easy to use the most inspired parts from multiple takes to quickly compile a master performance. This may not be as necessary if you are using the "A" team session players, but if you work with bands that actually perform on their own record like I do (and you'd be surprised at how many don't), it can make an incredible difference. Being able to let a guitarist take as many shots at the solo as he wants without having to erase a single performance is a very



HARD (DISK) WORKIN' MAN: Mike gets to work on the Fairlight system.

liberating feature for the player — just ask one sometime!

The same thing applies for the vocalist. Besides the fact that their headphone mix stays the same without repatching, they can keep working on an idea without all the "dead air" caused by rewind time. And there is the ability to comp performances with the accuracy of a surgeon. I can also fix that late kick drum, pitch correct that third note of the 64th-note triplet in the guitar solo, slide the acoustic back to the beat, and (don't tell anyone) I can pitch correct that lead vocal in the bridge.

IT'S TOOL TIME

If I were a carpenter (and you were a lady...sorry I couldn't resist), I would use the best tools to do the best job I could. The same is true of an engineer. First of all, both of these systems are sonically

killer. They are quieter and have better specs than my tape machines, so even if they only had basic tape deck functions, I would prefer them. It seems the analog/digital debate never ends, but I would rather have the lower noise floor and the knowledge that my recording will sound the same in six months as it does the first time I listen back to it (garbage in, garbage out...but it's my garbage).

Another thing about a new tool is that you learn to do things you weren't able to do before or learn to do what you did before quicker or better. Let's see, where do I start? Nondestructive editing is a good place. Besides literally saving hours, if it bites, just undo it. How about flying chorus vocals around? I can finish an entire

song before you get the sampler plugged in and the levels set. Anybody love sibilance or "p" pops out there? Just find the "s" or "p" in the waveform and turn it down or EQ the little culprit. Done. And the singer doesn't sound like they have a speech impediment throughout the whole song.

Maybe you have done 24-track punches on a tracking date (one of my least favorite things): set that auto-punch, rehearse it at least once, cross your fingers, let 'er rip, and hope the musicians play the same phrasing. With hard disk, just punch early or set it for a little prerecord handle and go for it. If you or the band blows it, undo it. Say the crash cymbal is decaying over the punch — just slide the edit point on the tracks that didn't have a clean punch-in point to an earlier or later one. Slick!

Ever had a vocalist who is a little dull-sounding in the verse but when they punch out the high lines in the chorus they are so ripping your teeth hurt? Well this can be dealt with by EQing the dull parts with a little top-end boost and making an upper-mid cut on the brash phrases, or even just the offensive word. I feel that a large part of the craft of engineering is being able to keep problems from happening, but if they do, you have to deal with them in such a way that they actually enhance the final product.

NOTHING UP MY SLEEVES

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Fairlight MFX-3, but they may also work with other systems.

The "perfect" gate: Not that it ever happens with my tracks (ha ha), but let's say you have tom tracks with as much cymbal as tom on them (this also works for a snare track with too much hat on it). Copy the original track to an open track and use the gate function with a one-frame handle in front of the tom (or snare) "hit." The Fairlight will create a track of separate "clips" — little blocks of audio with silence in between the events. Then go to the original track and turn its level down 9 to 12 dB. Copy the gated "clip" track on top of the original and write cross fades at the front and tail of the "clips." You now have

a tom track with all the attack on the hits and four times the 'tom-sound-to-bleed ratio' without losing the ambience!

Now, for "big" kicks and snares. I like acoustic drums: the ambience, the feel, the tone, and so on. But when it comes time to mix, I may want to alter the sound. Maybe I want more strainer on the snare, a longer decay to the kick, or maybe I want to add some ringing to the snare (layering sounds like a keyboard player does with a rack of synths). Totally replacing sounds is a breeze (although a little sterile) and can be done with a lot of devices. Just trigger a sound and offset it for the trigger delay, MIDI delay, and so on. But if you want to combine that sound with your original

track, you'll find that your sound is changing (or flaming) on practically every hit. Use a sequencer locked to SMPTE and it's even worse (plus have fun with the offset). Because the slope of the transient is not identical on every hit, it effects the trigger point. Then there's the accuracy of the trigger device's gate, and anything chasing SMPTE has a small amount of jitter as it keeps itself locked and corrects its position.

You say, "Mike, what do I do?" Again, use the gate function. Copy the original audio and gate the copy with a one-frame handle in front of the "hit." Then record in the sound you want to add to the original. Next, line up the transients of the two sounds and trim the front of the new sound to have the same one-frame handle as the gated original. Write a macro to jump from clip to clip, and paste the new sound over the gated clip. Then either write in the dynamics or run the track through an envelope follower to follow the original track's dynamics. Bring the new track up on another fader or digitally bounce them together in the right combination onto a single track.

One last tip: Save your effects for other stuff and use the hard disk to double parts, pitch shift/chorus vocals, or for dramatic echoes. I'm sure you'll think of more.

SAY UNCLE

By now you may gather that I'm sold on hard disk, but I should add a few more thoughts. I am not a fan of most PC- or Mac-based systems. A single-screen interface is where it's at (forget a ton of windows) and a dedicated controller is mandatory (hit a button, do a function). In my experience, dedicated systems such as those from Fairlight and Otari have been much more solid, faster to use, quicker to learn, and dependable. And Roger Nichols is right, get a master clock for the whole studio (atomic, buddy!).

Remember, we are making music and the song is the heart of it. Most of the time, what you don't do is often more important than what you do. This is the evolution (not revolution) of a tool. You might be able to build a house with a Swiss army knife, but then again we're not all McGyver!

In addition to being a studio owe'er, Mike Clute is a producer, engineer, and musician based at Midtown Tone And Volume in Nashville, TN. He has worked with acts such as Diamond Rio, BlackHawk, Duane Steele and Royal Wade Kaimes. He recently produced Diamond Rio's Grammy-nominated IV album (completely on hard disk, of course).

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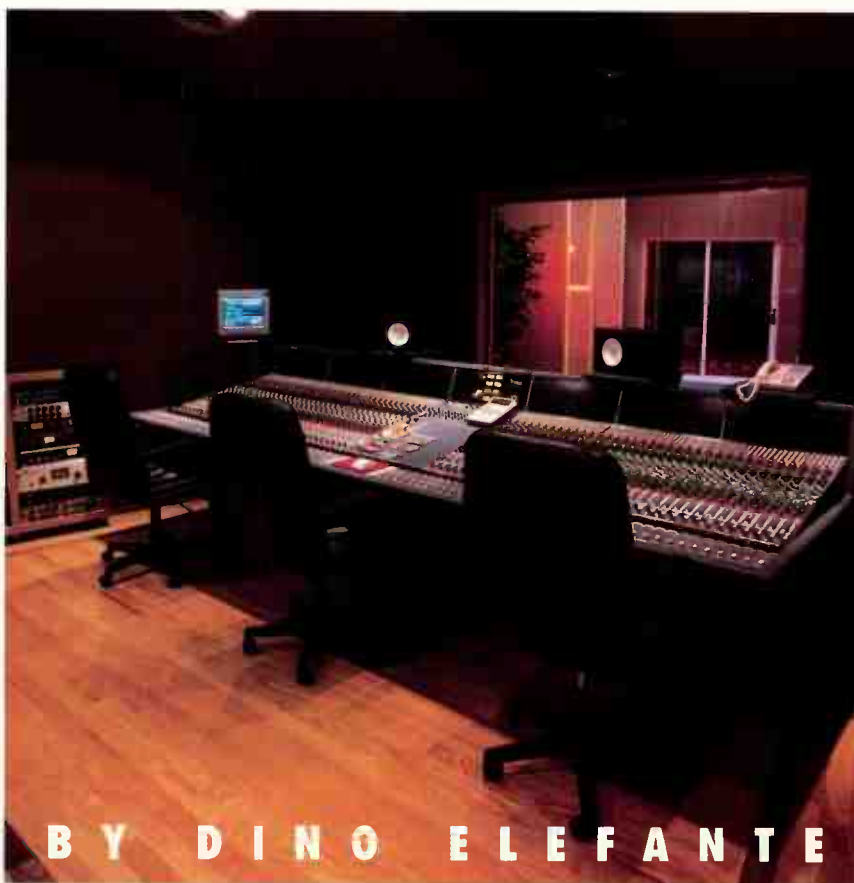


Eastward Ho

*Making the move
from Los Angeles to Nashville*

RELOCATING YOUR FAMILY and business from California all the way to Nashville, TN is quite a move — not only physically, but also in terms of a way of life. When we were out in California, my brother John and I were producing between seven and ten records a year, and more than half of our clients were Nashville-based. We were working with bands like Guardian, Petra, and Greg Long, and my brother was also signed to a Nashville-based company.

Doing as much gospel work as we were in California, we felt very isolated because most of the record companies we were dealing with were down in Nashville. So we came here wanting to have access to the musicians and wanting to have a closer creative collaboration with the record companies. That's



BY DINO ELEFANTE

what triggered our interest in Nashville. When we actually came and saw what it would be like to raise children here, have a family, and exist in an everyday atmosphere, it became more and more attractive. Plus we felt like there was still ground-floor oppor-

tunity and there really wasn't anymore ground-floor opportunity in California for our industry.

There is tremendous growth in Nashville right now and lot of people are coming here expecting to find work. But unless people bring work with them — which creates opportunity for the entire community — then it just makes life harder for the people already here in good standing. We were welcomed with open arms by the Nashville community, but we also came here to make an investment in that community. We did not come to the area to set up shop and steal other people's gigs, and that is an important aspect of the relocation process.

MOVIN' ON DOWN

The physical logistics of the move were absolutely overwhelming. We moved five

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families, sold six houses, and brought out five 72-foot transport semi's full of recording equipment, furniture, and personal effects. We uprooted two 2500-square-foot studios! Do you realize how much junk accumulates in a studio? There's gear, mics and stands, pictures, refrigerators, couches, and even wiring. It sounds easy — like you just pick up the board and the machine and go, but I'll never forget one day when I was helping load the van line from my house. I was so weary from packing and helping the movers direct what goes where that I started handing bricks to those guys to put into the moving van — common little bricks. And finally one guy turned to me and said "Hey, you can't get these in Nashville?" I was so weary from doing nothing but packing and moving for seven weeks that I wasn't thinking clearly.

In California, John and I were mainly producing a lot of projects, some of which I mentioned earlier. The studio was used probably 80 percent for us to produce records and 20 percent as a commercial venture. That ratio has been flopped here at Sound Kitchen. We have two rooms, both with Neve consoles (in an otherwise SSL-filled region), and we are building three more to meet the demand.

The interesting thing is that it's not just country acts. My brother and I were bumped this week for Barry Manilow. Recently, we have had Michael McDonald and even Julio Iglesias here, and often find ourselves having to book studio time elsewhere. As a result we're building a 60-by-65-foot tracking room and two resident production suites, one of which will be occupied 100 percent by Michael Omartian.

What I find here that is much different from California is that producers will start a new project while finishing another. So now we are looking to provide a facility for producers where they can actually do their programming and overdubbing across the alley from the three main studios. A guy like Michael Omartian could walk across the alley, check on how a mix is going, walk back to his production room, and continue to work on something else. In California, this just didn't happen because the proximity was so different — everybody was so spread out. In Nashville, we are all within about 25 minutes of each other. At a multiroom facility, it's exciting and stimulating when there's five or six producers and engineers, all the rooms are pumping, and there's a lot of music going on. People are conversing in the lounge and trading ideas, and it's a place that people want to hang out.

Nashville records are being made differently than records in California.

We have three major genres: pop, which is growing; country, which is dominant; and gospel, which is just under dominant. (There's probably more records being put out in the gospel genre, but at a lower budget.) Due to this, the studios run differently and are outfitted differently. I remember running into (drummer) Mike Baird one time and he said, "Hey — 90 percent of my work is coming in and doing cymbal overdubs." Everybody was programming drums and bass either on Fairlight or on a sequencer. That was six or seven years ago and then everything came back to live. Suddenly nobody could facilitate a rhythm section in a house in L.A. or didn't have the live room for a real drum kit. Down here, the records are cut live and there's about 20 studio musicians making the majority of the records.

GET A CUE

Technically speaking, I had never heard of a Cue 8 system until I came here. This is one of those cue systems whereby every musician can do his own mix. The engineer feeds subgroups of instruments out to the musicians in the studio and each musician has his own small mixer for the headphone mix. We cannot work without that system here, but in California, John and I were the studio's biggest client and we didn't need it — so we didn't have it. In Nashville, this system is essential because the players need to get on to the next session, and everybody records at once. We didn't even have an iso booth in California because we didn't need it, but our newest room at the Sound Kitchen is going to have six: a vocal iso, grand piano iso, and four more 10 x 13 isos, plus a main room as well.

We're building a rock and roll room — very ambient — because a lot of the rooms that exist here are nonambient. In one of our big rooms we have curtains (which open and shut) and behind those curtains are 21-foot floor-to-ceiling mirrors so you can liven the room way up. For a lot of sessions they are shut, but when the pop and rock sessions come in, we even roll up the carpets.

LOUNGING AROUND

Interestingly, one of the most important aspects of the studio is the lounge. You have to have a comfortable place for people to hang out. The way a lot of the sessions run is that everybody records their tracks and the producer finds one take comfortable for all of the musicians. Then each musician comes in to do their fixes. This is usually about a two-hour process, so we've put in satellite dishes and cappuccino makers — very elabo-

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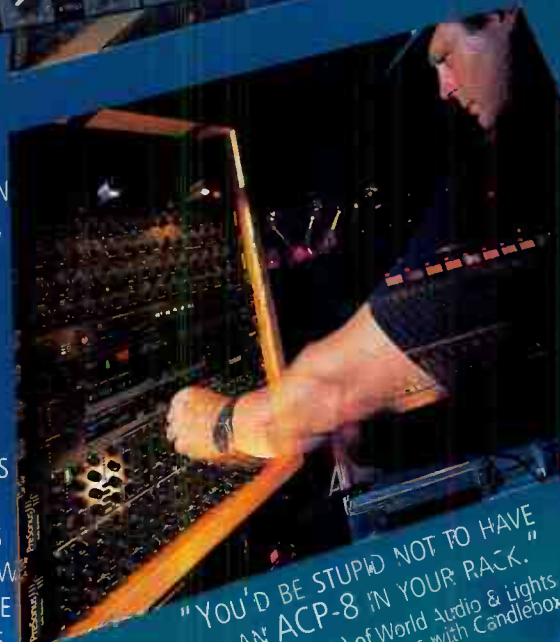
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rate things — to keep musicians happy and comfortable while they are waiting. We work very hard on our hospitality. In fact, my parents — having been in the restaurant business — cook some amazing seven-course Italian meals. We feed clients like Michael McDonald and Julio Iglesias and they flip out.

These are not the kind of sessions where you are tracking the rhythm section to keep just the bass and drums. You are going for keeper parts on all of the instruments and a lot of times I have seen scratch vocals end up on records. As a result, we also need to have a more substantial investment in equipment. We have two 32-track digital machines, two 24-track analogs, a 48-track, 1/2-inch Sony digital, DAT, analog 2-tracks, and PCM9000 MO recorders to mix down to, and tons of outboard gear. Each room has two dedicated racks with a couple of GML EQs, some UREI LA2A's and 1176's, and Focusrite EQs — pretty elaborately supplied rooms.

To accommodate sessions like this, you need bigger consoles, more inputs on the mic panels, and the ability to access different things on mic panels such as SMPTE, speaker leads, and line-level leads. We'll track vocals in the control room and the vocalist has a choice of monitoring either through the speakers or through headphones. If need be, we can use portable baffles, eight feet high with windows in them, to actually build a little iso room in the control room. And having that variety of gear works to our favor. I have noticed that a lot of producers are going back to analog tape again. We are currently doing a Michael McDonald album, some of which was recorded on a 25-year old (MCI) JH16 analog 2-inch. The bass, drums, and vocals were recorded on the JH and then transferred to Sony 48-track digital for additional overdubs.

Here's another interesting thing I have found: most of the producers in the area are on staff at a record label, either in the capacity of A&R or in some cases vice-presidents like Mark Wright and Emory Gordy Jr. They can't leave Music Row because they have a certain responsibility to the record company as well as their responsibilities as a producer. Since they have to get back to their offices, they do not want to start traveling too far. We came up with an interesting idea to help them with that problem. We've just installed ISDN lines and we have a digital transmitter. This allows us to install a box in anybody's office and they can hear the mixes from there without leaving their office. So it's like our ad for Sound Kitchen says: "Now you can be in our Kitchen without leaving your living room. But too bad you didn't get to taste the sauce."

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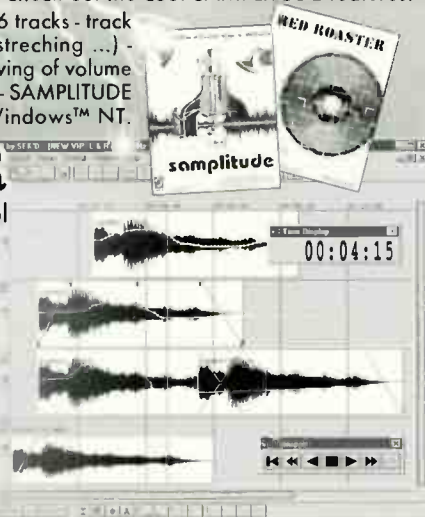
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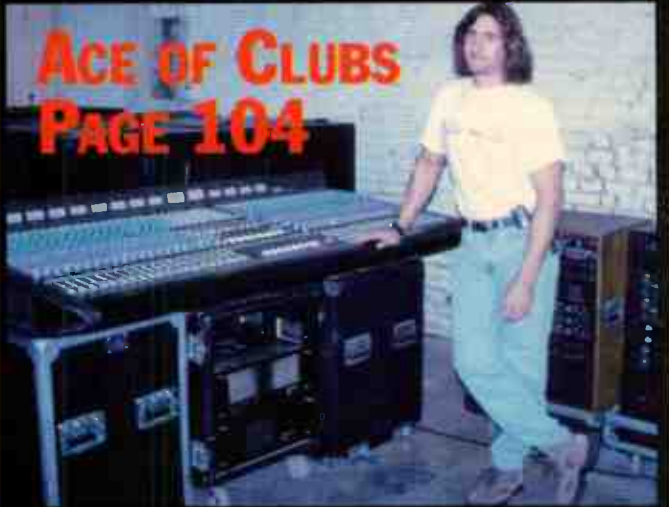
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DOUBLE TROUBLE ON THE ROAD

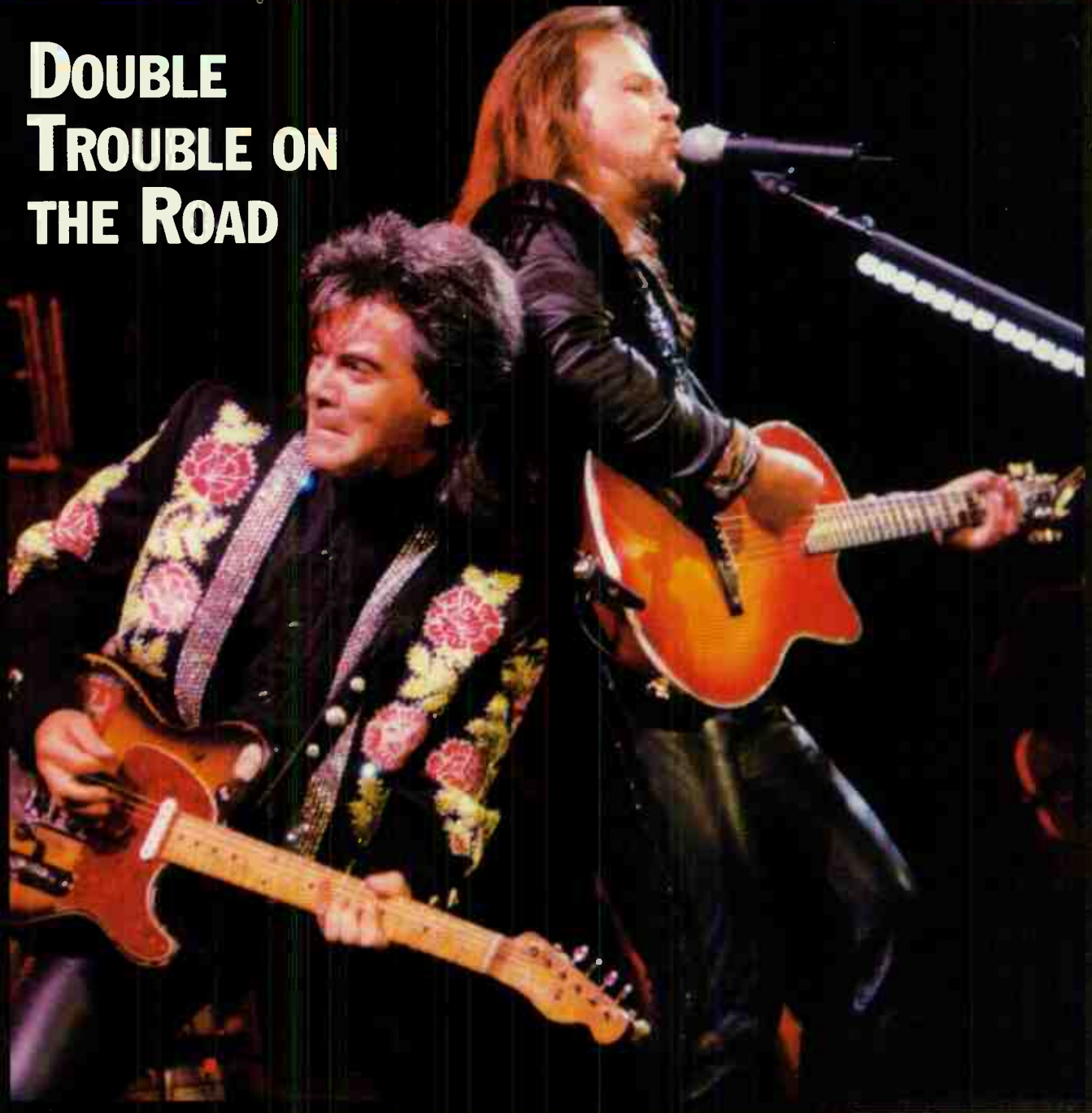
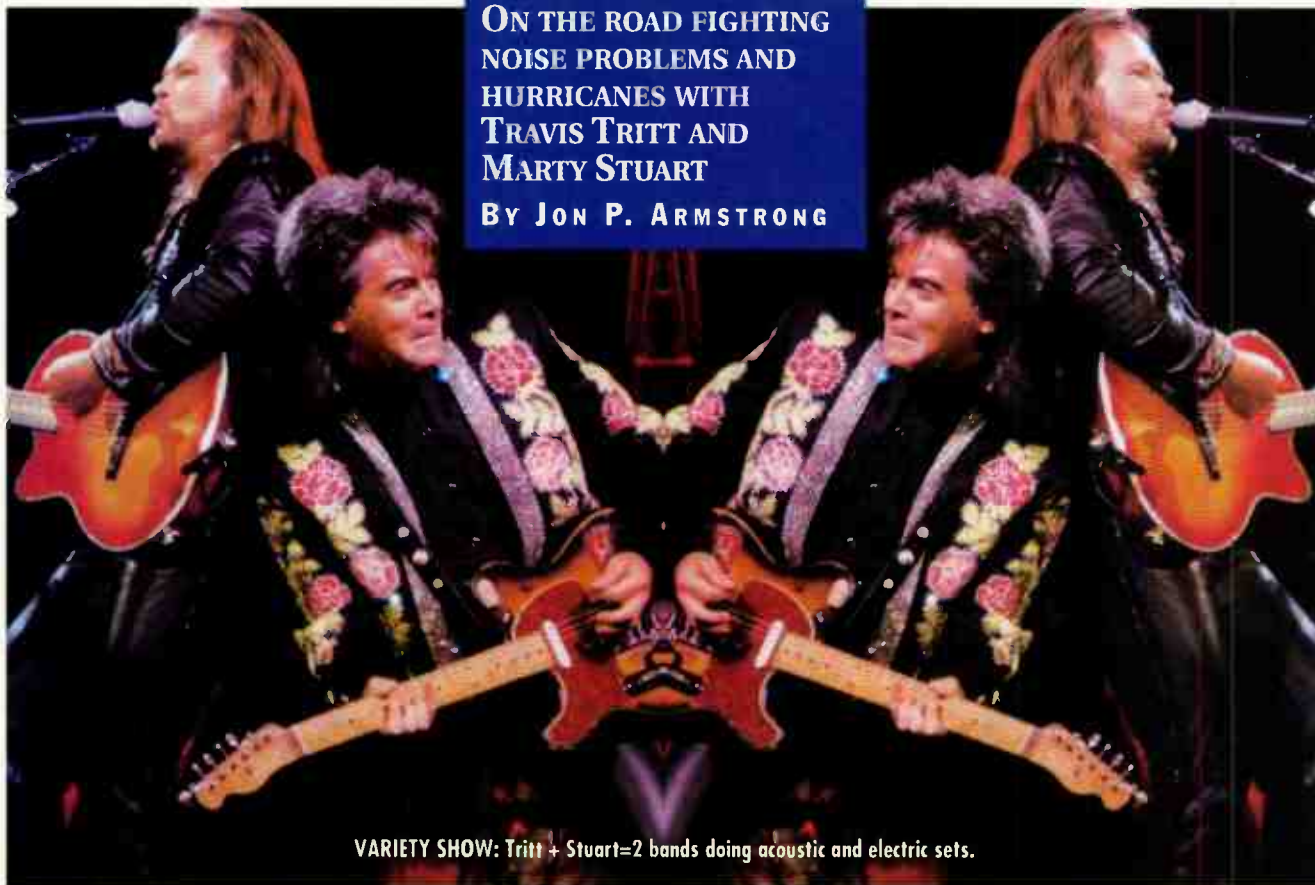


Photo by Mills Fitzner

TOUR DIARY: DOUBLE TROUBLE '96

ON THE ROAD FIGHTING NOISE PROBLEMS AND HURRICANES WITH TRAVIS TRITT AND MARTY STUART

BY JON P. ARMSTRONG



VARIETY SHOW: Tritt + Stuart=2 bands doing acoustic and electric sets.

Last summer, EQ spoke with engineer Jon P. Armstrong regarding the Travis Tritt tour. Well, Tritt is at it again. This time on a co-headline tour with Marty Stuart, and Armstrong has once again been called on to mix monitors. Since it is a co-headline, there are quite a few set changes — each show includes an electric set by each artist individually (during which members of the other act make guest appearances), an acoustic set with both of them, and then a final set where members of both bands play together. The nature of the show requires that any audio channel be ready to go at any time — and that applies to monitor land as well as front-of-house. In this article, Jon takes us through “three days in the life” of the Double Trouble '96 tour.

DAY ONE: WALLINGFORD, CT/JULY 12, 1996

“There is absolutely no way that we’ll get any rain tonight,” John Boy smiled wide and looked suspiciously confident. “The weather channel says this stuff is a separate system and Bertha won’t get here ‘til tomorrow morning.” As stage manager, it’s his job to help me believe that fantasy. “No worries Mr. Chapman,” I said. We’d been running ahead of this hurricane since we left Nashville and everybody was already set before this particular round of showers hit. The RARoth Lighting (Atlanta, GA) crew made plastic booties for the truss spots and the ever-present wiggly-lights they’d flown. Their trussing was left in the truck, as they were augmenting the three-truss rig

that was already at the venue. There wasn’t anywhere to hang their mid-stage drape (which hides a set change), however, so we knew that morning we’d be scratching the acoustic set.

There were local vendor’s racks and stacks ready with tarps piled behind them, some kind of Martin system. We didn’t have an opener that day, and we had some time we could squeeze out of the bands. Travis’s house guy, Jon Suskin, said the rig sounded okay. The monitor rig was the Clair system we carry with us, so we decided to relax and wait out the rain for a half hour.

The tent we’d requested for monitor world turned out to be a lean-to-type tarp stretched through the scaffolding that supported the

roof over the stage. We crammed our two Yamaha PM4000m’s between the scaffolds, but that tarp was more for shade than shelter. Usually those outdoor dates find me and Marty’s monitor guy (and Clair guy) Brent Carpenter mixing under a tent we’ve prepped with plastic walls. This just isn’t practical in scaffolding, however. We had to cover all the monitor gear with separate pieces of plastic sheeting. In order to be able to set up scenes and send audio signals back and forth between the two monitor consoles when Travis and Marty guest in each other’s sets, we chain the console mutes and VGAs together. The PM4000m’s are great with their linking and routing capabilities, but it takes

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World Radio History

CIRCLE 87 ON FREE INFO CARD

a bunch o'plastic to cover two of them (not to mention the processing racks and the ear-monitor equipment).

Clair's crew chief Joe Ravich had the FOH pair of '4000's similarly wrapped. At about 4:30, the sun came out and John Boy declared the rain over. We carefully uncovered everything and went about our abbreviated sound-checks. By 6 PM we'd covered

all the gear again and gone for dinner. I ate mine on a road case while watching the sun set into a massive cloudbank. The bank rolled in while the show started and everyone knew it was coming. Marty's rockabilly riot went well with the wind picking up and darkness falling quickly. The crowd was rowdy and in the hooting mode — usual for that point in the show.

The acoustic set normally starts as soon as Marty's Rock-n-Roll Cowboys stop the vamp that ends their set. The missing mid-stage drape would hide the set change while Marty, Travis, and Jon Bonnett and Wendell Cox (from Travis's Country Club Band) play downstage. Instead there was a 15-minute change while we set Travis's stage. (The acoustic set is 15

minutes long, so the set change is a snap when they don't have to do it quietly in the dark.) Fifteen minutes was also just enough time for the clouds to brew into a full storm. Clair's other stage guy, Mark Gould, was scooting one of the Clair P-2's we use for sidefills when a kid in the audience asked, "What happens if it rains?" "You get wet," he said. And wet they did get.

Ten minutes into the set the rain was dumping on the crowd so hard they gave up on staying dry. There was concern for everyone's well being, but standard operating procedure dictates we play until we see lightning. Travis was getting wet as well. Production manager (and tour rigger) Ralph Perkins asked, "Is he okay out there?" "He's as safe as any of us on this gigantic lightning rod," I said pointing to the scaffolding, "if not, more so. None of his stuff will explode." Travis uses wireless FutureSonic's AEM's® and the groovy new Shure UHF wireless for vocals (which kept working even though it was drenched with rain). Bud Phillips (Travis's guitar tech) uses Nady 950GS wireless units for all of Travis's guitars. Travis was totally wire-free and the band was staying (mostly) dry — so they played right on through the downpour.

The rain let up and let loose several times before the first lightning was spotted miles away. Travis got the high-sign and gave the band the "last song" signal they'd been expecting. The set was a little over an hour. After 50 minutes of continuous rain, the only casualty we suffered was the drum sampler getting a bath. But that happened late during load-out and it had had a long, full life anyway.

DAY TWO: COLUMBUS, OH/AUGUST 7, 1996

I was standing on top of my toolbox lid so I could see downstage. This room was

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Magazine,
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CIRCLE 80 ON FREE INFO CARD

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odd — a long hall with the 7-foot tall stage running down the side. It was quite unexpected, but welcome for us to find an arena on this run. The previous few shows had been bearable but the local vendor PA's were sufficient at best. Both Suskin and Marty's FOH guy, Les Banks, were wrestling every usable decibel they could from the provided systems. This day promised to be

more of the same. Brent and I have different banks of EQ presets in the TC Electronic 1128 system to handle the monitor changes from indoors to out — one button and you're roughed in. Unfortunately, without a soundcheck, one can't really prepare for the way the stage sounds when the PA gets to running volume, especially if you've not been inside lately. Guesswork aside,

the sound crew was anxious to make noise.

The 60-foot traveler track that hangs the drape was rigged and the acoustic set was green-lighted. We set about soundchecks as usual with Marty's gear in place — a 95-input line check, then the Country Club band followed by Marty and the Cowboys. The only real gremlin we had

was a buzz in the video feed to drummer George Stalling's drum rack (George follows a track to sync the band to video during the Travis set). We eventually realized the video rack was normally AC ground-lifted at its home on stage right. The hall couldn't accommodate the video trussing, however, so Chris Hobbs (Tritt's video tech) set up on stage left near the house video gear he was feeding instead. Five minutes and a 49-cent AC adapter later, and we were eating dinner.

The show that night went fairly well. What the audience didn't hear was the mush we got on stage during the acoustic set. Jon and Wendell needed more volume than usual, and their live wedges began to wash out Travis's and Marty's Ear Monitor mix. While the set change in the dark behind the drape was a little slow, nobody seemed to notice.

DAY THREE: MERRILLVILLE, IN/AUGUST 24

Finally, another chance to do the acoustic set. We'd done a string of shows without the acoustic set. In fact, for this particular run of shows we'd left the rigging truck in Georgia and the drape with it. Theaters, however, are historically known to have drapes in them; this one didn't disappoint. The local lighting rig went in at 8 AM. Soundchecks were scheduled for 2:30 and our load-in was slated for 9 o'clock. But the venue had only a one-truck dock and no storage to speak of, so everyone emptied boxes and packed them away tight.

Space was tight on stage as well, so much that Tritt carpenter Tony Downs had to build his 4-ton hydraulic stage only two feet from the upstage wall of the theater. The set change normally starts with the drape closing and the set rising to

continued on page 142

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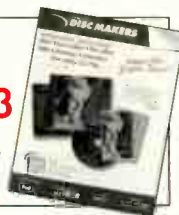
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CIRCLE 08 ON FREE INFO CARD
World Radio History

CLUB PROFILE: ACE OF CLUBS

**HOW THIS CLUB DOES
DOUBLE DUTY IN
MUSIC CITY USA**

BY STEVE LA CERRA

IN THE TOWN that has affectionately become known as "Music City USA" you'd expect to find some pretty hip clubs. And since Nashville is the center of the country music universe, you might also expect that a majority of these clubs would be host to predominantly country acts. What you might not expect to find is a place like the Ace Of Clubs, which, in addition to being one of the favorite local stops for up-and-coming and national country acts, also runs shows with just about any kind of music you might imagine. Guest artists at the near-500-capacity room range from bluegrass acts like the Cluster Pluckers to Tower Of Power to borderline metal bands.

THE ACE'S SPACE

Ace of Clubs is in a concrete



DOUBLE DUTY: Is the Ace of Clubs a live-band club or a dance hall? It's both.

block building that used to be a warehouse. The room is roughly 115 feet long by 40 feet wide. At one end of the club is the stage, measuring 24-feet across and 16-feet deep. Along either length of the room runs a balcony

that is 12-feet deep. Unlike many single-room clubs, the Ace Of Clubs runs live entertainment Monday or Tuesday through Thursday nights (depending upon how busy the season is). Then on Friday and Saturday

nights, it turns into a retro-dance hall, with a DJ playing music from the 1970s and early '80s (the club is closed on Sundays). An interesting aspect of the club is that instead of having separate PA systems for the stage and DJ (as is often the case), output from the DJ system is fed into the house PA. Services, Inc. (Nashville, TN) designed and installed the front-of-house system and describes the speaker cabinets used for the mains: "We use a proprietary box that is the same box we use for all of our shows. It's a front-loaded trapezoidal box 42-inches wide by 42-inches high by 22-inches deep. Each box has a pair of RCF 15-inch woofers, a pair of RCF 12-inch drivers, and a Peavey CH4 horn on a Peavey 44T driver. At each side of the stage is one of these boxes (flown), and a sub box with two Peavey 18's in each. The sub boxes — which sit on the floor — have the same footprint as the full-range boxes, but are 46-inches tall.



ACE OF TECHS: Engineer Mark Phaneuf stands at the Club's PA system.

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SOUNDING OFF
Jim Wakefield
of Production

"The system is four-way mono, all Crest powered and crossed over with a Peavey PC4XL. We use a 7001 for the low end and low-mids, and a 4801 for high mids and highs. The boxes are not very big, but they can play loud and get

Photos by Lisa Roy

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OFF TO THE RACK: The racks can be switched between FOH and monitor land.

the system up to around 110 dB." In the previous install, the entire PA was sitting on the floor, but Jim observed that as soon as the club filled up with people, the bodies blocked the PA and the low-mids disappeared. By flying the full-range boxes, the problem was averted and the coverage of those boxes negates the need for any additional fill speakers towards the rear of the room.

For the house console, Wakefield installed a 32-channel Soundcraft Spirit. Monitor mixes are done from the house mix position so he has set up the Spirit with four prefader sends for monitor and two postfader sends for effects. At the house position are five 31-band equalizers: a Klark-Teknik DN30 for the house and four Peavey EQ31's for the monitor mixes. House effects are a Roland SDE1000, two Yamaha SPX90 II's, four channels of Symetrix gates, and four Symetrix compressors. Also available is a dbx 160x for compressing the house (more on that later).

The Peavey EQs are in a separate rack that can easily be moved to the stage when an act wishes to bring in a monitor console. Jim notes that for engineers familiar with the room, the monitor situation isn't a problem, but it can sometimes be

when a guest engineer comes in who is not used to this type of setup. "Where four mixes are enough but the engineer really doesn't want to do monitors from the house, we can bring in a small console like a Yamaha 2408 or a Peavey Mark IV, put it in as a monitor board and be able to mix from the stage area. This gives the band the diversity of having another engineer to handle monitors, but won't run the cost up a great deal. For 80 percent of the bands that come in, four mixes from front-of-house is fine."

Monitors include three Maryland Sound wedges up front (JBL-loaded with two 12's and a 2-inch horn) and a Maryland Sound drum-fill box with two 15's and a horn (also JBL-loaded). All monitor mixes are biamped (crossover is at 1.2 kHz) with SAE power amps on the low end and Peavey M4000's on the highs. Anticipating the fact that some acts would request different or additional equipment, Wakefield installed a 24-channel snake with a permanent split for a monitor console. The wedges and power amps are already there, so connecting a monitor desk is as easy as patching in the monitor output of the split.

In addition to monitor rigs, some acts bring in their own console or request

something bigger than the Spirit, in which case Jim can offer a Yamaha PM3000 or a Crest GT (both 40 inputs) or an eight-mix monitor rig. On occasions where more house speakers are required, the system is doubled up, but Wakefield warns that if the SPL gets much over 110 dB, "it is just too loud and the bar will not do much business. But there are shows where the idea is not doing bar business, it's just putting a band in and selling tickets. But we're prepared to bring any gear in or out needed to make a show happen." With that in mind, the available mic selection includes Shure SM57's, SM58's and SM98's, a Sennheiser MD 421, AKG C451's, and ProCo and Countryman DI's.

HOUSE OF CARDS

The PA at Ace Of Clubs really is under a rigorous schedule. In addition to the live shows and the weekend DJ thing, the club is used by acts for label showcases as well. "We do 50 to 60 label showcases a year there," explains Wakefield, "so the PA runs quite a bit. This rig has been in there for almost four years, and in that time I have replaced one 15-inch driver and one 18-inch driver."

What is the secret to keeping it in such good condition? Tests and maintenance. Jim periodically checks the system for weaknesses before they become problems. He will bypass the crossovers and access the amplifiers directly, feeding a sweep tone through the drivers and listening for rattles, cones rubbing, loose screws, etc. Peavey's crossover has a limiter built-in for each band and has been carefully adjusted by the engineer to avoid problems. "We have the lim-

iters set right at the maximum output of the amplifier, before the amp starts to clip. Basically, I don't care what someone does with the dbx compressor at front-of-house. It is there as a convenience for compression, if they wish. It is not a protection device — protection is at the crossover. There is no input limiting at the crossover but there is output limiting and it is set right at the point where the amps will cease delivering clean power. So we don't have to worry about damage done by driving the amps into clipping. The only problem we could have is if an engineer drives the console into the ground on an input and produces DC, but that just doesn't happen down here."

MIX TIPS

Wakefield offers this advice to engineers mixing in the room for the first time: "Frankly, this is a really nice-sounding room just the way it is. You need to remember that the room is brick and concrete block and is not all that large. So it's a loud room, and there is a great deal of stage volume. If you have a guitar player using an amp with any kind of stage volume at all, you probably won't put a lot of guitar in the PA. It's just not a necessity. Everybody in the room will already be well aware that there is guitar there. The room is small enough that the monitors feed the front-of-house and the front-of-house system feeds the monitors. After you get to a certain volume level, it just becomes a wall and nothing is going to cut through there. So you need to keep the volume level under control, starting at the stage."

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TOA SL Series

enclosures with interlocking corner guards and steel mesh grilles, TOA Electronics, Inc.'s SL Series loudspeaker systems are operable between 70 Hz and 20 kHz. Each of the 8-ohm enclosures houses a 90° x 40° constant directivity horn coupled with a piezo driver at the high end. Low frequencies are passively directed to either a 12-inch (models SL-122 and SL-122M) or 15-inch (models SL-152 and SL-152M) transducer. Power handling for each model is rated at 240 watts RMS continuous program. Two parallel 1/4-inch phone jacks located on the rear panel of each SL loudspeaker facilitate multiple hook-ups. The line's two stackable models (SL-122 and SL-152) have suggested retail prices of \$414 and \$494, respectively. The floor monitors (models

SL-122M and SL-152M) list at \$446 and \$530. For more information, contact TOA Electronics, Inc., 601 Gateway Boulevard, Suite 300, South San Francisco, CA 94080. Tel: 415-588-2538. Circle EQ free lit. #120.

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Crest LMx

buttons on the corresponding output modules. The LMx's output section is comprised of ten dual Group Output modules and one Stereo L/R Output module. Each of the Group Output modules incorporates a dedicated stereo EQ section with three overlapping swept bands, sweepable

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Bag End Quartz

Loudspeaker Systems, P.O. Box 488, Barrington, IL 60011. Tel: 847-382-4550. Circle EQ free lit. #122.

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Martin Audio WSX



EMOTIONAL THING

AKG Acoustics' Emotion Series has been designed specifically for live performance applications and will initially consist of two models — the D770 dynamic cardioid instrument and vocal microphone (\$90 suggested retail price) and the D880 vocal super cardioid microphone (\$99). Additional products in the

Emotion Series line are planned for next year. AKG has developed the new "Doubleflex" technology, which is a two-way elastic suspension system that mechanically isolates the microphone capsule and reduces handling noise. The Emotion Series also uses neodymium magnet assemblies. For more details, contact AKG

THREE-PEAT

The Miles Technology MTI-3 incorporates a patent-pending electroacoustic imaging process called TriSonic Imaging, which takes the center-panned sound sources in the mix and reproduces them in the center channel. Side-panned sounds radiate unmasked from the side loudspeakers. This process results in

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ALLEN & HEATH GL3000 MIXING CONSOLE



THE ALLEN & HEATH GL series of consoles has provided many live-sound companies with consoles that are as flexible as they are portable and are specifically designed for live-sound applications. The GL3000 reviewed here offers a sensible combination of features based on the GL3 console with a few items (such as eight sub-groups) borrowed from the top of the range GL4 mixer. The result is an easy-to-use mixer suited to mixing the FOH sound at an afternoon concert in the park and then throw on top of some road cases at the side of the stage to mix monitors for an evening club gig. The switch-over between tasks is accomplished by recessed pushbuttons on the face of the mixer. The result is a mixer that has all of the most important practical requirements for each task, available whenever the need arises.

The GL3000 is based on a steel chassis that contains modules of eight mono inputs; four stereo and four mono inputs; and a master module with eight groups, left/right master, two stereo returns, two matrix outputs, and the masters for the eight auxiliary sends. The review unit also included the optional M24 meter bridge with medium-sized VU meters for the groups, L/R masters, and PFL/AFL level. The mechanical VU meters are especially appreciated by anyone who must work in direct sunlight, known to make LED meter indications virtually invisible. For those who work in less intense lighting, the basic console includes LED ladders for the L/R masters that switch to PFL/AFL. There are also four-stage LED indicators above each group fader and three-stage LED indicators above each input fader. All the frame

sizes have the master section located centrally within the chassis so that the

operator can easily see and reach any control on the console.

ROAD TEST

MANUFACTURER: Allen & Heath, 8760 S. Sandy Parkway, Sandy, UT 84070. Tel: 801 566-8800.

APPLICATIONS: Mixing live sound FOH or onstage monitors and some recording uses.

SUMMARY: A flexible eight bus console that quickly reconfigures to suit the FOH or monitor engineer and expands on features of the GL3 console that preceded it.

STRENGTHS: Consistent coloring of controls simplifies operation, controls swap to suit FOH or monitor use, dedicated full-function stereo inputs, meter bridge option, expandable frame.

WEAKNESSES: Users must check status of configuration buttons carefully; no output connectors for four of eight group outputs.

PRICE: \$6444, 20 mono and four stereo inputs, eight groups, stereo master and two output matrix with optional meter bridge (as reviewed); \$5595, GL3000-824 20 mono and 4 stereo input version (without meter bridge); \$849, optional meter bridge for 24-channel chassis.

EQ FREE LIT. #: 126

BY WADE MCGREGOR

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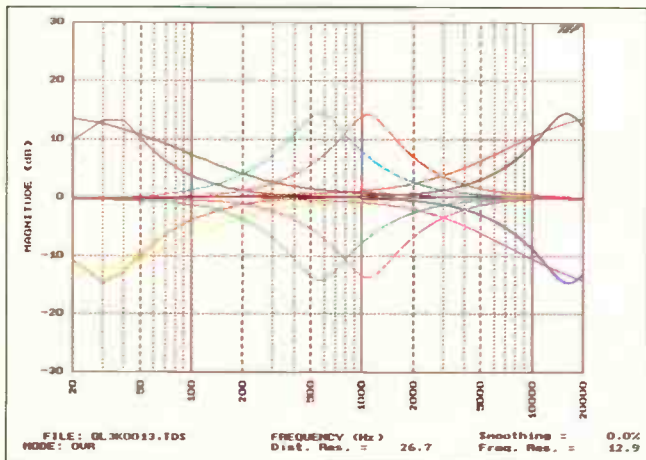


FIGURE 1: The 4-band equalization of the GL3000 mono inputs covers the audio range with significant overlap between bands. The two midrange bands sweep peaks or dips from 35 Hz to 1000 Hz (low-mid) and 500 Hz to 15 kHz (high-mid), while the shelving filters are shown as gentle slopes at each end of the spectrum. The slightly flattened appearance of the low-frequency peak/dip is an artifact of the measurement.

The outputs from the console are an interesting variety of formats and compromises. The primary outputs (master L/R, mono, aux 1 to 4, and groups 5 to 8) are fully balanced; the secondary outputs (aux 5 to 8, matrix output and 2-track send) are quasi-balanced (a resistor between the "cold" connection and ground); while the inserts on the inputs and balanced outputs are all unbalanced send and return on a single 1/4-inch phone jack.

Although anyone expecting to use the console for recording to an 8-track may find the lack of group outputs 1 to 4 to be a limitation, in many live-sound applications this compromise makes sense. Aux 1 to 4 often drive the line back to the stage monitor amp rack and must be fully balanced, whereas the last four auxiliary outputs (5 to 8) are usually only going to a nearby effects rack and will usually be OK if unbalanced.

This said, balanced connections offer a greater level of confidence when everything around you can change from venue to venue. There is an option to balance the matrix output, but clearly the cost of balancing all connections on the console would place the unit out of reach for many prospective buyers. We now live in an age where the quasi-balanced connection is becoming the norm for low-cost consoles — however compromised this connection may be in less-than-ideal situations.

Allen & Heath deliver their usual good signal-to-noise ratio (90 dB with 16 ch. routed to master output) and provide the kind of gain structure and headroom that is so necessary to coping with *live* sound. The GL3000 is specified to be able to drive the balanced outputs up to +27 dBu before clipping; unbalanced outputs max out at +21 dBu. The balanced outputs are all

XLR connectors. Sys-Link (an A&H standard) provides the optional capability to connect all the busses, aux; group; L/R; PFL/AFL; and DC control, between two consoles.

The auxiliary sends can be switched on each input from pre-fader to post-fader in groups (aux 1–4 and aux 5–8), but can be permanently assigned individually by resoldering jumpers on each input circuit board. There are also jumpers to change the sends from pre-EQ to post-EQ and pre-mute to post-mute. These features combined with other jumpers for meter source and the switching assignment of group/aux masters and the Mono Master function create a very flexible design that can be adapted to suit very individual working styles.

The switches convert the console to an on-stage monitor mix console with little compromise. The auxiliary masters switch from knobs to full-size (100-mm throw) faders. The Mono output switches from a sum of the L/R masters to being fed by the PFL/AFL bus for driving a listen wedge. All the main outputs (aux 1–8, group 5–8, Master Left and Right) include inserts to allow patching in comp/limiters or EQ.

The mono and stereo inputs also include inserts. These are of the tip-send, ring-return single-phone jack variety. The output matrix includes input levels from each of the eight groups and the left/right masters. This allows two (A and B) independent mixes to be compiled from these sources for productions where a simple Left and Right is not sufficient. Unfortunately, the console stops short of individual

group and master assignment or a full complement of group outputs required for many live theater applications.

The inputs feature phantom power, 20 dB (or line I/P), and high-pass filter switches at the top of the strip along with the 50 dB range input gain control. The mic preamp is clean and well behaved with an active front end that suits most situations. You will have to pay a lot more to get the truly bulletproof input transformer that sounds as good. The 4-band EQ covers the spectrum nicely (see fig. 1), with two variable-frequency midband sections (mono I/Ps only) and includes a bypass switch. The bandwidth of the mid filters are sufficient to hone in on problems and smoothly shape the tone of an instrument. Just don't expect to punch in a 40 dB notch.

After the eight auxiliary sends is a pan pot (balance on stereo I/Ps) and the bright red Mute switch with an even brighter red LED indicator. Beside the 100 mm channel fader are an input-level meter, PFL switch, and the five stereo pairs of group and master bus assignment switches.

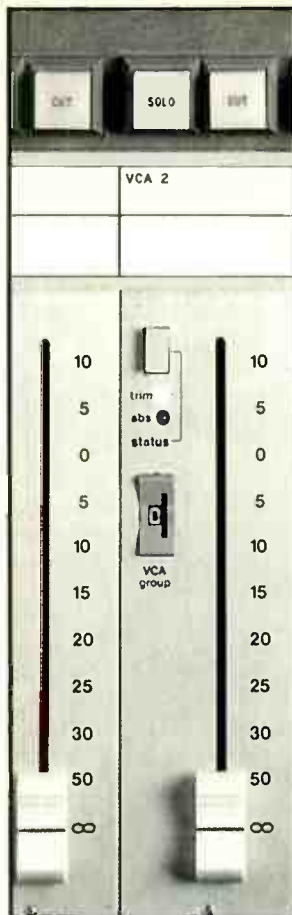
In addition to the mono and stereo input sections, there are two stereo effects returns assignable to the L/R master, one pair of groups, and the Matrix masters. There is a dedicated interface for connecting a DAT or cassette deck to play walk-in music and record the show. Dedicated send and return levels mean no inputs are wasted for this use, and switching allows the tape to be cued in the headphones or directly routed to house through the L/R masters. There are indi-

vidual talkback buttons for each aux send and an XLR so you can plug in a real microphone instead of using a \$3 thing buried in the metal work.

The knobs and faders are clearly colored to make it easy to identify functions, and the optional meter bridge includes the group or master reference in the lighted portion to maintain visibility even in darkened venues. The rack-mount power supply includes an LED to indicate power on and is convection cooled to limit the noise to just the buzz of the transformer. External supplies, such as this one, are essential to minimize the electronic noise floor within the console. The console's solid construction offers confidence that the show will go on regardless of road or roadies between venues.

The GL series of consoles has offered a clear focus on live-sound reinforcement by a manufacturer that continues to listen to the users on tour, in rental companies, and at small venues. Everything from the contrasting colors on the controls to the very specific signal routing capabilities show that this console is built for small-to-medium-sized gigs. If double-duty is a regular job for your console, then consider trading it in for one that was built for it.

Wade McGregor is a senior consultant for Barron Kennedy Lyzun & Associates, an acoustical consulting firm based in Vancouver, BC. For more info, visit their home page at www.bkla.com.



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E-mu's Darwin Evolves: The ADAT Connection



MANUFACTURER: E-mu Systems, Box 660015, Scotts Valley, CA 95067-0015. Tel. 408-438-1921.

APPLICATION: Eight-track hard-disk recorder designed for stand-alone use or with ADAT systems.

SUMMARY: It's not as sophisticated as computer-based hard-disk recorders, but Darwin enhances ADAT with editing capabilities, while ADAT provides cheap backup for Darwin.

STRENGTHS: Easy-to-use, non-intimidating interface; excellent sound quality; digital routing is well-implemented and all bouncing occurs digitally; complements ADAT well; multiple levels of undo; "virtual slave reels" make 8-tracks seem like much more.

WEAKNESSES: No DSP; display doesn't show waveforms; cannot slave to MIDI systems; no automated mixing or punching; can't reference times to bar/beats/measures.

PRICE: Model 4000 (no hard drive), \$3195; model 4001 (internal 1 GB drive), \$3795; model 4002 (internal Jaz), \$3995; model 4003 (reviewed; with Jaz, ADAT sync and digital I/O), \$4374. Accessory boards: ADAT optical I/O, \$149; ADAT 9-pin sync, \$379; 4-input analog expander, \$249.

EQ FREE LIT. #: 127

BY CRAIG ANDERTON

ADAT's "light pipe," and ADAT 9-pin sync card), Darwin is now being positioned as an adjunct to ADAT-based studios. So rather than reviewing Darwin on its own, we thought it would be best to look at E-mu's new little beast in a system context, and see if it really does improve life in the project studio when mated to ADAT. —HGL

Question du jour: Tape or hard-disk recording? If your budget allows, I've always recommended having both — tape excels at capturing and storing signals, while hard disk is great for editing. Apparently E-mu feels similarly, because they're making a case for not buying that second or third ADAT, but buying a Darwin instead. Like ADAT, Darwin provides eight tracks of digital audio, responds to the BRC and other ADATs, and is even about the same size. But it also has several tricks up its sleeve that ADAT doesn't. Have we arrived at a "best of both worlds" situation? Let's investigate.

BASIC DARWIN

For those unfamiliar with Darwin, here's an overview. This 3-rack space, self-contained 8-track hard disk recorder offers

BY NOW YOU may have read reviews of E-mu's Darwin hard-disk recorder in other publications (that's okay, we're not the jealous types). EQ didn't mind waiting on this one because we knew this

product would go through changes. And Darwin has indeed evolved into a different type of product; thanks to the latest software/hardware options (optical I/O board for communicating with



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several storage options: internal hard drive, no internal hard drive (use the SCSI port), and internal Jaz. I/O includes 8 analog outs, 4 analog ins (optionally expandable to 8), S/PDIF, headphones, punch/record footswitch, and MIDI in/out/thru. There's a SCSI port for additional hard drives and a computer port for future expansion (this is currently unimplemented). The display is a backlit 5- x 1.5-inch LCD; it's better than tape, but spartan compared to computer-based hard-disk recording programs.

Darwin has some fun tricks; my favorite is "virtual slave reels." You can copy a song to create different, memory-efficient "versions," which opens up many editing options. As just one example, copy a tune with stereo drums, vocals, piano, bass, and rhythm guitar (each part on its own track) to create a new version. Premix everything in the new version to 1 track as a reference. Next, record several lead guitar parts, then create a fabulous composite solo by keeping the best bits (and erasing the rest) from each guitar solo prior to bouncing them to a "composite" track. At this point you're still working with the copied version. Finally, cut (or copy) the composite track, and paste it back into the original song. This isn't quite the same as having unlimited tracks, but it sure makes eight tracks feel like a whole lot more.

Also handy: 40 autolocate points, multiple levels of undo, and a shuttle/jog wheel for scrubbing (however, it's choppier and less precise than rocking the reels on analog tape). Editing is basic — cut, copy, insert, replace, erase, insert silence, and move — but definitely functional. Darwin can output MTC, but cannot slave to MIDI (although it responds to MMC controls for start, stop, etc.). It syncs up easily with ADAT via the 9-pin card as master or

slave.

Signal routing is all-digital; there are five presets and one user preset (although its settings aren't memorized when you power down). The internal digital mixer is great for bouncing, but there's no automation. Nor is there any DSP, other than the adjustable crossfade time that comes into play when doing edits. (E-mu has already anticipated many of these critiques; see the "Preview" sidebar.)

Recording is straightforward, however, you can't drop in autolocation points "on the fly," nor is there autopunch (use the front-panel controls, a footswitch, or MMC commands). I found it simplest to record the part to be punched on a separate track, copy it, and paste it over the punch zone on the track to be fixed.

What Darwin may lack in sophistication, it makes up for in ease of use. When someone buys a computer-based hard-disk system, my advice is not to use it on a session for at least a week while you learn your way around. Darwin is the opposite — I had it figured out in a couple hours, which included unpacking, installing three option boards, and reading the entire manual (which is clear and easy to follow).

DARWIN MEETS ADAT

Using the two as a team is a snap once you get used to some new concepts. For example, the two systems' rewind/fast-forward times differ, so if you tell the master to rewind, the slave may rewind at a slower or faster rate, depending on whether you've selected fast or slow wind modes on the ADAT and Darwin (these are not identical and do not track each other). As a result, with ADAT slaved to Darwin, Darwin starts playing before the ADAT locks up, which can take several seconds if the two are at very different times. If Darwin is the slave, it plays back shortly after the ADAT starts, which is more predictable.

Frankly, though, this is all pretty moot because you'll end up doing most of your locating with the autolocation buttons. Autolocation is fast, simple, convenient, and works equally well whether Darwin is the master or slave. As a master, Darwin's transport Stop button can also thread/unthread the ADAT tape.

Darwin allows 44.1 or 48 kHz sampling, although ADAT was never really intended to be a 44.1 kHz system, and it's less confusing to keep everything at 48 kHz (if you run at 44.1 kHz with a BRC, MIDI sequencers fed from the BRC will play back slower compared to using the sequencer's internal clock, and the ADAT time display will read slow compared to Darwin).

Transferring parts between the two devices is simple. Although Darwin can save to an external DAT drive, it's a lot easier to just blast the eight tracks over
continued on page 140

PREVIEW: VERSION 2.0 IS COMING

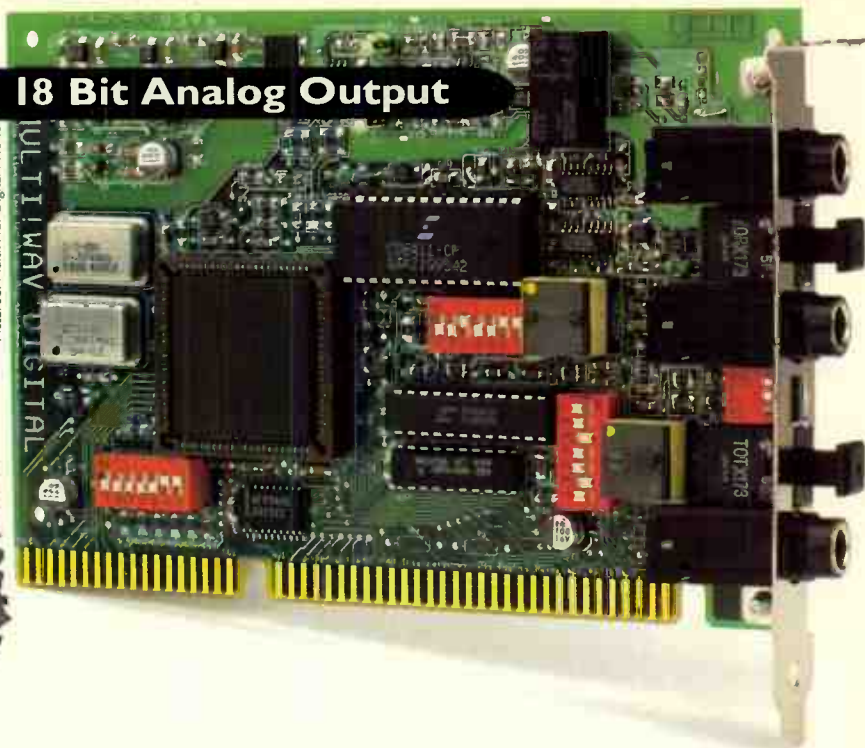
According to E-mu, Version 2.0 software (slated for release at the Los Angeles AES convention) will offer:

- Support for a SMPTE card, which handles all timecode formats. It features timecode in/out on balanced 1/4-inch jacks and BNC word clock in/out.
- Support for a floating point, 32-bit processor-based DSP card. Initial functions include gain and fade control, time compression/expansion, and high-quality polyphonic pitch shifting.
- Mixer levels can be controlled via MIDI
- Front-panel and ADAT 9-pin autopunch
- On-the-fly storage of locate points
- QIC tape drive support for low-cost SCSI backup

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Pictured: Multi!Wav Digital PRO/PRO 18



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Yamaha MD4 MD Recorder/Mixer



MANUFACTURER: Yamaha, 6600 Orangethorpe Ave., Buena Park, CA 90620. Tel. 714-522-9011.

APPLICATION: "Ministudio" sketchpad for songwriting, arranging, demos, live recording, etc.

SUMMARY: The cassette multitrack recorder has finally met its digital match in this MiniDisc-based 4-track recorder/mixer.

STRENGTHS: Sound quality vastly superior to cassettes; MIDI sync doesn't require giving up a track; can bounce into already-recorded tracks; quiet operation; "Undo" function by saving copies; fast locating; variable speed option; easy to use.

WEAKNESSES: Tempo map not saved with song; mixer knobs don't feel particularly solid; no digital I/O; data compression inherent in system; limited compatibility with standard audio MDs.

PRICE: \$1199

EQ FREE LIT. #: 128

BY CRAIG ANDERTON

WHEN I FIRST heard about multitracks based on the MiniDisc (a format touted by Sony as a replacement for the analog cassette), the concept seemed like a strange match. But now that I've lived

with one for a bit and had the time to put any prejudices aside, I'm quite impressed. Twenty years ago, when the dollar was worth a lot more, it cost almost \$1000 for an analog 4-track recorder. To-

day, a little over a grand buys a 4-track digital ministudio that runs circles around cassette ministudios, and even incorporates some hard-disk and digital-tape recording features. Yup, there's a new toy in town — and it's much more than I had expected.

BRAVE NEW WORLD

The MD4 resembles a tape-based ministudio. However, while the mixer is a traditional analog type (see sidebar), optical-based recording offers several advantages. The first time you bounce four tracks into one without needing a spare track to bounce into, or sync up a MIDI sequencer without having to stripe a track first, you'll know you're not in Kansas anymore.

The MD4 uses MD data storage discs (not MD discs intended for recording audio, although standard audio discs will play back on the MD4; see sidebar). These provide about 37 minutes in 4-track mode, 74 minutes in stereo mode (which is not compatible with standard audio MD playback), or 148 minutes in mono. You can mix and match the various modes within a given disc, but not within a given song. A total of 254 songs can be recorded and titled, but you'll hit that limit only if you record a ton of short cues or samples.

MiniDiscs have a TOC (Table Of Contents) area that tells the machine where to find particular pieces of data or edits, and must be updated periodically. If the power goes away before updating the TOC, you could lose data. For-



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fortunately, an indicator lets you know when the TOC needs updating, and it's impossible to eject the disc without finalizing the TOC.

At present, finding MD data discs from a source other than Yamaha is difficult. No one even knew what I was talking about when I called large computer stores, such as Fry's. Fortunately, with TASCAM and Sony also having MD-based multitracks out in stores, the market should heat up a little bit and make discs more widely available in this

country (they are readily available in Japan, where MD has been quite successful). Hopefully the price will also come down a bit from the current U.S. cost of \$29.95 per disc.

PONG & PUNCH

The MD4 can record on all four tracks simultaneously, but you can build up more tracks through clever ping-ponging (bouncing) options. Bouncing occurs through the analog mixer, not digitally. However, the quality remains

high through multiple bounces; certainly there's no comparison to the humiliation that bounced signals endure with analog cassettes. The "feel" is just like piloting a cassette-based device, since you spend most of your time working with the mixer; when you do think about the transport, it's mostly to realize you're not waiting for rewinds or fast forwards any more.

The MD reads data from the disc before writing, so you can play back all four tracks while bouncing down to the destination track or tracks (yes, you can mix down your song within the MD4 itself by bouncing to two tracks!). Although this overwrites existing track data, a rehearsal mode lets you practice the pre-mix. Better yet, you can copy the song you're working on elsewhere in the MD as a "safety." This lets

you record with a much more secure feeling.

The concept of bouncing to a different part of the MD is a radical, and way cool, departure from tape. For example, suppose you want to pre-mix a song with guitar, bass, drums, and piano before adding vocals. Copy the song, pre-mix the copy, then add vocals. If while adding the vocals the guitar seems too loud, no problem: nuke the copy, re-copy the original, do another pre-mix, and try again. You can "archive" a song in various stages of completion so that if you need to "undo," you can at least go back to an earlier version and try again. Incidentally, copying a song also copies the title, location markers, and tempo map (described later), in addition to the audio.

But wait...there's more. A divide function can cut a song at any point, converting it into two new songs (songs are renumbered if needed). Songs that were divided can be recombined later on (another "undo"-like function, but you cannot combine unrelated songs; they must have been joined previously).

You can also copy tracks, or parts of tracks, to other tracks. One scenario would be to record four vocals over a sequenced MIDI background, then copy the best parts of each to the fourth track to create a composite vocal. Individual tracks can also be erased. All this is done similarly to working with cassette multitrack recorders.

Punching is well-implemented. You can punch manually, with a footswitch, set up autopunch points on the fly, or set points manually while the unit is stopped. Pre- and post-roll times (times before and after punch-out, respectively) are independently adjustable from 0 to 9 seconds, and a rehearsal mode lets you audition the punch before committing to it. In this mode, the machine simulates the punch, proceeds to the post-roll point, then returns to the pre-roll point so you can do another rehearsal or punch "for real." This sequence of events can also be initiated via footswitch. Punches are accurate to within ± 5.8 ms, since the MD4 stores data in "frames" that are 11.6 ms long.

YAMAHA MD4 MIXER FACTS

Connections

- 1/4-inch phone: 4 mic/line ins, L/R aux return, mono aux send.
- RCA phono: Stereo submix in, stereo out, stereo monitor out, 4 track direct outs
- MIDI out
- Headphone out

Input Strips (4 total)

- Gain (accommodates mic and line signals)
- EQ (3 controls: ± 12 dB shelving @ 12 kHz and 80 Hz, ± 12 dB peaking @ 1 kHz)
- Mono aux send (stereo returns)
- Group assign (1/2 or 3/4). Assigns input signal to the desired track. It works in conjunction with the panpot (e.g., if 1/2 is selected, the panpot sends the signal to group 1 or 2 at the extremes of rotation, or anywhere in between).
- Pan control
- Input select (mic/line or playback from disc)
- Fader

Master Section

- Aux return group assign. Works similarly to the input strip group assign; the return is also permanently assigned to the stereo bus for mixing.
- Aux return level. Adjusts the stereo returns level.
- Stereo submix group assign. This works like the aux return group assign, but with the signal connected to the stereo submix in (e.g., from another mixer, tape, or CD, etc.).
- Stereo submix input level. Adjusts the stereo submix in levels.
- Monitor select switches. Choose from groups 1/3, 2/4, master stereo bus, or cue bus.
- Cue level (four separate controls for each track)
- Monitor level (sets monitor out and headphone volume)
- Stereo master fader

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TRANSPORT GOODIES

There are no standard rewind and fast forward functions, but rather 2X and 4X cue and review modes. Little fragments of the signal play back as you shuttle across the disc, so you know where you are; even when reviewing, the signal never plays "backwards."

To locate to points in a song, it's faster and easier to use search functions. These include:

- Search for song. This works like the buttons on CD players that take you to the next or previous song.

- Search by time. Lets you specify and go to a specific time within a song, or anywhere in the disc.

- Find most recently set record in and out points. This is also handy for checking punch points.

- Search for markers. There are ten markers: Start and End, (which cannot be edited) and eight user markers you can insert during playback and/or record. These can be edited or erased; existing markers are renumbered when you insert a new marker between existing markers. One very cute feature: when editing marker locations, the MD4 performs a temporary volume change at the marker so it's easy to hear precisely where the marker occurs. I wish all programs had this feature, it's an obvious and effective aural cue.

You can create a playlist of songs recorded on the MD, but there are also repeat (loop) and cue list (playlist) options — loop one specific song, all songs, or a user-definable portion of a song. Playlists are assembled by using marker locations and specifying the order in which cues should be played. Up to nine steps are available; each step specifies the start marker, end marker, and number of

MINIDISC BASICS

The MiniDisc (MD) is essentially a miniature, recordable magneto-optical disc that comes in two formats: Audio (designed for the MiniDisc record/playback audio devices targeted to consumers) and Data (used for computer storage and, now, multitrack recording).

To get the most out of its 140 MB storage capacity, the MD uses data compression (or more correctly, data omission), which discards portions of audio deemed unnecessary, such as silence. Although the coloration is subtle, compared to DAT, the sound seems a bit more compressed (which affects the stereo imaging somewhat) and has a more "hyped" high end. Then again, that seems to be an effect lots of people are looking for these days. However, let's put things in perspective: the coloration isn't even remotely close to what a cassette does to your sound under the best of circumstances, and the effect is subtle enough that many people don't even notice it. Given the advantages of optical over analog tape-based systems, compression is a tradeoff that's easy to accept.

repeats (1 to 9). For example, the MD4 could play from marker 1 to marker 5 three times in a row, then marker 2 to marker 3 twice, and so on.

One caution: If you remove a marker, even if it's not used in the cue list, you'll get an error message when you try to play the cue list. This problem does not occur if you simply edit the marker positions.

Does this sound like the ultimate sketchpad remix machine? Close, but there's no way to crossfade between sections, and you may not be able to place a marker exactly where you want due to the 11.6 ms frame size. Still, despite a warning in the manual that there can be discontinuities during transitions, the cue list feature worked extremely well when testing out remix options on a song I'd transferred over to the MD4. After the playlist is set, you can even create a new song that glues all the pieces together in the order you specified.

A pitch control provides a range of about ± 6 percent, and the sound quality remains excellent while pitch changing. One tip: If you slow down the full amount, it's easier to find precise points when editing marker locations.

continued on page 140

GET CONTROL OF YOUR

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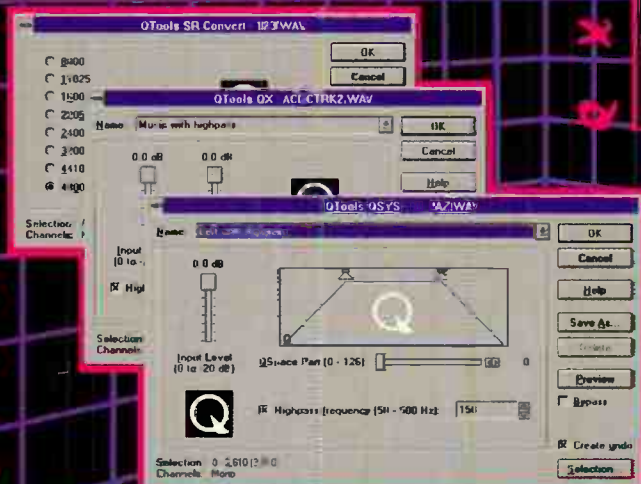
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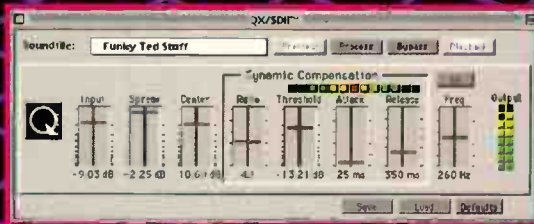
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DSP•FX Digital Effects Processor



MANUFACTURER: Power Technology, 100 Northhill Drive, Building 24, Brisbane, CA 94005. Tel: 415-467-7886. Web: <http://www.dspx.com>

APPLICATIONS: Very high-quality reverberation, echo, flanging chorus-ing, and pitch-shifting effects for studio applications.

SUMMARY: An effects device capable of clean and dense reverb and time- and pitch-shifting effects with a unique interface that brings all parameters into view at a glance.

STRENGTHS: Excellent true stereo effects; very low noise floor; hugely expandable while still very easy to use; software support for multiple DSP-cards.

WEAKNESSES: Requires a PC host that will typically have a noisy fan; currently limited to one effect per DSP-card; may require careful PC slot selection to avoid internal PC noise when using on-board analog I/O.

PRICE: \$1299, Studio System with hardware and five software modules (as reviewed); \$799, basic unit with hardware and one software module of your choice

EQ FREE LIT. #: 129

BY WADE MCGREGOR

WE HAVE SPENT so many years staring at the tiny displays of the typical effects unit that we can be forgiven in assuming that it is the only way to control our effects. Although there were a few MIDI-tots that used a computer and MIDI interface to enlarge their window into the world of algorithms, the rest of us developed a knack for using nudge buttons and parameter knobs. We also resigned ourselves to either spending serious money for a high-end unit or using phone jacks and 16-bit conversion as the normal connection to our mixers.

Power Technology has developed an effects system that sidesteps not only the limitations of the typical rackmount processor, but also the limitations of the DSP architecture that powers most of the current units on the market. Unlike the other effects processors, the DSP•FX is a card that is inserted into the ISA-bus of a PC. Thankfully, it doesn't suffer from the limitations commonly associated with internal cards in computers because all of the audio functions remain on the card. The connection to the computer is simply there to provide the virtual front-panel interface for the unit. This allows the DSP•FX to maintain

high-quality audio in spite of the noisy and clumsy (for audio) internal workings of the IBM-compatible computer. The result is a device producing effects that

are excellent in both sound quality and user interface.

The DSP•FX provides a visual interface that is extremely easy to use and shows everything you need to know about the parameters in a single glance. The ability to bring a software-based user interface onto the computer screen allows the designers at Power Technology to focus on visualizing (see fig. 1) the parameters with the full power of a VGA display instead of simple text and graphs on an LCD in the front panel of a device. By using the mouse and keyboard, it is easy to adjust the parameters, and the graphics display the results as the changes happen. The computer also simplifies the storage and recall of presets. Users will be able to add new effects algorithms or download other users presets from the Internet and immediately try them out on their processor. Power Technology has developed a scheme for upgrading that will allow users to receive the new plug-ins (\$199 each) via the Internet or on disk.

The Studio System version (as re-

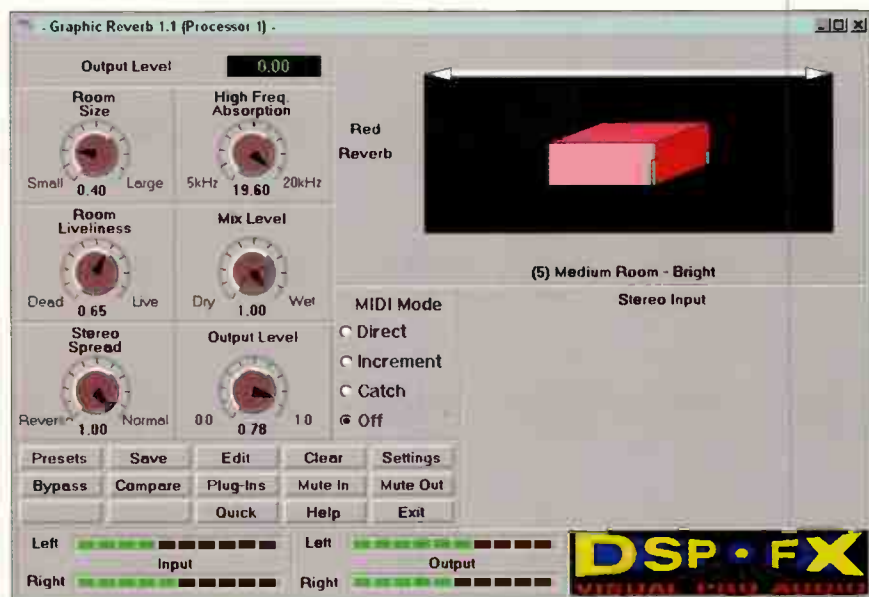


FIGURE 1: The reverberation control screen for the DSP•FX. Parameters are controlled using the mouse to adjust (surprisingly easily) the knobs. The image on the left shows the current settings of the controls through visual metaphor.

FOLIO



SPIRIT



THE FACTS (& no Bull)

At Soundcraft, designing the mixing consoles people actually want has been a serious business for over 22 years. We've listened to our customers - from budding musicians to world-renowned artists and sound companies - and we've built their wish-lists into our mixers. We don't hype our new features and we don't go in for gimmicks. When you listen to SX you'll realize we listened to you.

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FOLIO SX is a powerful, multipurpose mixer with DAT quality sound, housed in a freestanding frame with carry handle.



\$769⁹⁵

Suggested Retail in USA

- 20 inputs (including 4 stereo channels) as standard, enough for most live and recording situations
- 12 mono inputs with UltraMic™ preamps giving 60dB of gain range and +22dBu of headroom, allowing any mic or line device to be plugged in.
- Two sub-buses allow you to record groups of instruments to multitrack, send them to additional speakers, or sub-group to mix. SX also has a dedicated Mono Out.
- 8 Direct Outs switchable pre/post fader, equally useful when recording in the studio or at a gig.
- 100mm faders throughout
- Real British 3-band EQ with swept mid
- 18dB/Octave High Pass Filter effectively reduces low end muddiness.
- 3 Auxiliary Sends: 2 can be pre- or post-fader.
- Custom-designed consistent controls give an even spread of control around their sweeps.
- Surface-mount technology
- Rack mount option

SX's Direct Outs on the first 8 inputs are front panel switchable pre-fader for live track laying or post-fader so you can "massage" recording levels in the studio.

MONO INPUTS

- UltraMic™ padless preamp gives 60dB of gain range with 22dBu of headroom
- Insert point for effects
- Direct Out on channels 1 - 8
- 100Hz steep slope High Pass Filter
- 3-Band "British" EQ with swept mid
- 3 Auxillaries configurable 2 x Pre/1 x Post or 1 x Pre 2 x Post
- Channel "ON" switch
- MIX/SUB routing switch
- Full 100mm fader
- PFL

STEREO INPUTS

- 13, 14, 17 & 18: simple phono inputs with Level and MIX/SUB routing
- 15, 16, 19 & 20: Balanced jack inputs with Gain, 2 band EQ, Aux levels, Channel "ON", MIX/SUB routing, 100mm fader and PFL

- ### APPLICATIONS
- LIVE SOUND**
Bands, small venues, conferences, schools, places of worship
 - STUDIO RECORDING**
Digital and analogue multitrack (4 & 8 track), small or home studios, pre-production, video post production
 - SUBMIXING**
 - LOCATION SOUND**

TYPICAL SPECIFICATIONS

Mic EIN	-129dBu
Crosstalk (1kHz):	
Channel Mute	<95dB
Fader Cutoff	<90dB
Frequency Response (20Hz to 30kHz)	<1dB
THD	<0.006%

SURFACE MOUNT TECHNOLOGY BREAKS THE FEATURES/PRICE BARRIER

As one of the world's largest mixing console manufacturers, Soundcraft has invested in the most advanced production systems available. Leading edge circuit construction using

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CIRCLE 145 ON FREE INFO CARD



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World Radio History

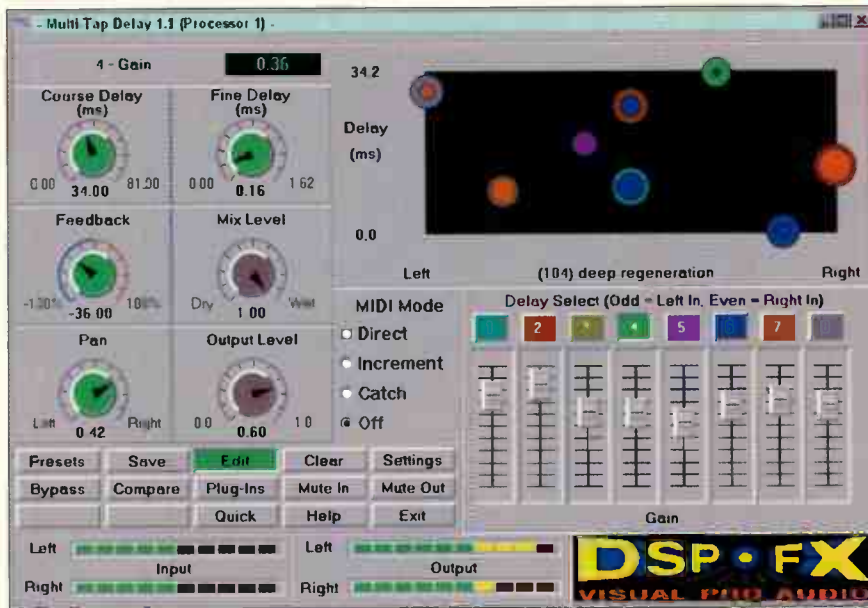


FIGURE 2: The Multi-Tap Delay control screen displaying the individual (Edit) parameters for channel 4 (green). The image at the upper right shows the settings for all eight delays including: panning (location left to right); relative level (size of outer circle); feedback (size of inner circle); and delay (relative vertical position). A single glance provides confirmation of all settings.

viewed) includes the full set of effects, reverberation, echo/delay, flanging, chorusing, and pitch shifting. All these effects were supplied with a wide range of useful factory presets and, of course, the number of user presets are unlimited. Parameters are well chosen and provide a useful range of control that is deeply enhanced by the visual feedback of the graphic display. This graphic display incorporates sensible metaphors for each parameter that allow you to see, in a single glance (see fig. 2), all of the settings of even the most complex presets.

Note that most current effects processors use a 24-bit fixed-point DSP to manipulate the audio. This seems sufficient considering we can be quite happy with the quality of 20-bit audio. However, as signal levels decrease, such as with a reverb tail, a fixed-point DSP begins using less and less of its 24-bit path word to represent the signal. This results in a signal path that can often be far less than 24-bits — a detail that is most noticeable in the tail-out of the effects as the processing approaches the noise floor. The audible result is a grungy distorted sound to the very low-level audio signal.

The DSP•FX employs a new Texas Instruments TMS320C32 32-bit floating-point DSP to increase the dynamic range of the audio (the floating-point format always uses all 32 bits to represent the signal value) in order to eliminate the low-level distortion common in effects that depend on considerable re-

generation, such as reverb and echo. The result is especially noticeable in longer reverb settings, where the sound decays smoothly and cleanly. There is also a notable lack of stuttering or pitch to the reverb. I found that it was easy to create a recital hall for piano tracks or a cathedral for a choir. The small room settings were able to create a convincing ambience for a jazz trio that gave the impression of small, smoky room without any of the hollow tube quality common to small room settings in lesser reverberation units. The DSP•FX is also capable of true stereo reverberation (input panning affects the early and late reflection localization) available in only a couple of other reverb units on the market.

The brightness of the reverb can easily be adjusted with the high-frequency decay control. (I would also like to have control over the relative decay rates of the mid and, especially, the low frequencies.) I found the density (diffusion) control to be far too subtle and would prefer far more diffuse reverberation for some applications. I also experienced some noise from the on-board I/O when the DSP•FX card was too near the video card in the computer, and some of the longer reverberation (Room Liveliness) settings had a tendency to cause low-level oscillation when left without an input signal.

The DSP•FX's echoes remain clear and even intelligible after seconds of regeneration. They are so good that you can use them with a little regeneration

to create small rooms for background vocal tracks or blending horn sections. The chorusing and flanging are excellent and hearken back to the days of a finger on the reel of an Ampex AG-440. The visual interface provides not only a reference during adjustment, but allows you to remember (visually) which range of settings were suitable to a particular guitar style or drum track. The quality of the chorusing and flanging allows even excessive settings to work without obscuring the original instrument. The pitch-change algorithm sounds very clean, however, I had difficulty losing the slight vibrato quality.

The unit offers MIDI control over all parameters for each module. This allows control over the unit even when it is buried behind other Windows applications. By assigning a MIDI switch, access is even gained to the parameters in the Edit page, such as the reverberation; early and late decay; or density (diffusion). With sufficient MIDI controllers, you can remotely access all of the on-screen parameters. Power Technology offers a gold-colored version of the JL-Cooper CS-10 MIDI controller (\$999) that features dedicated knobs, switches, and faders for all the MIDI-addressable controls of the DSP•FX. The DSP•FX is compatible with any CS-10. It only took a few minutes to set up my Lexicon MRC (MIDI remote control) to achieve hardware fader/pushbutton control over the most important parameters. MIDI control requires a MIDI interface (not included) for your PC or Windows application that can produce controllers (such as Cakewalk or SoftMC) and offers potential for automation control of the effects. The clearly written and well-organized manual includes a complete listing of the MIDI control values.

The DSP•FX is part of an open-ended DSP platform. For those who do not own a Windows-based PC or don't want to open up their computer, a complete package (DSP•FX Power Pack, \$3995) is available, including a rack-mount PC with room for up to six DSP cards connected on a high-speed proprietary bus. An optional rackmount 2-channel interface with 20-bit A/D and

continued on page 142

Ridge Farm Gas Cooker Tube DI



MANUFACTURER: The Home Service, 178 High Street, Teddington, Middlesex TW11 8HU, United Kingdom. Tel: 44-181-943-4949.

APPLICATION: Project and commercial studios; guitar rigs; live sound.

SUMMARY: Two-channel, all-tube DI.

STRENGTHS: Stonking sound [US translation: *real good sound*]; superbly variable; very versatile; perfect tube DI.

WEAKNESSES: Not a rackmount.

PRICE: \$649

EQ FREE LIT. #: 136

BY ZENON SCHOEPE

DESIGNED BY THE boffins [US translation not available] at Ridge Farm residential studios in Surrey, England, the Gas Cooker is based on a unit originally built in response to client requests for tube gear and which sat on the studio floor for years in a wooden box. It was tested along with two other DIs by Geoff Emerick, Alan Parsons, and John Hudson in the August '96 issue, but we felt it also deserved our typical EQ "In Review" treatment.

The Gas Cooker is now commercially available and it's an all-tube (three ECC83s) twin-channel DI box

with a switchable 20-dB input pad, a buffered unbalanced output (which is pre gain-control pot), and unbalanced and balanced post gain-pot outputs (the last sporting transformer isolation with a switchable ground lift). All connections except the unbalanced output are on the front panel.

Gain is controlled on two, large, old-fashioned, gas-cooker-style knobs that are calibrated and marked for unity gain at around the number 3 on the scale and offer a maximum of X30 on the unbalanced output and a maximum of X3 on the balanced connector.

The Cooker's fairly meager controls and facilities are extremely adaptable. Aside for the usual DI'ing of guitars and basses, it can be integrated into a guitar rig as a very capable front end. Keyboards get in on the act by virtue of the variable gain and you can color the sound up to taste. Plus, you can process console outputs. If you track with it, you'll end up with something that sounds distinctly different from what you would have got otherwise.

This DI sounds absolutely stupendous. It probably is the best DI I have ever used because it's so variable and because it stamps TUBE on everything it goes near — immediate resonance and thickness without any loss of quality.

This box provides the best clean DI guitar sound I have ever achieved. The sensitivity is marvelous. Driving the gain harder doesn't give you a mini-Marshall stack sound, but it does dish out a meaty chordal sound with hotter humbuckers.

Bass guitar sounds smooth and goes on forever through the Cooker, and yet it still holds everything together even if you tune the bottom E down a couple of tones.

Quite honestly, if you had one, I can't think of any good reason why you would not want to use the Cooker all the time. **EQ**



Organic Digital Solutions

Time to clean up the mess
from this past summer

BY EDDIE CILETTI



All summer long I had my head buried in digital tape machines. Now I wanna share some stuff with you.

REAL BASIC TIPS

- Fast-wind all tapes end to end before formatting
- Clean the heads after formatting
- Wind tapes to either end and remove from machine when not in use
- Know how to query the machine's total head hours
- Have a maintenance schedule and stick to it, or...
- You know it's maintenance time if the machine eats a tape, freezes up, and displays error messages.
- Get a humidity gauge (Radio Shack Part Number: 63-867)
- Don't smoke

Manhattan is an island surrounded by water. It ain't "Nawlins," but it can get muggy in the summer. DAT machines are pretty forgiving, but weather extremes can make your digital 8-track more temperamental than usual. In a video machine room, temperature and humidity are kept to 67 degrees and 40 percent, respectively. Too little air moisture in-



PHOTO 1

creases static electricity. Too much moisture makes the tape stick to the heads.

The typical mid-August weather in my shop/studio is 75 degrees, 49-percent humidity with the AC on. If I turned the AC off, the temperature might only rise a few degrees, but the humidity can easily jump ten percent! Pick up a temperature/humidity gauge and take note of the changes from day to day. You may find that high humidi-

ty contributes to more than just "bad hair." Try to regulate the humidity and don't forget to change the filter in the air handler. Vacuuming is also highly recommend (be sure to change that filter, too), while smoking is not.

inch artist's brush to remove the stuff that collects in this area.

In order to bring cleaner air into the machine, it must first be filtered. The filter is available from Digi-Key (Tel: 800-DIGI-KEY, part number CR214-ND, they have a minimum), but the direction of airflow must also be changed. To do so, unplug the machine. Remove the three screws on each side of the cover as well as the single screw on the cover's top/rear/middle. There is a black plastic extension rod that links the front-panel power button with the switch in the rear (see photo 1). Pull it in the direction of the front panel until it pops off. Then remove the two screws that secure the power switch subassembly to the chassis. (Photo 2 indicates all screw locations.)

There are four screws that secure

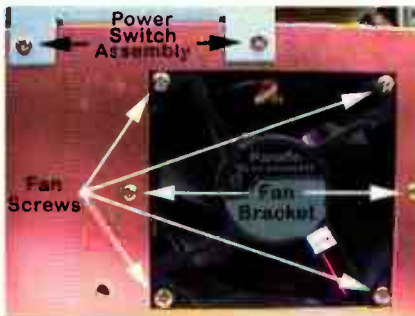


PHOTO 2

ty contributes to more than just "bad hair." Try to regulate the humidity and don't forget to change the filter in the air handler. Vacuuming is also highly recommend (be sure to change that filter, too), while smoking is not.

COOL AND CLEAN

The TASCAM/Sony digital 8-track deck has fan cooling. The fan draws air into the machine across the electronics, which is good, but it can also suck dust in through the mechanism's tape-access "port." Use the high-velocity vacuum cleaner nozzle attachment and a 1/2-



PHOTO 3



PHOTO 4

the fan to a metal frame, which itself has two screws. After all six screws have been removed, extract the fan, disconnect its power cable (see photo 3), and vacuum the dust that has collected on the blades. Flip the fan's direction, reconnect and remount with the power connection on the "inside."

Mount the air filter to the machine's cover using pan head (the type that countersink) #6 screws (see photo 4). For extra safety, paint the threads with nail polish (preferably red or purple) so that the nuts don't come loose and get sucked into the power supply (see photo 5). Be sure to clean and/or replace the filter from time to time.

TAMING THE HOT ROD

All ADATs, regardless of brand name, are made by Alesis. This is an odd but generally good thing. Some transports are noisier than others, particularly in fast-wind modes. One client described it as sort of a "hot rod" sound. The two culprits

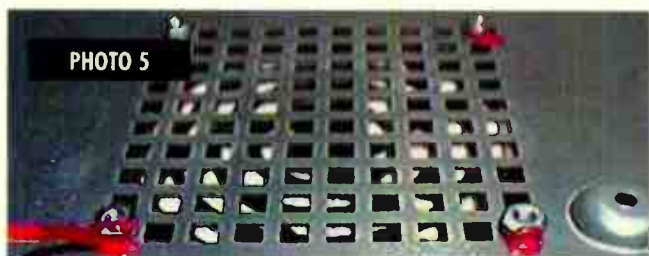


PHOTO 5

in the ADAT mechanism are white plastic rollers (see photo 6). At the top left is an "Impedance Roller" that stabilizes the tape on its way to the head. At the bottom right is a pulley on which a circular magnet is mounted. When this "Hall Effect" pulley is linked to the take-up reel table via belt, it generates a tachometer signal that corresponds to tape travel.

Noisy rollers should be replaced, but a little lubricant will shut 'em right up. Both must first be removed before lube can be applied. (Power down and unplug before removing the cover.) A white plastic cap is pressure fit over the Impedance Roller spins. Use a flat-blade screwdriver as a wedge to lift the cap. Then, *gently* squeeze the cap with a serrated-jaw long-nosed pliers, alternating clockwise and counter-clockwise while *gently* pulling (see photo 7). (Did I mention the concept of being gentle?)

Let the metal shaft enter a tube of "Lubriplate" (MCM, Tel: 800-543-4330, part number 20-1325) so that a light coating is left behind. Replace the roller and gently slip on the cap until there is minimal vertical "play" in the roller. Clean the roller with a lint-free cloth dampened with 99-percent alcohol.

To access the magnetic roller, it is necessary to power the machine and coax it to lower the tape loading "elevator." This can be done two ways: via either software or very talented hands.

The soft approach:

- Press Record 1 and Record 7



Impedance Roller "Hall" Roller

PHOTO 6

while powering up.

- The front panel should display "ProG."
- Press Pitch \bar{Y} until the display indicates "CAP."
- Press Auto Play to extinguish the decimal point.
- Press Pitch \bar{I} to lower the elevator.

On some transports, the tape sensing latches will keep the elevator from moving, hence...



PHOTO 7

DIGITAL TAPE MACHINE HIDDEN FEATURES

Machine	1st Key Stroke	2nd Key Stroke	3rd Key Stroke	Function
ADAT	Set Locate & Stop			Drum "On" Time
ADAT	Set Locate & FF			Software Version
ADAT-XT	Set Locate & Stop			Drum "On" Time
DA-88	* Stop & Play			Total Drum Time
DA-88	* Stop & FF			Fast Wind Time
DA-88	* FF, Stop & Play	** Stop	Remote	Bargraph for tracks 1 & 2 will indicate errors for A & B heads when in "Play."
RC-848	While logo is displayed	Rew, FF & Stop	•First B'day	Should have v. 2.04 or higher

* The DA-88 requires the user to press these keys on Power-Up.

** Press STOP immediately after the machine is powered. The alpha-numeric display should indicate "test" mode. If so, proceed to the next keystroke.

• After installing new firmware, a "First Birthday" is required to initialize the system. Set all S1 DIP switches to On, power up, and set all S1 DIP switches to the Off position.

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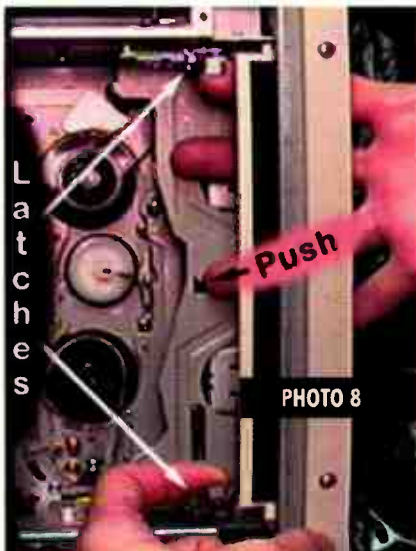


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CIRCLE 98 ON FREE INFO CARD

WORKSHOP MAINTENANCE



The talented hand approach: As per photo 8, position the right hand and fingers as shown to disengage the latches. Power up and move the hand forward as if it were a tape. Power down as soon as the elevator is lowered. Remove power, locate the magnetic roller, and remove the belt. The roller is held in place by a split plastic washer. In years past, this type of snap-washer was made of metal and formed into the shape of a "C" or "E." Extraction typically required the user to invoke the name of a deity, especially if the washer flew off into the Irish town of O'Blivion. If you've had too little or too much Cappuccino, take the machine to a qualified service center. Otherwise...

A jeweler's flat-bladed screwdriver can be inserted into the split. A slight twist will open the washer, while a second screwdriver keeps the washer from achieving orbit (photo 9). Fine tweezers or needle-nosed pliers can be used to safely remove the ^#%@\$ washer. Apply lubricant in the same way, replace the roller, split-washer, and belt (if the belt appears "glazed," replace it). Apply power. The elevator should automatically be returned to the "ready" position. Insert a noncritical tape, check play, and fast-wind in each direction. The machine should now be much quieter.

GENERALLY SPEAKING

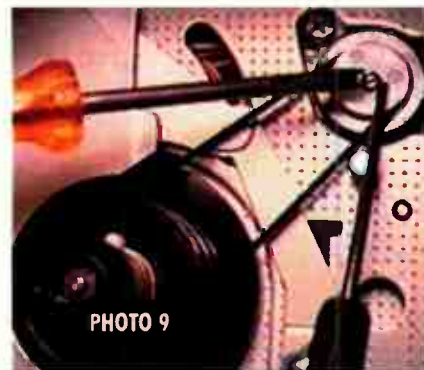
All tape machines suffer from transport-related problems. As mentioned in pre-

vious columns, the electronics are nearly always very stable. The keys to reliable transport operation are the "Mode" and "Load" switches. These are sensors that report transport status to the system control circuitry. Dirty and worn switches generate misinformation, a.k.a. error messages and eaten or jammed tapes. If this happens to you, don't let it happen more than twice. It's time for service.

SCHEDULING MAINTENANCE

Schedule maintenance every 250 hours. This is typical for the video transports used in digital tape machines. All digital 8-track decks have built-in counters that accumulate the time tape is on the heads. There are no buttons labeled "Total Head Hours." In all cases, a combination of magic buttons must be pressed to gain access to the digital netherworld.

The Panasonic SV-3700/3800 (which has a recessed, thermometer-type hour counter on the rear panel) requires the user to press "Mode, Reset, and Pause" buttons to access such need-to-know items as status (consumer or pro) and error rate. TASCAM machines must be powered up while the magic keys are pressed. (See the table 2 for your machine.)



WARRANTY COVERAGE

TASCAM's DA-88 warranty is currently 90 days for labor and one year for parts. In August, Alesis sent a warranty upgrade to all of its ADAT XT customers. Now increased to 1 year parts and labor, it was formerly 90 days for labor/head assembly and one year "free of defects."

The XT head-stack is warranted for 1 year or 1500 hours. TASCAM's expected head life is 1000 hours. **EQ**

TABLE 1

DESCRIPTION	PART NUMBER
Impedance Roller with Base Assembly	7-14-0024
Magnetic "Hall Effect" Wheel	7-14-0018
Belt for Hall Sensor Wheel	7-14-0017

Ad INDEX *For fast and easy information use the reader response card in this issue*

PAGE	BRAND	INFO#	PHONE#	PAGE	BRAND	INFO#	PHONE#
50	Acoustic Science Corp.	1	503-343-9727	61	KRK	46	714-841-1600
117	AdB International	141	404-623-1410	121	Kurzweil	150	310-926-3200
2, 67	Alesis	2, 3	800-5-ALESIS	146	Leatherman Tool Company	47	800-847-8665
35	Amek	5	818-508-9788	51	Lexicon	48	617-736-0300
20-21	Aphex	4	818-767-2929	16-17	Mackie Designs	51	206-487-4333
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81	Applied Research & Technology	6	716-436-2720	88	Markertek Video Supply	50	800-522-2025
100	Ashly Audio, Inc.	7	716-544-5191	144	Martin Audio Duplication	53	800-553-8906
103	Audio Technica	8	716-544-5191	146	Media Store	54	800-555-5551
115	Avalon Design	10	714-492-2000	145	Microboards	55	800-646-8881
95	AXI-Dynaudio Acoustics	149	617-982-2627	70	Millennia Media	56	916-363-1096
46	Azden Corporation	13	516-328-7500	92	Misson Recording	57	770-599-0681
148-151	B&H Photo	11	212-807-7474	155	Oasis	XX	800-697-5734
69	BASF	12	800-225-4350	68	Optofile	58	905-469-8080
10, 53	BBE	96, 91	714-897-6766	23	Otari Corporation	59	415-341-5900
145	Beatboy Drum Sequences	14	800-838-BEAT	5, 45, 71	Peavey	62, 61, 64	601-483-5365
77	Behringer	9	516-364-2244	10	Peninsula Marketing	67	310-373-9129
145	Bell Electronics	15	903-784-3215	82	Polyline	68	847-390-7744
3	beyerdynamic	17	800-293-4463	93	PreSonus	63	504-767-7887
82	Cabletek Electronics	18	604-942-1001	132	Pro Sound & Stage Lighting	69	800-672-4128
14	Caig Laboratories	19	714-897-6766	123	Q-Sound	148	415-842-7600
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50	Creamware	23	800-899-1939	144	Ridge Runner	71	800-FRET-PRO
91	CTI Audio	21	800-762-9266	83	Rockford/Hafler	72	800-366-1619
119	dbx	146	801-568-7660	89	Roland	66	213-685-5141
38-39	Digidesign	24	415-842-7900	163	Sennheiser	73	203-434-9190
102	Disc Makers	25	800-468-9353	28	Shure Brothers	95	800-25-SHURE
66	Discount Distributors	26	516-563-8326	85	Sonic Foundry	74	800-57-SONIC
75	DOD Electronics	90	801-566-8800	92	Sound Deals	75	800-822-6434
135	E-mu Systems	142	408-438-1921	55	Soundcraft	60	818-893-4351
136	East Coast Music Mall	97	800-901-2001	125	Spirit by Soundcraft	145	615-399-2199
96	Electro-Voice	36	616-695-6831	76	Stewart Electronics	76	916-985-7200
145	Empire Records	27	716-871-3475	60	Studer Revox	78	818-703-1100
145	Europadisk	29	212-226-4401	101	Studiomaster	80	714-841-4227
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111	G-Prime	35	212-765-3415	99	Telex Communications	87	612-884-4051
144	Geoffrey Daking & Co.	37	302-658-7003	142	The John Hardy Company	143	847-864-8060
109	Giltronics	38	302-658-7003	66	The Recording Workshop	88	614-663-2544
94	Grandma's Music & Sound	39	800-444-5252	57	TL Audio	89	905-420-3946
94	Hohner Midia	40	707-578-2023	105	Vega	84	818-442-0782
107	Innovative Quality Software	45	702-435-9077	113	West L.A. Music	151	310-477-1945
130	Institute of Audio Research	98	212-777-8550	12	Whirlwind	92	716-663-8820
144	International Audio	41	708-734-1695	146	World Records Group	100	800-463-9493
25	Iomega	42	801-778-3712	13, 32-33	Yamaha Pro Audio	93, 94	714-522-9011
164	JBL Professional	XX	818-895-8190	37	Zoom Corporation	99	516-364-2244
144	Klarity Kasette	43	800-458-6405				
26-27	Korg USA, Inc.	44	516-333-9100				

EQ&A

continued from page 14

BULKING UP

Q I am using a TASCAM DA-88 that sounds very thin. Am I doing something wrong? Also, how do I get wide images in my recordings with the DA-88? I have a full selection of excellent gear, including a TASCAM M-3500 mixer and DA-30 DAT; Lexicon, Drawmer, Aphex, Yamaha, and Ensoniq processors; AKG C414 mics; Genelec monitors; and Roland, Korg, and Ensoniq musical gear. What's the secret?

Achmad Khadafi
via Internet

A A "thin" sounding recording, regardless of whether the recording medium is analog or digital, can be the result of numerous factors working alone or collectively. This phenomenon can result from inadequate record levels, an inappropriate microphone for any given task, improper use (placement) of the microphone during recording, excessive compression (which can make a recording sound "small") and a host of other gremlins.

[You may want to do some basic technical checking before moving on to the more production-oriented tips listed below. For ex-

ample, are you placing your mics in such a way that they are receiving the same information and the resultant signals are acoustically canceling each other? This would contribute to a very thin signal (or no signal...). Adjust your mic position and check the phase on the mics by flipping the polarity switch on your console. Next, check the monitor speaker polarity by making sure the speaker wires are consistently wired. Play back a commercial CD through your system and listen for that thin sound. If it's still there, deal with the monitor/console chain first, specifically the speaker wiring. Also, listen to hear if all tracks or just one or two tracks are the thin culprits. If a single track is the problem, check your connections to the machine as you could have wiring or connector problems that could adversely affect the low end of your signals (it's unlikely every track would have a wiring problem, but don't discount it...). —HGL]


When we listen to a finished recording, we really have no idea how many tracks were used for any given component of that recording. As an example, one trick to "fatten up" a vocal track is to record multiple takes. While each take is remarkably similar to the previous one, there are slight deviations from one performance to another that create a natural chorusing effect when played back collectively. With a clean recording console

and good recording technique, you might experiment with several vocal takes and then bounce them down to one track of your DA-88.

By employing signal processing, you might consider adding some chorus to fatten up a track. Rather than returning the processor's output to an effect return, try bringing it in through a normal input channel so that you have full control over EQ and panning. Try panning the "dry" signal slightly left or right while the "wet" signal from the processor gets panned an equal amount in the opposite direction. Solo both inputs and make certain that both signals are matched in terms of level.

The real crux of the matter, however, is good recording technique and a healthy spread of your recordings various components throughout the stereo field. Make every effort to ensure optimum record levels. For a vocal recording, use the best microphone you can get — even if you must borrow or rent it — and pay particular attention to its placement. Before you begin your session in earnest, listen for any audible anomalies such as odd reflections, lip smacks (got the "pop" filter?), sibilant sounds, etc. Is your room "dead" enough? Try hanging some old blankets or towels. There is much to consider!

Roger Maycock
Marketing Support Representative
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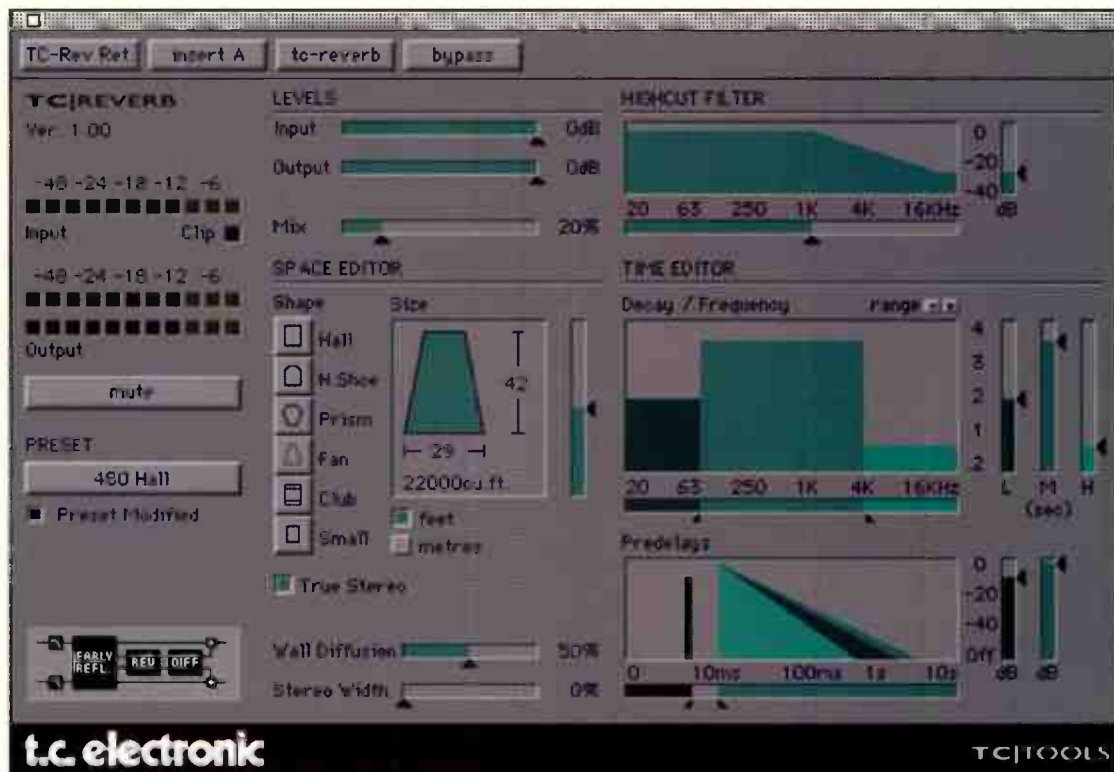
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World Radio History

TC Tools Reverb & Chorus/Delay TDM Plug In



The way they have presented the otherwise boring information such as “high-frequency decay time” is very easy to follow. At a glance you can get a very good picture of what is happening inside the DSP and how your reverb sound “looks.” It does not take very much time at all to get used to setting up new reverbs without even looking at the numbers. “A little bit less of the light green space,” becomes the kind of phrase overheard in the con-

trol room. “That looks good, let’s try it,” is heard just as often as, “That sounds good.”

LOOKIN’ GOOD

I expected the TC Tools to sound just as good as the stand-alone M5000. The TDM system does use the same DSP as in the M5000, so it seems reasonable that after interface problems are worked out that the sound should match up pretty well.

In fact, it did sound the same. I was

I KNEW IT would happen sooner or later. I have this great reverb from TC Electronic called the M5000. The problem with the M5000 is that it performs so many cool functions that you can’t decide which ones to use. When mixing in Pro Tools III, I usually connect my M5000 to one of the digital I/O ports and record the resulting reverb on another track to free up the M5000 for another task. The bad news is that after you decide that the reverb settings are not set exactly right, you have to re-record the reverb. In order to operate more efficiently, you need to have many M5000 reverbs.

TC Tools to the rescue. TC Electronic has announced a TDM plug-in that gives you a world famous TC Reverb and a TC Chorus insert that you can use within Pro Tools. If you need 17

different reverbs, then you can insert 17 TC Reverbs. As long as you have the DSP power available, you can use TC Tools as many times as you want. With external hardware reverbs, if you need another reverb, you have to go out and buy it.

VISUAL EFFECT INTERPOLATION

No, this is nothing like radial caratotomy. What TC has done is present a unique graphic window for setting the parameters in the reverb and the chorus.



MANUFACTURER: TC Electronic; in the USA contact Digidesign, Inc., 3401-A Hillview Avenue, Palo Alto, CA 94304. Tel. 415- 842-7900.

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EQ FREE LIT. #: 133

BY ROGER NICHOLS

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in hog heaven. I was able to free up my M5000 for tasks like 3-band compression and digital EQ. I was also able to have a separate TC Reverb for each instrument. Each reverb was set up with a quality that matched the instrument in question, instead of one main reverb for the whole mix with individual sends from each instrument. You can still use the "send-receive" setup if you want, but I have never seen anyone with access to a whole bag of potato chips eat just one.

A nice solo classical guitar sounded great with a medium large room and 70 ms of predelay. Changing the absorption of the walls allows very fine adjustments to the quality of the reverb and how it ties to the guitar. Drums in a garage? How about a nice 315-car garage?

Usually you can tell about the quality of a reverb by seeing how small you can make the room before the reverb starts sounding like fingernails on a chalkboard. No matter how small you set TC Reverb, the ambience maintains a rich quality that is going to be hard to beat. [The mono-/stereo-In, stereo-Out TC Tools permits assembling ambiences from six different rooms — Club, Fan, Hall, Horseshoe, Prism, and Small.]

The TC Chorus was equally great sounding. The results were dense and smooth without strange side effects that you hear from even some rather expensive stand-alone chorusing devices. The available parameters, along with the graphic-setting display, made TC Chorus the easiest chorus to set up I have ever used. When recalling various chorus presets, the graphics display made it readily apparent what the differences were between them. Seeing all of the parameters at once made it easy to discover what sonic changes were caused by what parameter changes.

CONCLUSION

Your first question to yourself should be, "What am I going to do with all the money I save?" Yes, you have just saved thousands of dollars by not having to buy 17 TC M5000 reverbs. You just have to get one copy of TC Tools for Pro Tools TDM. It could be one of the best things you ever did with your money, except maybe sending me the 15-percent commission on the money you saved. EQ has a mailbag waiting, and has promised that they will forward all but a small handling fee. **EO**

Hughes & Kettner TubeMan Plus



MANUFACTURER: Hughes & Kettner Inc., P.O. Box 2297, Des Plaines, IL 60017. Tel: 800-452-6771.

APPLICATION: Guitar preamp, with distortion, for live or studio.

SUMMARY: This well-thought out 3-channel preamp delivers a collection of great tube tones — just don't expect exceptional flexibility.

STRENGTHS: At home on stage and in the studio; rich, creamy distortion sounds; easy to use; solid construction; footswitch included.

WEAKNESSES: EQ shared by all channels; wall wart power supply; nonprogrammable.

PRICE: \$499

EQ FREE LIT. #: 135

BY CRAIG ANDERTON

I LIKE THE flexibility of multieffects, but there's much to be said for simpler boxes that pick a limited number of tasks and do them extremely well. Hughes & Kettner have that act down — their TubeMan (reviewed in March '96) is painless to use, but the sounds are wonderful. The TubeMan Plus gives more options for tweakers, and is also more oriented toward playing live.

This 1U box has a mono 1/4-inch input and two 1/4-inch outs, one for feeding a power amp (flattest response) and one with an associated switch that selects between "to mixer" (includes the H&K Red Box cabinet simulator) or "to guitar amp" (slightly less bright). You can use both outputs simultaneously.

TubeMan Plus has three basic voicings: Clean, Crunch, and Lead, each with

its own output level control. For live use, a footswitch (included) lets you move instantly between the three sounds, while front-panel LEDs indicate which sound (or bypass) is selected. A single control sets gain for both Clean and Crunch, while a front-panel switch (paralleled on the footswitch) selects between the two sounds. The lead has its own gain control, in/out switch (also on the footswitch), and a "lead 2" push-button that gives a "meatier" timbre. A bypass function is available from the footswitch, but not the front panel.

The input stage is very well designed. Turning your guitar's volume control gives a smooth, even change in response, and any loading is negligible. A mid-boost switch located next to the input changes the master timbre for all sounds.

The 4-band EQ (bass, mid, treble, and presence) affects all channels. The controls are very gentle, like what you'd expect from a '50s guitar amp. I particularly liked pulling back the presence and pushing the treble a bit with rhythm, and taking down the treble but boosting the midrange on lead. However, since you can't program different settings, for live use it's necessary to choose EQ settings that work with Clean, Crunch, and Lead sounds.

Inside, there's a 12AX7 running with 170 volts on one plate and 210 volts on the other. ICs (for the input stage, midrange boost, and outs) are 5532, TL071, and TL074 — all good stuff. Two CMOS ICs provide the switching. The box is solidly built, with the only weakness being the wall wart-style power supply.

If you need a selection of vintage tube amp sounds, TubeMan Plus is an overachiever. The timbre is creamy yet with an authoritative edge, and there's a transparent quality that provides a clean, defined tone. The footswitch is a plus for live use, and aside from the wall wart, TubeMan Plus seems ready for the rigors of the road. Overall, this is a solid performer — the more you play it, the more you appreciate just how many great sounds you can coax out of this well-designed, and very musical, box. **EQ**



IN REVIEW

TL Audio PA 2 Dual Tube DI and Microphone Preamp



THE TL AUDIO PA 2 combines tubes and solid-state circuitry to give two channels of mic preamp and instrument DI. All the action, including connectors, happens on the front panel of this 2U rackmount.

The mic input has a solid-state, electronically balanced input amp that passes through one-half of an ECC83/12AX7 twin-triode tube as a second stage to add tube character. Instruments get two cracks at a tube stage and impedances can be switched to match guitar (high gain and very high impedance) and keyboard (moderate gain and line-level impedance) inputs. A solid-state balanced XLR output stage completes the picture.

Mic inputs are on XLRs with switch-

able phantom power, while instruments, selected on a switch, come in on unbalanced jacks. All signals pass through a gain pot with an associated peak LED of the variable intensity type. This LED starts to glow when the tubes pass the threshold of compression and then increases in brightness until it maxes out at full intensity when 10 dB of headroom remains before clipping. For DI'ing guitar, you'll want to be working this LED or you'll be sparing the tube — and the indicator works best as an indicator of tube condition because it's hard to judge level by.

Many people don't even own a DI for recording guitars as they're usually coming in on a mic or through some fancy guitar preamp/effects unit. Even

fewer use DIs on keyboards, which is strange when you consider the disparity in their output. Many synths are extremely low level and don't begin to tax a console's peak light even with everything in the chain on full. DI'ing the keyboards cures this and also employs the mic circuitry of the console, which, particularly on "affordable" desks, can offer significantly better quality than its line input counterpart.

In addition to improving noise performance in the sound chain, DI'ing keyboards lets them sound their best, as they seem to "breathe" a little more freely. Guitars also benefit from DI, especially if you're after a cleaner sound, but throw in some tubes and things really get interesting because on this unit you can overdrive in a gentle or hard way.

Guitar performance is excellent — smooth and rounded and infinitely better than the usual run-of-the-mill DI box. This is because you can thicken the signal with higher gain settings. (It's no fuzz box, though.)

The mic preamp is good and similar to that found on other TL Audio units. The keyboard input can also be used to process line-level inputs, so you can get the tubes working on stereo mixes.

This is a damn good guitar DI that is flexible enough to "tube" a variety of different sources.



MANUFACTURER: TL Audio, Tony Larking Professional Sales Ltd., Letchworth, SG6 1AN. Tel: 44-0-1462-490600. Distributed in North America by Sascom Marketing Group, 34 Nelson Street, Oakville, ON L6L 3H6, Canada. Tel: 905-469-8080.

APPLICATION: Project and commercial studios; live sound.

SUMMARY: Dual-channel tube DI and mic preamp.

STRENGTHS: Tube character; can handle a variety of inputs; you get mic preamps, too.

WEAKNESSES: Peak LED difficult to judge.

PRICE: \$595

EQ FREE LIT. #: 134

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EQ TRACKS

continued from page 34

For the cellos, the mics were down in front of the f-holes, about a foot and a half away from the instruments. The violin mics were up about two feet over the tops of them and the violas were miked the same way.

How did you physically arrange the players?

You could barely fit ten people in the room. The violins and violas were in the same room, but the cellos might have been in a drum booth. I have done it both ways.

Any leakage problems?

You could kind of hear a bit of the other instruments on a given track. But the "signal-to-noise" from one instrument to the other was enough that if you needed more of one part you could turn it up. The other leakage that you'd hear on a track didn't affect the sound that much. There was bleed, but the takes were performed all together, so it didn't really matter.

What mic preamps did you use?

We had a couple of API mic preamps that I used on the violins and then we had two SSL outboard mic preamps. Those were the only outboard mic preamps that we had at the time, so we ran the rest of the mics straight into the console, which was a DDA AMR 24.

What was the tape machine?

We had only one 24-track machine and it was a Sony JH24. We had to make a slave reel using the rhythm tracks from the master tape. We had Sound Tools at that time, so we sync'd Sound Tools to the master and did a mix of the tracks into Sound Tools. Then we put that onto another reel of tape and recorded all the strings on that tape.

The strings took more tracks than we had available on the master. We ended up using up around 20 tracks for the strings. After the slave reel was done, we bounced each part to a separate track on the master. All of the first violins were bounced to one track, and all of the second violins were on another. We'd put them into Sound Tools and then fly them back to the main reel. So on the master reel there was one track of first violins, one track of second violins, one track for the violas, and one track of cellos. Then we had separate tracks for the stereo rooms mics. **EQ**

E-MU DARWIN

continued from page 116

to ADAT. Furthermore, this is a backup you can actually play. Going in the other direction, once ADAT tracks are in Darwin, you can edit away, then bounce back to tape.

While doing transfers with a BRC-based system, it's important to set the BRC to external clock (even though the BRC is always the master in a Darwin/ADAT setup). This causes it to search for an external clock, not find it, and instead sync to its own phase-locked 48 kHz clock. Otherwise, according to E-mu, the BRC's regular variable speed clock has enough jitter to add noise to digital transfers. (This is another good reason for sticking with 48 kHz.)

SO WHAT'S THE DEAL?

If you have an ADAT and plan to expand, you could add another ADAT and BRC to gain another eight tracks, the ability to do some hard-disk-style editing (by offsetting the two machines and dropping parts into tracks), and do what Alesis calls "megatracking" (using multiple cassettes per project, such as recording rhythm tracks on machine 1, then inserting a cassette for vocals in machine 2, recording eight tracks, and bouncing them down to one track on machine 1).

For somewhat more bucks, Darwin also adds eight tracks, but the editing and "megatracking" is faster and more sophisticated than with tape. It's an attractive combination; duplicating Darwin with a personal computer-based system (e.g., Pro Tools with an ADAT interface) would be fairly expensive, and wouldn't necessarily function as an ADAT slave or work with a BRC. However, unlike computer-based editors, editing on Darwin is more at the arrangement level than the note level. If you're looking for editing precision and processing, Darwin is not your best choice.

But if you just want to set up and let 'er rip, then push tracks around and perfect things "offline," the E-mu Darwin/Alesis ADAT combination delivers the goods. If you're an ADAT owner and debating whether to convert over to hard-disk recording, marrying ADAT and Darwin produces a synergistic team that capitalizes on the strengths of both technologies: easy capture, cheap storage, undo, and hard-disk-based editing. **EQ**

YAMAHA MD4

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MIDI MEETS MD

The MD4 transmits MTC (30 fps only) and MIDI clocks (with Song Pointer) but does not slave. Sync comes from within the MD and does not require giving up an audio track. Using MTC allows for making tempo changes at the sequencer, but with MIDI clocks you can still program tempo variations with the MD4's Tempo Map function, which allows each song up to 26 tempo and 26 meter changes. Each map is saved as a separate file and needs to be reloaded whenever you start work on the associated song.

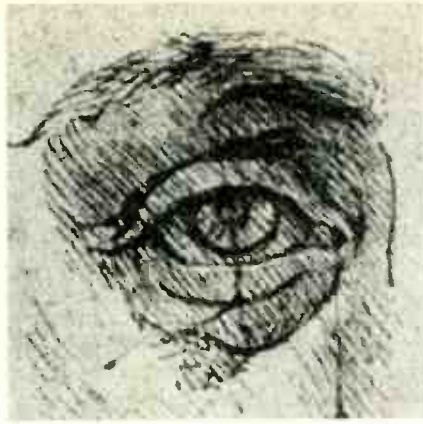
Time signatures range from 1-99 beats per measure, with rhythmic values of 1/2-, 1/4-, 1/8-, or 1/16-note. Tempo ranges from 20 to 300 BPM. Creating a tempo map is a tedious process, but you can easily insert or delete changes.

Note that there is limited memory available for tempo maps — according to Yamaha, each disc can hold four or five maps that use all 26 steps. If you use lots of tempo changes or need to change tempo between beats, edit your sequencer's tempo track and drive it with MTC.

COOL TOOL?

MD-based ministudios have a real shot at dominating the market now held by cassette-based types. While MD models are more costly than cassettes, the superior audio quality and feature set are worth it. I'm still not convinced about MD as a delivery system for consumer audio, but it seems ideal for this application, and some may actually prefer the sound of data compression to straight linear encoding. (MD should have also been the logical successor to the 3.5-inch floppy disk, but that's another story.) Although the MD4 is not all-digital — you still have to enter, exit, and bounce with analog — it nonetheless has that distinctively clean, "digital" sound. Its high-frequency response poops out a shade before 20 kHz, but that's hardly audible (if it's noticeable at all), and, of course, compared to multitrack cassettes, the high end is far superior.

Simply stated, the MD4 is not just the lowest-cost digital multitrack studio you can buy at the moment, but a quantum leap beyond its cassette-based forebears. The MD may not have caught on with consumers, but, ironically, it appears that it will indeed replace the cassette in at least one application. **EQ**



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DOUBLE TROUBLE

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its ten-foot maximum. Marty's drum riser rolls underneath the Travis set and behind it, where it can be dismantled out of the way. Marty's stage left guitar/bass riser and stage-right risers then switch sides of the stage (to where they'll be used during the Travis set and the finale). The stage then lowers to its six-foot "show" position, all the lights and band gear are visually checked, and the band members take their places.

We set up the Travis set as for the fi-

nale and walked the local crew backwards through the set change, giving them the advantage they needed to strike Marty's drums quickly. Then we checked the acoustic set, with some changes. We checked with Jon and Wendell upstage, and with Marty's guitarist Brad Davis playing mandolin upstage as well. This change solved two problems, namely getting those live wedges out of the downstage picture and saving Jon and Wendell from scrambling to their risers after the set. We also closed the drape during the check. This tiny detail had somehow been ignored until Tritt backline tech Gary McMurray pointed out that problems always occurred after it was closed.

That night the sets went seamlessly one into another. Shows since have been similarly smooth. Now we check the acoustic bit religiously, drape closed and PA running. It seems what we had to do was to fall back on the basic rules of live audio, the first of which is: "Start at one end and work to the other. It works with signal flow and sound-checks." I guess the trick is knowing which end to start with.

Jon P. Armstrong is currently on the Double Trouble '96 tour mixing monitors for Travis Tritt.

DSP•FX REVIEW

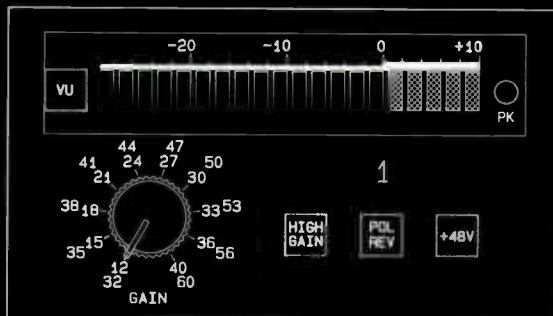
continued from page 126

D/A, and AES/EBU and S/PDIF ports (\$599 and \$299 for AES and S/PDIF daughterboard, also available separately) should be shipping as this issue goes to print. However, the ease of installation should allow even the less adventurous computer owner to stick the Basic System in a PC and be up and running as quick as they can get the cover back on. The ISA card is typical of the high-quality versions of other PC products, with easily accessible address switches and clear instructions for setting them. Many PC users cringe at the thought of adding a board into their computer based on previous experience. Thankfully, the DSP•FX wasn't even a problem to install in my fully loaded Pentium. No conflicts, no software problems, and it runs fine in Windows 95 (although it is a 16-bit Windows 3.xx program).

The DSP•FX ships with a large number of presets for each of the five plug-in modules, and this will probably increase as the user base grows. The size of the preset files are very small (between 400 and 1400 bytes), and therefore practically unlimited in number. The DSP•FX is a powerful DSP engine, and we can look forward to many other applications for this hardware. The large dynamic range of the 32-bit DSP coupled with Power Technology's smart visual interface concepts should prove to be an interesting combination.

Wade McGregor is a senior consultant for Barron Kennedy Lyzun & Associates, an acoustical consulting firm based in Vancouver, BC. For more info, visit their home page at www.bkla.com

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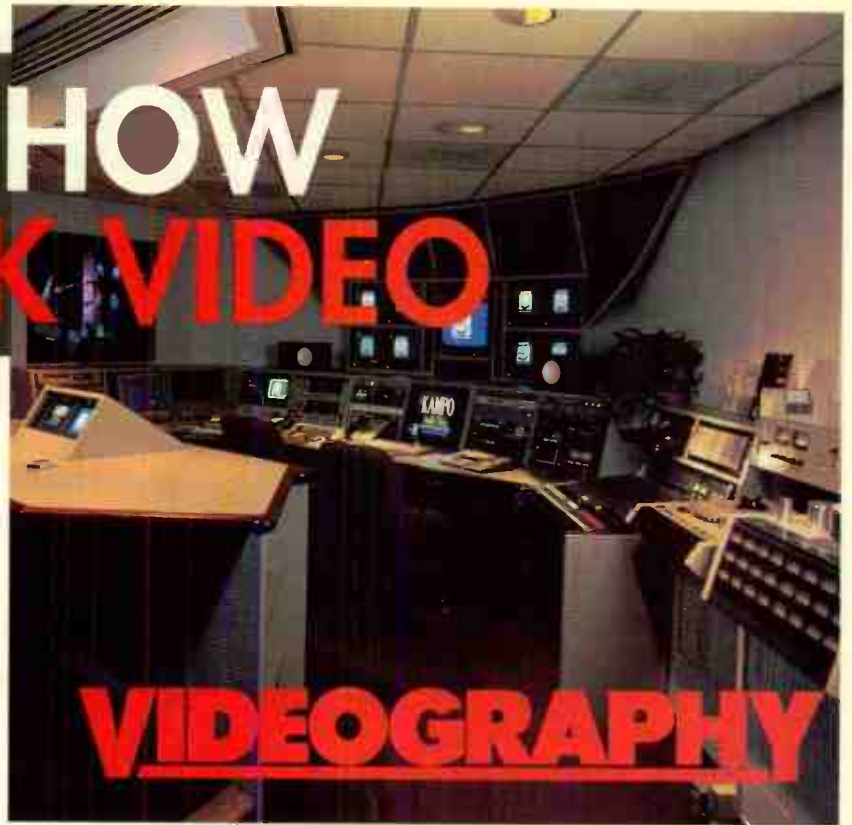
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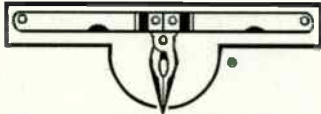
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Scams What Am

Be on the lookout
for the following project
studio equipment
scam artists.

Don't say we
didn't warn you.

BY MARTIN POLON



There was a time when commercial recording studios dominated the studio audio recording business. That time has changed is clearly identified by the existence and prominence of the project studio category. Also indicative of this trend is the current policy of record labels to support their groups in project studio ownership over using major studio session time in album preparation.

It is interesting that project studios are also sharing the bad along with the good from the world of the commercial studio operators. It seems that the scam artists who have been "working" the mainstream studio marketplace are now mining the project studio universe as well. Here are some of their 'bag of tricks' to be avoided!

1. Memory Scams: Though not exclusively the province of the audio recording studio at any level and most certainly a problem plaguing the personal-computer industry at all levels,

audio operators are being stung by fraudulent suppliers of both Level Two Cache and RAM DIMMs and SIMMs.

These cyber "bunko" artists are hanging up their shingle at computer swap meets and via second-level publications serving the computer user via direct local distribution. These phony suppliers sell the processor cache needed by PowerPC chips in Macs and by "P" series Pentium chips in Intel computers. These special chips provide the 256k, 512k, or 1 MB cache memory that the processors use to store certain instructions. They also sell main memory RAM chip sets for PCs and Macs. In almost all cases, this memory is either rejects or returns from legitimate sources or actually counterfeited dummies from Asian pirates.

The dishonest vendors avoid direct contact with their customers as well as any contact with magazines that are delivered by mail. The product that they provide is also not delivered through the U.S. Mail. So they avoid the jurisdiction of the local police and of the U.S. Postal Inspectors.

2. Microphones: This is the old "don't judge a book by its cover" scam. The microphone you buy casually at a professional meeting from a "friend of a friend of a friend" is either made from scratch in Asia of cheap materials with a Chinese cartridge in it, or it has a real case with a cheap cartridge, or it is stolen goods. In any case, you don't want it — no matter what the price!

3. Flea Markets: This is a really good place to buy a piece of studio gear with "something missing." If a piece of studio gear is intact, it can be traded in via legitimate dealers or sold via want ads in recording magazines. Someone has modified or cannibalized or "cherry picked" the best parts out of the unit in question as often as not!

4. Studio Gear Sold from the Back of Large Trucks: This is usually where you find excellent studio equipment at excellent prices. Here is where you get that professional DAT recorder you always wanted or perhaps that digital mixer. The only problem is that the units are almost always stolen directly from the maker on the way to legit deal-

ers. The people selling are not the sort you would want to take home to your family, although they frequently belong to a different kind of "family." To buy, you become a receiver of stolen goods and risk the loss of the purloined units, not to mention criminal charges against you.

5. Same as the Above but in a Parking Lot: Just as it sounds.

6. Midnight Audio Supply: In this case, the piece of equipment you always wanted but thought you could never afford walks through your front door under the arm of a "suit" or a street person. The unit has a price tag that is so low, it seems unreal. Believe that it is! The equipment in question left one of your competitor's facilities via the "five finger discount" in most cases.

Now the bottom line here is a simple one: If the deal seems too good to be true, it probably is. Remember that there just isn't that much slack in the selling price of professional audio gear to allow deals that are half or three-quarters off a specific unit's retail selling price. Buy your new equipment only via mail order using the advertisements in legitimate mainstream pro audio magazines. Patronize only retailers who are franchised to sell the products of the specific manufacturer you are interested in. When you use your credit card to pay for such equipment, you add a large financial institution to the equation that is mandated by Federal law to help you if an untoward situation develops. If you must buy used equipment, buy it from a facility or individual who is known to you.

Scam artists cannot exist without the greed of their potential victims. In looking for that great deal, you become part of the equation that will ultimately take your money from you.

Martin Polon is the principal of the Boston-based Polon Research International (PRI). PRI forecasts the electronic entertainment industry for the financial community.



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TASCAM 102 mkII / 103 Stereo Mixdown Cassette Decks



Best values for musicians, studio operators and production houses. The 102 mkII and the 103 consistently produce only the highest quality tape recorded output.

They Feature:

- 60dB signal-to-noise ratio combines with wide frequency response for high-fidelity sound reproduction using any type of cassette tape
 - Industry-standard Dolby B/C noise reduction and Dolby HX Pro sound technology extends high frequency performance up to 60dB and minimizes distortion
 - Advanced bias sensing electronics automatically chooses optimal recording settings for the type of tape you load in—Normal, Metal or CrO2
 - Record/mute autospacer automatically inserts 4 seconds of silence between songs or broadcast segments
 - Multi-function display clearly indicates transport mode, tape counter position, tape type and level indicator
 - Multi-counter with both tape counter and run-time modes
 - Independent L and R stereo level controls and master record level control
- Tascam 103 Advanced Features:**
- 3-head system allows you to record on a tape and monitor it at the same time without rewinding
 - MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction

202 mkIII Dual Auto Reverse Cassette Deck



The 202 mkIII provides high-fidelity sound reproduction and a wide frequency response, as well as a host of features that help you dub, edit, record or playback onto/from one or two cassettes easily and efficiently.

- Normal speed and high-speed dubbing
- Autospacer automatically inserts 4 seconds of silence between songs or broadcast segments for pro quality tapes
- Incorporates Dolby HX Pro sound technology to extend high frequency performance and minimize distortion on Normal, Metal and CrO2 tape
- Allows you to quickly and easily create a professional-sounding composite tape from several sources. Functions like Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks you want.
- Twin two-head cassette decks in a durable rack-mount housing that can be used separately or in tandem during recording and playback for total flexibility
- Play material on deck 1 while deck 2 records on one or both sides
- Record simultaneously on both decks from an external master
- Play back both sides of one or both decks in a continuous loop, up to five times
- Auto Reverse automatically reverses tape direction during playback and record
- Repeat rewinds tape and allows infinite looping during playback
- Timer switch for unattended record/playback (timer required)

NEW! 302 Double Auto Reverse Cassette Deck

All the features of the 202 mkIII, the new 302 adds even more recording and playback flexibility. That's because the 302 is actually two fully independent cassette decks. Both decks have their own set of interface connectors, transport control keys and noise reducing functions.

- Auto-reverse capability on both decks
- Individually simultaneous record capability—both decks
- Independent RCA unbalanced input for each deck
- Cascade and Control I/O let you link up to 10 additional machines for multiple dubbing or long playing record and playback applications

CD-601 Professional CD Player



Frame-accurate cueing precision, extremely high-fidelity and a small form factor make the CD-601 ideal for post-production applications where sound effects and music are "flow-in" from compact discs. The CD-601 integrates with most post-production equipment including mixers, video editors and computer studio controllers.

- Balanced XLR and unbalanced RCA outputs
- Precision cueing control and Auto cue
- Linear motor-driven pick-ups eliminate dead air
- Optional RC-601 remote control adds additional features and conveniences
- Optional BU-2 RAM for instant start and seamless loops up to three minutes

marantz®

PMD-101/201/221/222/430 Portable Professional Cassette Recorders



The world standard for field recording, the PMD line is also the value leader. They all feature RCA line input/outputs, 1/4-inch headphone jack, built-in speaker, pause control, audible cue and review, tape counter, full auto shut-off and low battery indicator

General Stereo/Mono	PMD-101 Mono	PMD-201 Mono	PMD-221 Mono	PMD-222 Mono	PMD-430 Stereo
Heads	2	2	3	3	3
Inputs/Outputs					
Mic Input	1/4-inch Built-In	Miniplug Built-In	Miniplug Built-In	MiniXLR Built-In	1/4-inch —
Condenser Mic Remote Jack	—	Yes	Yes	Yes	—
Modular Tel Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR	—	—	—	—	Yes
dBx NR	—	—	—	—	Yes
Mic Attenuation	—	0-10dB, -20dB	0-10dB, -20dB	0-10dB, -20dB	0-15dB, -30dB
Ambient Noise Cont.	—	Yes	Yes	Yes	—
MPX Filter	—	—	—	—	Yes
Manual Level Control Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pitch Control	±20%	±20%	±20%	±20%	±6%
Bias Fine Adj	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
Half-Speed Playback Memory Rewind	Yes	Yes	Yes	Yes	Yes

Telex ACC2000/4000 Series Cassette Duplicators

Designed for high performance and high production, Telex's ACC Series (ACC2000/ACC4000) and (ACC2000 XL/ACC4000 XL) of expandable duplicators also offer easy maintenance and unsurpassed ease of use. The ACC2000 is a two-channel monaural duplicator. The ACC4000 is a four-channel stereo duplicator. Each produces 3 copies from a cassette master at 16 times normal speed and each can expand up to 27 copy positions (with additional copy modules). With the extra copy modules, you can duplicate up to 27 copies of a C-60 original in less than two minutes. And they copy both sides at once. The XL Series feature "Extended Life" cassette heads for increased performance and wear characteristics. They also offer improvements in wiper flutter, frequency response, signal-to-ratio and bias. Additionally the ACC4000 XL allows for either chrome or ferric cassette duplication. XL- models are available in stereo (ACC4000 XL) or mono (ACC2000 XL) versions.

Fingert Operation	Easy Maintenance
• Individual rotary audio level controls allow for an increase or decrease of audio levels as the master translates to the copies.	• Slanted work surface and unique "heads-up" cassette platform allow less oxide build up on the heads and makes cassette loading and unloading much easier.
• Peak reading LED indicators allow quick and accurate monitoring of audio fluctuations.	• Each cassette position has a three point tape guidance system that eliminates skew problems. Plus, when a tape is inserted, each cassette position is activated to prevent unnecessary wear and tear on the tape head mechanism.
• Side A or B select button let you set up for duplication of either 1 side or both sides of a cassette at once.	• Audio and bias, along with head adjustments, are made easily from the top of the unit and a switch on the back engages the head and pin roller for convenient cleaning.
• Stop all tapes instantly, at any point during the copy or rewind cycle.	• Short tape indicators alert you if a tape stops before the original does, identifying incomplete copies caused by jam or short.
• Automatic or manual selection of rewind and copy operation.	• Includes removable power cord and protective dust cover.
• Rewinds tapes to the beginning or end automatically (AUTO mode) or manually—in AUTO mode the copy button activates the entire rewind/copy/rewind sequence. In manual it starts copying immediately.	• Includes removable power cord and protective dust cover.

- ACC2000 Mono Master Module:**
- 1/2 track two-channel monaural duplicator produces 3 copies from a cassette master at 30ips (16X normal speed)
 - Expands up to 27 copy positions by adding ACC2000 copy modules (four positions each)
 - Erase heads in the copy positions automatically erase existing audio as new material is being recorded
 - Track select short tape indicators, auto/manual operation
 - Includes removable power cord and protective dust cover
- ACC2000 XL Mono Master Module:**
- Same features as ACC2000 plus—Extended Life cassette heads
- ACC4000 Stereo Master Module:**
- 1/4 track four-channel stereo duplicator. Same features as ACC2000 Mono Master Module.
- ACC4000 XL Stereo Master Module:**
- All features as ACC4000 plus—Extended Life cassette heads. Can be configured for chrome or ferric cassette duplication.
- ACC2000 Mono Copy Module:**
- 1/2 track, two-channel monaural copy module.
 - Each module has four copy positions with erase heads and controls for side select.
 - LED displays indicate end-of-tape status for each pocket.
 - Includes ribbon cables for connection to ACC2000 master and other copy modules.
 - Includes removable power cord and protective dust cover
- ACC2000 XL Mono Copy Module:**
- Same features as ACC2000 Copy Module plus—Extended Life cassette heads. Connects to ACC2000 XL Master Module
- ACC4000 Stereo Copy Module:**
- 1/4 track four-channel copy module. Has all the features of the ACC2000 Copy Module
 - Same as ACC4000 XL Stereo Copy Module.
 - Same as the ACC4000 Copy Module, plus—Extended Life heads. Configurable for chrome or ferric cassette duplication.

Copypette EH Series Duplicators

The popular Copypette series produces high quality, low cost cassettes in large quantities at nearly 16 times normal speed. This means you can reproduce both sides of a C-60 tape in less than two minutes. Available in two versions, the Copypettes are capable of duplicating either one cassette or three at a time. In addition each are available in both mono and stereo models. They couldn't be easier to use. You simply insert the cassettes, press the START switch and they do the rest. They rewind all tapes to the beginning, copy, then rewind to the beginning again before stopping. The whole process can be stopped at any time by pressing the CYCLE button. Side Select feature allows you to set them up to copy one side of a tape or both sides at once.

- Stereo Copypette 1*2*1**
- Weighing only 8 lbs. (3.6 kg), this unit has a durable impact resistant housing and includes a removable power cord, carrying handle and protective cover. It also has an optical, non-reflective end-of-tape sensing system that provides gentle tape handling. A mono version is also available.
- Stereo Copypette 1*2*3**
- This duplicator copies both sides of three cassettes at once, yet it weighs only 12 pounds (5.4 kg) and includes a hard cover to protect the unit while not in use. It uses all DC Servo motors for the ultimate in reliability.

TASCAM 112 mkII Stereo Cassette Deck



The classic "no frills" production workhorse, the 112 mk II is a 2-head, cost effective deck for musicians and production studios. Extremely rugged and reliable, the 112 mk II is ideal for production mastering and mixdown. It also features a parallel port for external control and an optional balanced connector kit means it is flexible enough to integrate into any production studio.

- Utilizes Dolby B or C noise reduction with Dolby HX Pro
- Automatically selects proper bias type, so you get optimal recording & playback response with Normal, Metal or CrO2 tape
- Gear independent input dials let you dial in stereo VU calibration with one dial. You can also adjust for channel specific calibration
- Offers two Autolocator buttons and a MEMO IN control. These controls allow you to select two points on any tape for one button forward/reverse to wherever the action is. Additionally RTZ (return to zero) quickly spools the tape back to 0000 on the tape counter
- Rear-mounted RCA input/output jacks for easy connection to high-quality sources
- Optional LA-112 connector provides additional balanced or unbalanced LR inputs and outputs. Installation is simple and requires no special tool.
- 25-pin D sub connector (parallel port) on the back, links the deck to the optional RC 134 remote control unit or for loader start from any mixer that use the same protocol

112R mkII Bi-Directional Stereo Cassette Deck

The 112R mkII is a sonically uncompromising auto reversing and continuous play cassette deck. It offers the finest independent head auto-reverse design at this price level, plus it has extra dubbing and editing features that make it ideal for long program recording.

- All the features of the 112 mkII plus—**
- Three-head transport with separate high-performance record and playback heads. Manufactured from resilient Cobalt Amorphous materials, the independently-operating heads combine with precision FG servo direct-drive capstan motors to provide the highest standards of reproduction quality and performance.
 - Frequency response is 25 Hz to kHz with less than 1% total harmonic distortion
 - Equipped with Hysteresis Tension Servo Control (HTSC) the 112R continually eliminates wow and flutter. HTSC is an advanced servo control system that maintains consistent back tension on the tape all through the reel combatting inconsistencies brought on by extreme temperatures and humidity
 - Super Acculign Rotating Head System allows recording or playback tape direction to be changed with one button. A single-screw azimuth adjustment makes it easy to maintain the head alignment after many hours of continuous use
 - For unattended record/playback of material that is longer than one side of a tape, there are two features that spare you from constantly attending to the deck
 - Auto Reverse mode plays or records in both directions before stopping, switching sides on the fly
 - Continuous Reverse mode allows you to loop the tape during playback up to 5 times, or record in both directions without pausing to flip the tape and re-engage the record mechanism. Both features are accessible from the front panel, with one-button selection

122R mkII 3-Head Stereo Cassette Deck



The standard for production and broadcast facilities, the 122 mkII features smooth fail-safe tape handling mechanisms, a three head transport with high-performance Cobalt Amorphous record/playback heads and precision servo direct-drive capstan motors.

- All the features of the 112R mk II (no reverse of course) plus—**
- XLR balanced and unbalanced RCA inputs and outputs are selectable with the flip of a back-panel switch. There are 1/4-inch inputs on the front panel for simple and direct plug-in of line-level gear
 - MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction
 - Bias and level fine tuning for each channel. These tuners can be used in conjunction with the one-touch 400 Hz or 10 kHz oscillator adjustment signals to get proper VU calibration before or during each recording session
 - Record/mute autospacer automatically inserts 4 sec. of silence between songs or broadcast segments for pro quality tapes

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ALESIS 3630 Compressor

The 3630 provides two full-featured professional compressor/limiters in one rack space. Ideal for any application from studio recording and mixing to live sound reinforcement and broadcast.

- Dual mono or linkable true stereo operation.
- Choice between RMS and peak compression strives as well as hard knee or soft knee characteristics.
- Dual 12-segment LEDs display gain reduction and input/output levels.
- Each channel's built-in noise gate has an adjustable threshold and close rate to ensure clean, transparent performance.
- Variable attack and release times and a sidechain function for "ducking" in broadcast applications.

t.c.electronic Wizard M2000 Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and six different routing modes. There are 254 factory programs including reverb, pitch delay, chorus, flang, phase, ambience EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit analog conversion, AES/EBU and S/PDIF digital inputs/outputs. "Wizard" help menus, 16-bit dithering tools, Tap and MIDI tempo mode, and single page parameter editing.

- The array of enhanced shift (up to 8 voices), chorus, and delay effects are characterized by their precision and versatility. Everything from the fine and subtle to the wide and spectacular is handled with equal superiority. The algorithms in the dynamics section (compressor, limiter, expander, gate and de-esser) are unique as stand-alone effects, but are particularly useful in combination with other effects. Those might be de-esser/room, gate hall or compressed pitch. The possibilities are endless.
- Tempo Tap function lets you match effects to the beat. Tempo can be adjusted in beats-per-minute and sub-divided any way you like—even in triplets. The tempo can also be read from MIDI.
- Preset "gilding" (morphing) function ensures seamless transition between effects. Very useful in live and mixing situations.

JBL Control 5 Compact Control Monitor Loudspeaker

The Control 5 is a high performance, wide range control monitor for use as the primary sound source in a variety of applications. It's smooth, extended frequency response combines with wide dynamic capability to provide acoustic performance that's ideal for recording studios, A/V control rooms and remote trucks.

- 6-1/2 inch (165mm) low frequency driver provides solid, powerful bass response to 50 Hz and a pure titanium 1-inch dome handles high frequency response to 20 kHz.
- Both transducers are magnetically shielded, allowing use in close proximity to video monitors.
- Dividing network incorporates protection circuitry to prevent system damage and utilizes high quality components including bypass capacitors for outstanding transient accuracy.
- Molded of dense polypropylene foam, with a choice of black, gray or white finish.
- Pleasing enclosure allows it to easily fit into any environment.
- A host of mounting systems including ceiling, rack and in pod allow positioning in exactly the right spot for best performance.

4200 Series Studio Monitors

The 4200 Series are console-top monitor models designed specifically for use in the near field. Both the 6.5-inch (4200) and the 8-inch (4208) offer exceptional sonic performance, setting the standard for today's multi-purpose studio environment.

- Unique Multi-Radial sculptured baffle directs the axial output of the individual components for optimum summing at the most common listening distance (approx. 3 to 5 ft).
- The baffle also positions the transducers to achieve alignment of their acoustic centers so that low, mid and high frequency information reaches your ears at the same point in time, resulting in superb imaging and greatly reduced phase distortion.
- Curved surface of the ABS baffle serves to direct possible reflections of the shorter wavelengths away from the listening position, eliminating baffle diffraction distortion.
- Vertical alignment of the transducers across the baffle center produces natural mirror-imaging.
- Pure titanium diaphragm high frequency transducer provides smooth, extended response.
- Magnet assembly is shielded, allowing placement near magnetically sensitive equipment like CRT's, tape recorders, etc.
- Low frequency components also feature magnetic shielding making the 4200 Series monitors ideal for use in video post production facilities as well as music recording studios.

Fostex XR-5/XR-7 Multitrackers

XR-5 Features:

- High-speed (1-3/4 ips) four-track (2-tracks simultaneously) recorder with built-in Dolby noise reduction (can be turned off)
- Pitch controller varies the tape speed within a range of ±12%
- Punch in/out function makes corrections and phrase insertions when necessary, can be done easily with optional footswitch.
- Four inputs accommodate two microphones in channels one and two. Has convenient insert points for connecting a compressor/limiter and other devices for the mix channels.
- Each channel is equipped with two-point high/low shelving equalizers to help shape the sound, and an AUX send function for processing ambient system effects.
- Trim function lets you switch High/Mid/Low input levels for channels one and two.
- Alternate Mix mode lets you independently select the signal from the input track or the tape playback. Prefader effect send, inline monitor & other functions are also possible using this mode.
- Post fadback (monitor) send function routes the fadback signal to the AUX send. When the fadback is activated you can actually mixdown at the same time you add reverb to a tape



The XR-7 has all the features of the XR-5 plus—

- 6 inputs, plus the ability to record four tracks simultaneously
- Dolby B noise reduction plus dual speed recording
- During recording, channels 5 and 6 are the primary inputs for microphones and acoustic instruments. They have trim controls and mid-sweep EQ. During mixdown, these channels act as the main stereo L/R bus.
- Auto rehearsal mode lets you concentrate on the music instead of the machine.

TASCAM PORTA 03 mkII Ministudio

The easiest way to get into multitrack recording, the PORTA 03 is an extremely economical 4-track recorder that lets you record as well as mixdown to standard cassettes.

- 4-track recorder with integrated two channel mixer
- Two 1/4-inch MIC/LINE inputs with trim control
- Extended dynamic range with Dolby B noise reduction
- 3-digit tape counter keeps track where you are on the tape
- Master level control for the entire mix, and the level send to LINE OUT for stereo mixdown
- Track selector indicates which of the 4 tracks you're recording to



PORTA 07 Ministudio

The PORTA 07 packs high-end features into a compact and economical package. Achieves great sound with high speed tape transport, high-low EQ and DBX noise reduction.

- 4-track recorder with integrated 4 channel mixer
- Two 1/4-inch LINE inputs and two 1/4-inch MIC/LINE inputs with trim control
- Separate high and low EQ for each track provides 10dB of boost or cut.
- dbx noise reduction for improved signal-to-noise ratio.
- Punch-in/out manually or with optional RC-30 footswitch.
- Effects send with stereo return can be applied in varying amounts to all four channels



424 mkII Portastudio

The 424 is premium Portastudio that takes multitrack recording to the next level. Features superior audio quality, balanced XLR inputs, enhanced equalization and a big-studio style AUX section.

All the features of the PORTA 07 plus—

- 4-track recorder with 8-input mixer (4 mono MIC/LINE inputs with 1/4-inch and balanced XLR jacks and 2 stereo inputs with 1/4" jacks)
- Separate 3-band EQ section for each of the four mono channels with 10dB of boost or cut and repeatable midrange
- Auto Punch in/out with rehearsal, plus a Slew switch lets you set up a tape loop that goes over the same area of a tape while you practice your punch-in/out; and overdub moves—without committing a single note to tape
- Two independent dedicated AUX sends let you use more effects or use one as tape cue during tracking



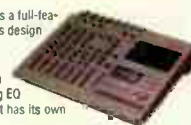
MIDI Musicians Take Note—if you've got MIDI keyboards, drum machines and sound modules in your set up, you can exploit the power of virtual tracking with either the PORTA 07 or 424/464/488 Portastudio. You can use a MIDI synchronizer like the TASCAM MTS-3D MIDI-Tape Synchronizer to record (strip) a code onto track 4 (track 8 with the 488). Just select SYNC mode on the DBX switch and record the tone to tape. After stripping the tape with FSK or Song Position Pointer information, all your MIDI instruments will faithfully follow the tape during playback and recording, even if you slow or speed the tape using the PITCH controls. The big benefit is that your MIDI tracks (called virtual tracks) don't actually have to be recorded onto final mixdown, giving you lots more unused tracks to record on.

464 Portastudio

The functionality of a pro recording studio in a small, lightweight package, the 464 Portastudio is a full-featured eight input, four-track cassette recorder complete with a 12x2 internal mixer and dual buss design that lets you create separate recording and cue mixes.

All the features of the 424 mk II plus—

- 4-track recorder with 12-input mixer (4 mono MIC/LINE with 1/4-inch and balanced XLR jacks, 4 stereo 1/4" jack pairs)
- Channels 1-4 offer High and Low shelving EQs and a sweepable Mid EQ. Tracks 5-6 and 6-7 have shelving EQ only, while 9-10, 11-12 are best used with input that has its own internal EQ.



488 mkII Portastudio

When 4 tracks are just not enough then you need the perfect creative tool—the 488 mkII Portastudio. The most cost-effective 8-track recorder on the market, the 488 not only offers additional capacity but versatile capability and intuitive operation for easy capturing & manipulation of your ideas.

Whether recording acoustic or electronic instruments or vocals, the 488 offers maximum creative freedom to produce your best work. With all the functionality of a professional studio, the 488 may be the ultimate demo recording machine.

All the features of the 464 mk II plus—

- Includes phantom power for use with high-quality condenser microphones.
- Built-in mixer features: low-noise circuitry, with 12 inputs and 2 group busses. There is a separate input for your stereo master recorder.
- Each of the 8 main input channels includes individual 3-band equalizers. You get Hi and Low shelving EQs, plus a semi-parametric sweepable midrange EQ
- Unique multi-mix mode with the capability of handling up to 20 inputs at mixdown.
- The only 8-track cassette that offers a servo controlled tape transport complete with electronic braking. Equipped with a high-performance Hysteresis Tension Servo Controlled (HTSC) tape transport, the 488 delivers better sound than the first 8-track reel-to-reel machines.
- HTSC maintains precise and consistent tape tension from the beginning until the end of the tape. It actually dynamically adjusts the back tension on the tape as it moves from one end to the other, allowing precise locating capability.



ALESIS Monitor One

Near Field Studio Reference Monitor

Designed by engineers with decades of experience, the award winning Monitor One provides the last critical link in the recording studio's signal chain, giving you an accurate reproduction of what is being recorded.

- Delivers excellent image and transient reproduction, powerful bass, and smooth, extended high frequency detail.
- Exclusive SuperPort speaker venting technology eliminates the "choking" effect of port turbulence for solid high-power bass transients and extended low frequency response.
- Ferrofluid cooled 1" silk-dome driver eliminates the harshness and ear fatigue associated with metal or plastic tweeters, making it easy to mix on for extended periods.
- Monitor One's powerful bass incorporates a proprietary 6.5" low frequency driver with a mineral-filled polypropylene cone and a 1.5" voice coil wound on a high-temperature Kapton former
- They come in a mirror-image left/right pair covered with a non-slip rubber textured laminate for stable mounting

Monitor Two

Mid Field Studio Reference Monitor

With much of today's popular music demanding more bass at louder volumes than a small near field monitor can possibly produce—the Monitor Two delivers—at a price no higher than many of these smaller speakers.

- Utilizes a 10" three way speaker design with a unique asymmetrical crossover to maintain the same accurate tonal balance and imaging of the Monitor One—but with a much larger sound field.
- 10" low frequency driver incorporates Alesis' SuperPort speaker technology to provide powerful, extended bass.
- 5" mid frequency driver offers exceptional mid frequency detail
- 1" silk dome high frequency driver delivers a broad but natural frequency response from 40Hz to 18kHz
- Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy



TANNOY PBM Series II Reference Monitors

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



PBM 5 II

- Custom 5" injection-molded bass driver with a nitrile rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- Woofers blends seamlessly with the 3" 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 mdfite for minimal resonance and features an anti-diffraction radiused front baffle design

PBM 6.5 II

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

PBM 8 II

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

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SPiRiT FOLIO LITE

Compact Professional Mixing Console

- 12 inputs as standard (up to 16 at midxdown)
- 4 mono channels & 4 stereo channels
- Inserts on all mono inputs and mix outputs
- Ultra low-noise (-129 dB EIN) mic inputs
- Musically responsive 2-band EQ
- 2 Aux sends on all channels, Aux 1 switchable pre/post fader
- PFL Solo on all inputs, dedicated tape return
- Headphone socket and discrete L/R outputs for monitors
- 10-segment bar graph metering
- Consistent high performance controls, global phantom powering
- Optional rack mounting panel and PortaPower Unit



FOLIO SI

Stereo Input Mixing Console

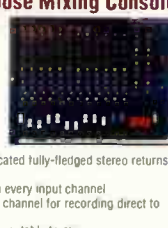
All Features of Folio Lite PLUS—

- 18 inputs as standard (20 including stereo returns)
- 8 stereo channels and 2 mono channels, with 60mm faders
- Comprehensive 3-band EQ on inputs 1-14
- High pass filter on mono inputs
- Dedicated tape return and control room outputs
- Insert points on L and R master outputs
- 12-segment bar graph metering
- Main outputs are ground compensated and impedance balanced
- Free standing or rackmount versions available
- Optional Porta Power unit allows battery powered operation from various sources

FOLIO RAC PAC

4-Bus Multi-Purpose Mixing Console

- 14 input channels with up to 28 inputs at midxdown
- 2 stereo inputs with 60mm faders and 2-band EQ
- Low-noise (-129 dB) mic inputs
- Comprehensive 3-band EQ with sweep! Mid, plus high pass filter on every mono input
- 6 versatile Aux sends, 4 dedicated fully-fledged stereo returns plus 2 stereo effects returns
- Stereo solo-in-place (PFL) on every input channel
- Direct outputs on each mono channel for recording direct to multitracks
- Dedicated 2-track tape return routable to mix
- Global phantom powering, compact 8U rack-mount design



POWERSTATION

Powered Mixer

Studio quality mixing, with integrated power amp and effects provide an all-in-one solution for live performance

- 8 mono and 2 stereo input channels
- 18 inputs at midxdown, including tape and effects returns
- Bullet-proof UltraMic pre-amps with 60 dB gain range for stunning signal handling capability
- High-spec 265W +265W (RMS) power amp
- Built-in Lexicon effects mixer
- Consistent high performance controls, PFL solo on all channels
- 3-band EQ with sweep mid-frequency on mono channels
- 2 auxiliaries for effects and foldback
- 7-band precision dual graphic EQ
- High pass filter on mono inputs
- 40 Hz subsonic filter on outputs to protect speaker cabinets
- 48v phantom power
- Inserts on mono channels and main outputs
- Separate power amp input to amplify external sources
- Dedicated record outs and tape returns, dedicated mono output
- Rugged steel chassis, hinged cover for protection



PROTRACKER

In-Line Multitrack Recording Console

- In-line monitoring signal format - 2 discrete inputs per channel
- 8 channels with 60mm faders
- Expansion sockets for daisy-chaining ProTrackers
- High quality, high gain mic pre-amp (-129 dB), 5Hz-150kHz with switchable 48v phantom power on every input
- Switchable high pass filter on every channel
- Built-in limiter (300ms attack time/3 sec release) selectable on every channel. Overload and limiter indicators on each channel
- Insert and aux switchable between channel and monitor paths
- Aux globally switchable pre/post fader
- Monitor fader and pan control
- Balanced tape send/return, switchable between -4dB & -10dB
- Separate pre-fade insert and return sockets, eliminating the need for Y-cables
- Inputs switchable to mix to allow simultaneous front-of-house mixing and recording
- Mix routable to tape sends 7/8 for simultaneous 2-track recording on a single multi-track, without effecting multitrack feeds from channels 1 to 6
- Headphone monitoring of 2-track return, aux, 7/8 or mix
- Monitor outputs follow headphone output
- Mix output & 2-track return accept +4dB XLRs or -10 dB RCA phones



SAMSON MIXPAD 9

Ultra-Compact 9-Channel Audio Mixer

A remarkably compact 9 channel mixer, the MIXPAD 9 offers professional audio performance and a wide range of user-intensive features. It boasts low noise and distortion specifications, includes wide-range gain trim controls for both mic and line inputs and provides exceptionally low group delay over the full frequency bandwidth for a more transparent, open sound. It also has a very high slew rate—usually found only on larger, more expensive mixing consoles—allowing it to react very quickly to transients and maintain a crisp, articulate sound. It offers phantom power (48v) for use with condenser microphones and an in-line power supply eliminates magnetically-induced hum.

- 3 mic/line inputs and 3 stereo channels (total 9 inputs)
- 2 auxiliary sends for effects and two Stereo returns
- Independent 2-band shelved EQ, pan control for mono channels and balance control for stereo channels
- Adjustable mic input trims allow use with a wide variety of mics.
- Phantom powered XLR mic input connectors.
- Peak LEDs for left and right main outputs.
- Extremely durable, extruded aluminum chassis.



MACKIE MICRO SERIES 1202-VLZ

12-Channel Ultra-Compact Mic/Line Mixer

Usually the performance and durability of smaller mixers drops in direct proportion to their price. Fortunately, Mackie's fanatical approach to pro sound engineering has resulted in the Micro Series 1202-VLZ, an affordable small mixer with studio specifications and rugged construction. It delivers no-compromise, non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio stations, broadcast studios and editing suites—where nothing must ever go wrong.

- Working S/N ratio of 90dB, distortion below 0.025% across the entire audio spectrum and +28 dB balanced line drivers
- 4 mono channels with discrete, balanced balanced mic/line inputs and 4 stereo channels (12 inputs total)
- Line inputs and outputs work with any line level, from instrument level, to semi-pro -10dB, to professional +4dB.
- Switchable phantom-powered (48v) inputs for condenser mics
- Every input channel has a gain control, pan pot, low EQ at 80 Hz, high EQ at 12.5 kHz and two aux sends with 20dB gain
- Master section includes two stereo returns, headphone level control and metering
- Sealed rotary pots resist and other contaminants.



MACKIE MS1402-VLZ

14 x 2 Compact Mic/Line Mixer

Mackie's fanatical engineers have done it again. Balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room feature. Nice long 60mm faders, six studio-quality mic preamps and extra Alt 3-4 stereo bus—less than 1.3 square feet of space

- Studio grade mic preamps (chs 1-6) with high headroom, low noise and phantom power. Also incorporate low cut filters to cut mic handling thumps, pops and wind noise. Lets you safely use low shelving EQ on vocals
- Trim controls (ch 1-6) with ultra wide range (+10 to -40dB) handle everything from hot digital multitrack feeds to whispering lead singers and older, low output keyboards
- Pan control with constant loudness and high UR attenuation so you can pan hard left or right without bleed-through
- Two aux sends per channel with 15dB extra gain above Unity
- 60mm log-taper faders are accurate along their whole length of travel and employ a new long-wearing contact material for longer fader life & upper resistance to dust, smoke etc
- Control room/phone matrix adds incredible tape monitor, mixdown and live sound versatility
- Mute switch routes channel output to extra ALT 3-4 stereo bus. Use it for feeding multitrack recorder channels, creating a sub-group via control room/phones matrix, monitoring a signal before bringing it into the main mix or creating a "mix minus"
- Solid steel chassis instead of aluminum or plastic.



The new MS-1202, 1402 and 1604 all include VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for Mackie's acclaimed 8-Bus console series, VLZ effectively reduces thermal noise and minimizes crosstalk by raising current and decreasing resistance.

MACKIE CR-1604 VLZ

16-Channel Mic-Line Mixer

The hands-down choice for major touring groups, studio session players, as well as broadcast and sound contracting. The new CR-1604 VLZ features everything you would expect from a larger console, and then some! 24 usable line inputs with special headroom/ultra-low noise Unityplus circuitry, seven AUX sends, 3-bandEQ, constant power pan controls, 10-segment LED output metering and discrete front end phantom-powered mic inputs.

- Lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range). Many drummers consider it the only mixer capable of handling the attack and transients of acoustic and electronic drums
- Genuine studio-grade phantom powered, balanced input mic preamps on channels 1-6. All CR-1604 VLZ (and optional XLR10 for ten more) discrete input mic preamp stages incorporate four conjugate-pair, large-emitter geometry transistors. So whether recording nature sound effects or heavy metal, mixing flutes or kick drums, you get the quietest, cleanest results possible
- True 4-bus design with channel assign: to 1-2, 3-4 or main L-R
- 3-band EQ with mid-frequency sweep and low cut switch
- AFL/PFL solo and mute switches with overload and signal present indicators.
- Rear panel features include insert points and 1/4-inch XLR connectors on every channel, as well as R/A tape inputs/cuts.
- New standard size channel trim pots are found at the top of each channel
- Rotary input/output "pod" allowing three different positions for set-up



TASCAM M2600 mkII Series

16/24/32-Channel 8-Bus Mixers

LOW NOISE CIRCUITRY

- Combining completely redesigned low noise circuitry with Absolute Sound Transparency™ the M-2600 delivers high-quality, extremely clean sound. No matter how many times your signal goes through the M-2600, it won't be colored or altered. The signal remains as close to the original as possible. The only coloring you hear is what you add with creative EQ and your outboard signal processing gear
- Double reinforced grounding system eliminates any hum
- World-class power supply provides higher voltage output for better headroom and higher S/N ratio

PREMIUM QUALITY MIC PRE-AMPS

- The M-2600's mic preamps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel
- Accepts balanced or unbalanced 1/4" inputs, and low-impedance XLR jacks. Better still, the TRIM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the -20 dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug in anything—keyboards, guitars, basses, active or passive microphones, samplers and more.

THE BEST AUX SECTION IN THE BUSINESS

Versatile AUX section has 8 sends total, 2 in stereo. Send signal in stereo or mono pre- or post-later. Available all at once. Return signal through any of 6 stereo paths.

FLEXIBLE EQ SECTION

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. 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 buses, direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching.

ERGONOMIC DESIGN

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




BEHRINGER MDX 1200 Autocom



- Attack and release times, with Intelligent Program Detection, prevents common adjustment errors
- Newly-developed, powerfull noise gate
- Switchable soft knee/hard knee characteristics for varied sound pressure levels
- Bright, illuminated LEDs show gain reduction

BEHRINGER MDX 2100 Composer



- Integrated auto/manual compressor, expander & peak limiter
- Compresses "musically" in dynamic range without any audible "pumping" or "breathing"
- Attack & release times are controlled automatically or manually
- Interactive Gain Control (IGC) combines a clipper and peak limiter for distortion-free limitation on signal peaks
- Servo-balanced inputs and outputs are switchable between +4dB and -10dB.


STEWART PA-1000 PA-1400 PA-1800

Power Amplifiers



- High frequency switch mode power supply fully charges 120,000 times per second (1000 times faster than most 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-1400 or PA-1400's (4 PA-1800's) can be run on one standard 20amp circuit. No need for staggered turn-on configurations or other preventive measures when using multiple amp set-ups
- They produce smooth and uncolored sound, while offering very full detailed low end response and tons of horsepower
- Each amp carries a full 5 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.

BSW Performance Series Amplifiers



BSW Performance Series 1

300 Watt Power Amplifier

- Measuring only 3.5 inches high and weighing 26 pounds, the Series 1 delivers more than 1500 watts per channel
- Its welded steel chassis is unbelievably strong while a custom heat sink extension provides exceptional thermal capacity
- An internal fan provides quiet background noise levels for critical monitoring applications and when pushed hard the cooling system insures continuous cool operation even in the most demanding situations
- Active balanced inputs with both XLR and 1/4" phone jacks
- Supplied with quality 5-way bridging posts for highly reliable speaker connection
- Front panel handles are reversible for either rack mount installation or easy handling
- LEDs are provided for signal presence and clip indication, the detented gain controls have large knobs for easy front panel adjustments.

BSW Performance Series 2

600-Watt Power Amplifier

- Same as above except the Series 2 weighs 32 pounds and delivers more than 300 watts per channel.

BSW Performance Series 4

1200-Watt Power Amplifier

- Same as above except the Series 4 weighs 53 pounds and delivers more than 600 watts per channel
- Has a switch selectable clipping eliminator that prevents damage to the speakers.

EQUIPMENT LEASING AVAILABLE

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BUSINESS LEASING AVAILABLE

TASCAM

DA-P1 Portable DAT Recorder

- Rotary two head design and two direct drive motors for the best transport in its class.
- XLR-balanced mic line inputs (with phantom power) accept signal levels from -50dB to +4dB.
- Analog line inputs & outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enable direct digital transfers.
- Uses next generation A/D & D/A converters for amazing quality.
- Supports 32/44.1/48kHz sample rates & SCMS-free recording.
- MIC limiter and 20dB pad to achieve the best possible sound, without outside disturbances.
- TRS jack & level control to monitor sound with your headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter & 1 battery.



SONY

TCD-D8

DAT Walkman Player/Recorder

- Long Play (LP) mode allows 4 hours of record/playback of 12-bit audio on a single DAT cassette.
- Equipped with digital coaxial and optical input connector. Also has analog Mic and Line inputs.
- High-Speed Automatic Music Sensor search function finds & plays tracks, skips forward or back up to 99 tracks, all at 100X normal speed.
- Digital Volume Limiter System increases listening comfort & sound quality by automatically adjusting for sudden level changes.
- Two-speed cue-review lets you hear sound while player is in fast-wind modes, up to 3x or 25x normal speed.
- LCD display with backlit windows clearly shows recording level, track number, operating status and 4-segment battery indicator, even in low ambient light conditions.
- Optional RM-D3K System Adapter Kit for complete digital interface. It has input/output connectors for both line optical cable & the coaxial cable. Also includes a wireless remote control.



TCD-D10 PRO II

Portable DAT Recorder

- Has balanced XLR input, switchable mic (-60dB) & line (+4dB) inputs. A 12-pin digital connector provides interfacing with AES/EBU digital signals of 32/44.1/48 kHz sampling rates.
- Comprehensive self-diagnostics function constantly monitors the rotation of the head drum, capstan and reels. The tape transport mode and load/unload time are continuously checked as well.
- Up to 99 start IDs can be recorded in the subcode area. When the record button is pressed, the start ID is recorded automatically for 9 seconds. During recording, it can also be added manually to any position of the tape. Search for start IDs is 100X normal speed.
- 20-segment digital peak level meters include overload indicators. Glossy tracks input signal for accurate level indications.
- During playback, the date and time of recording is displayed.
- Has a record-level limiter with a fast attack time of 300ms. Mic attenuator prevents distortion by suppressing signal level 20 dB.
- Immediate playback is possible through a built-in speaker.
- Supplied wired remote controller also accepts a mic holder.
- Two mic stand screw adapters are also supplied.
- Supplied NP-22H rechargeable battery provides 1.5 hours of operation. Optional NPA-D10 battery adapter enables 1 hour on AA batt. Supplied ACP-88 AC adapter operates on 100-240V 50/60 Hz.



Roland DM-800

Digital Audio Workstation

A compact, stand-alone multi-track disk recorder that provides an amazing array of features at an unbelievably low price. Whether for music production, post production or broadcast, the DM-800 lets you work easier and faster. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing, to rotation track-bouncing, to final mixdown. It fully supports SMPTE and MIDI time codes and also features a built-in Sample Rate Resolver to synchronously lock to any time code.

HIGHEST QUALITY SOUND

- Sampling rates of 48/44.1/32 kHz • 24-bit internal processing
- 18-Bit A/D and D/A with 128 and 8 times oversampling

POWERFUL EDITING

- Time compression, pitch compression
- Non-destructive cutting, erasing, copying
- Fast looping for music or ambience editing
- S/L level: of waveform zoom
- Optional RS-422 interface

FULL AUTOMATION

- Micro-processor editing of automation data
- Dynamic and snapshot automation of level, pan, 2-band EQ, including frequency select, boost and cut
- Phase level editing of level, crossfade and fade in/out

TRIGGER FEATURES

- Trigger mode to play any combination of 8 tracks for vocal takes or sound effects placements
- Advanced trigger mode for live operation with preset or dial up cue of phrases to be played one after another

FLEXIBLE I/O STRUCTURE

- Full digital patch bay
- Stereo AUX send buss, 2 stereo AUX returns
- Digital stereo input and two digital stereo outputs • Direct channel cuts
- 4 balanced analog inputs with gain controls and 4 balanced analog outputs

MIDI FEATURES:

- MIDI machine control • Internal tempo master • MIDI clock and song position pointer output • 8 MIDI triggers for instant phrase playback • MIDI trigger of record and punch in/out • Tempo maps from external sequences, MIDI or tap input

RECORDING OPTIONS

- Records to standard SCSI hard drives
- Up to 24 hours recording time possible
- Uses MO, Syquest or Jazz drives for fast project change overs

PROJECT CATALOGING

- Up to 150 projects on line at once
- Cataloging of sound effects and projects
- Easy transfers of sounds from one project to another

VIDEO OUT

- Composite, S-video, digital RGB output
- All track overview with infinite level of project zoom
- Views of phrase and waveform editing
- Very accurate level meters
- Track status and time location

ACCURATE SYNCHRONIZATION

- Frame accurate sync to any time code
- Generates SMPTE time code
- 24.25, 24.97 (Wop/non-Wop) and 30 frames per second • Locks to MTC

Digital Multi-Track Recorders

TASCAM DA-88

The first thing you notice about the eight channel DA-88 is the size of the cassette - it's a small Hi-8 video cassette. You'll also notice the recording time - up to 120 minutes.

- These are just 2 of the advantages of the DA-88's innovative use of 8mm technology.
- ATF system ensures no tracking errors or loss of synchronization. All eight tracks of audio are perfectly synchronized. It also guarantees perfect tracking and synchronization between all audio tracks on all cassetted decks - whether you have one deck or sixteen up to 128 tracks!
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48kHz. The frequency response is flat from 20Hz to 20kHz while the dynamic range exceeds 92dB.
- Execute seamless Punch-ins and Punch-outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even edit individual tracks to generate special effects or compensate for poor timing.



SONY PCM-800



- Flawless sound quality, outstanding reliability and professional audio interfacing with AES/EBU digital I/O and XLR analog I/O connections.
- Combines audio functions such as precise auto punch-in/output digital cross fade technology, external synchronization with SMPTE/EBU time code and selectable sampling frequencies of 44.1 and 48kHz.
- Shuttle dial for precise tape control, variable speed playback of 6% to 0.1% increments and a flat frequency response from 20Hz to 20kHz.
- Operate up to 15 PCM-800's in perfect sync with optional RSC-S1 sync cables, for up to 128 channels of digital audio recording.
- Optional DABK-801 Sync/Record provides SMPTE/EBU time code generation and chase sync. It locks to the incoming time code with subframe accurate offset - ideal for audio-to-video applications. Also synchronizes to external video reference signal.
- Optional RM-D400 provides comprehensive remote control over all PCM-800 functions. The RM-D800 can control up to six units for up to 48 channels of digital audio.

ALESIS adat xt

8-Track Digital Audio Recorder

An incredibly affordable tool, the ADAT-XT sets the standard in modular digital multitrack recording. With new features & enhanced capabilities, the ADAT-XT operates up to four times faster than the original ADAT. Offers an intelligent software-controlled tape transport and provides on-board digital editing and flexible automation.

Stunning Audio:

- Incorporates ultra-high fidelity 18-bit, 128 X oversampling A/D converters which provide better-than-CD audio quality.
- For outputs, the D/A converters provide 24-bit, 8x oversampling performance for a flatter frequency spectrum, improved phase response and much less low-amplitude distortion.
- 20 Hz to 20kHz ±0.5dB frequency response, 92dB S/N ratio, crosstalk between channels better than -90dB @ 1kHz.

Onboard Autolocator with Auto Record:

- On-board 10-pin autolocate system provides quick access to multiple tape locations. Four special locate marks make your recording sessions quicker and easier.
- Auto play: the moment any autolocate point is reached, Auto Return automatically rewinds at the end of the loop.
- Auto Record function lets you automate punch-in/punch-out times that are accurate to 1/1000th of a second.
- Rehears Mode allows you to enter or exit record modes without actually laying tracks to tape.
- To record on the fly, you can enter the individual Record Enable buttons to punch in and out of tracks.
- Includes remote control with transport and locate functions, offers a tools/winch jack for hand-to-hand punch-in.

Intelligent Transport:

- Advanced transport software continuously monitors autolocate performance and the head constantly reads ADAT's built-in sample-accurate time code—even in fast wind modes.
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.

Flexible Inputs and Outputs:

- Servo-balanced 56-pin ELCO connector operates at +4dB to interface with consoles with +4 dB balanced inputs/outputs. Also unbalanced -10dB inputs/output (phono connectors).
- Has an electronic patch bay built-in so it can be used with stereo and 4-bus consoles.
- Multiple Optical Digital I/O carries up to eight tracks at once. The digital I/O combined with the ADAT Synchronization Interface make it completely compatible with any ADAT-format recorder or other devices that use Alesis' proprietary digital protocol.

Digital Editor:

- Make flawless copy/paste digital edits between machines or even within a single unit. Track Copy feature makes a digital clone of any track (or group of tracks) and copies it to any other track (or group) on the same recorder. The allows you to assemble composite tracks for digital editing.
- Use multiple ADAT-XTs and Tape Offsets lets you copy and paste not only track to track, but from location to location. Tape Offsets assembles your project with a minimum of repetitive overdunding and changes the tape position of a slave XT to its master, so you can "fly" audio to different locations on each tape.
- Track Delay can delay the time reference of a track by up to 170ms. Also easily change the groove of a tune. Track Delay is infinitely adjustable on each channel and is excellent for fixing slight timing errors in recorded tracks (player legs behind or rushes the beat). In recordings with multiple microphones, you can time-align each track, precisely compensating for the spacing between mics with accuracy to 0.0001 seconds.

Panasonic

SV-3800/SV-4100

Professional DAT Recorders



Designed for professional applications, the SV-3800/SV-4100 have highly accurate and reliable transport systems with search speeds up to 400X normal, and 20-bit D/A converters to satisfy the highest professional expectations both in terms of sound and functionality.

SV-3800 Features:

- Recording via analog inputs offers sampling rates of 44.1 or 48kHz. When recording through digital inputs, it automatically clocks to incoming frequencies of 32/44.1 or 48kHz.
- XLR-balanced digital inputs/outputs plus consumer format coaxial and optical inputs/outputs. XLR-balanced analog stereo inputs/outputs. Output level is selectable between +4dB and -10dB. The input level is -4dB.
- Built-in shuttle wheel has two variable speed ranges: 3 to 15x in Play mode and 1/2 to 3x normal speed in Pause mode.
- High speed transport enables searching up to 250x normal speed. Search up to 400x normal speed is possible once the tape has been scanned in Play, FF or REV mode. This ensures access to any point on a two-hour DAT in under 30 seconds.
- Ramped record mute and unmute with three seconds fade-in and five seconds fade-out provides automatic level changes at the start and end of a recording.
- Comprehensive display includes program numbers, absolute time, program time, remaining time and Table of Contents.

SV-4100 Has all the features of the SV-3800 Plus—

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

Fostex

D-5

Digital Master Recorder

With professional features and a consumer price tag, the D-5 satisfies a lot of requirements. It records or plays back four hours of music, includes optical and digital input/output, and TOC functions that are as easy to use as a CD player. It's also equipped with basic pro features such as ID editing function, GPI and XLR connectors and 300X speed locate and search functions.

- Playback/record audio with 32/44.1/48 kHz sampling in SP (standard play) mode. Equipped with LP (long play) mode. It can play/record at 32 kHz up to 4 hrs. on a 120 minute cassette.
- Analog interface includes switchable (+4dB/-10dB) balanced and unbalanced XLR inputs and outputs.
- AES/EBU digital interface (XLR) for professional use and optical (S/PDIF) input/output for consumer/semi-pro connections.
- 5-pin GPI input connector allows Play, Stop & S-ID search to be implemented through commands from an external source.
- Records CD-Q code sync ID, enabling precise music start up.
- When performing digital signal transfer from CD through it's optical input, the D5 precisely records S-ID's according to the track number and index information of the CD-Q code. So even if there is a break in the middle of a song or there isn't a non-recording section between two songs, you can locate to the S-ID location (eg beginning of song) precisely.

D-10

Digital Master Recorder



- Switchable 44.1 and 48kHz sampling frequencies
- Analog interface includes switchable XLR-balanced (+4dB) and unbalanced RCA (-10dB) inputs and outputs
- Equipped with and XLR-balanced AES/EBU digital interface and optical (S/PDIF) input/output conforming to IEC consumer as well
- Built-in 8MB RAM (4 MB x 2) offers instant start up as well as scrubbing at 1/4second accuracy
- Advanced jog/shuttle for precision cueing and monitoring
- Auto Cue provides automatic locating to the exact start of audio modulation during ID search and tape loading
- Universal GPI input/output enables easy and fast assemble editing, based on A-time between a pair of D-10's
- Switchable 2-position reference level: -12dB/-20dB
- Start and Skip IDs as well as up to 799 P-NOs can be recorded and played back
- 10-digit key-pad lets you store and recall 100 cue points
- Continuous or peak reading level meters can display available headroom with an accuracy of ±0.1dB
- Reads and displays A-time or P-R-time, also provides PCM monitoring
- Optional 8333 interface card adds timecode and RS-422 (X2) functionality to the D-10
- Reads an external timecode and records on the sub-code area
- Reproduces and outputs the timecode from sub code area
- Switchable RS-422 and EBus protocols. Using the EBus, up to 16 D-10s can be busy chained

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- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status ID number, tape source status and machine status.
- Supplied Nickel Metal Hydride rechargeable battery powers the PDR1000 for two hours. The battery has no "memory effect" and is charged in two hours with the supplied AC Adapter/charger.
- PDR1000TC Additional Features: In addition to all the features of the PDR1000 recorder, the PDR1000TC is equipped to record, generate and reference to time code in all existing international standards.
- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
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- Is the price too LOW? If a deal seems too good to be true, it probably is.
- Consider the quality of the company's clientele--does it work with professionals--names you recognize? Ask for references.
- Consider how knowledgeable & helpful the company's staff is on the phone: do they know the music business? Are they interested in your project's potential?

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3. Think Backwards--Plan Your Promotion First

What good is a CD release if nobody hears it? Make sure you get your music to radio. Try to get onto a **radio-oriented sampler CD program**, such as the OASISALTERNATIVE™, OASISACOUSTIC™, OASISROCK™, & OASISJAZZ™ sampler CDs, which go to every radio station in their genres.

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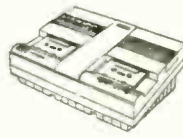
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ACROSS THE BOARD

continued from page 162

ed up cutting 18 tunes. Six that night, eight Wednesday, and four Thursday morning. Thursday afternoon I had two studios going at once. We needed to finish up some overdubs and fix some vocals, but if I didn't start mixing, we wouldn't make our deadline of mixed, mastered CDs in L.A. by Monday afternoon. So my assistant (Jason Lavine) worked on the overdubs while I started mixing.

I mixed Thursday, Friday, and Sunday. Don't ask me about Saturday — I can't remember Saturday. I finished mixing the last tune about 10 PM Sunday night, packed up my gear, went home, and started compiling and mastering mixes. I then had to cut six CDs for delivery to John, his manager, and the record company. I finished the last CD at 5 AM, packed my bag, and left at 6 AM to catch my flight to L.A. I dropped the CDs off on time Monday afternoon. We did it. With a lot of team work and little sleep, we pulled off what started out to be an impossible task. I attribute this successful project to all I

have learned by reading my columns in *EQ* magazine.

Attached To Plane Ticket: "NARAS Meeting Tuesday 11:30 AM." I am on the NARAS Technology Planning Committee with guys like Bruce Swedien, Lee Hershberg, Jac Holzman, Murray Allen, Les Paul, and John Eargle. The meeting is about identifying, acquiring, and preserving a definitive collection of recording equipment, technical instruments, and other relevant associated technology used throughout the history of the recording industry. This is going to be a fun project. I want to be the guy who goes up to George Massenburg's house, knocks on the door, and says, "Excuse me, George. NARAS Technology Police. I have a warrant to search your garage for technical artifacts for the NARAS Museum. I'll need to take a few of these GML mic preamps and a couple of these GML limiters if you don't mind. We need them for evidence."

On Bathroom Mirror: "Turn in *EQ* Column By Friday...Last Friday." Well, because of the time crunch, I didn't get into the bathroom much last week. This is Tuesday morning, I am on my way to the NARAS meeting, and I will let you know next month if I need any equipment out of your garage. **EQ**

ROOM WITH A VU

continued from page 29

cause we were physically and musically outgrowing everything. I bought more gear and I upgraded from a Mackie 24•8 to a 32•8 — we just needed more room. So I dismantled the whole studio. I rewired the patchbay and spaced everything around. I bought an Argosy desk for the Mackie; you need something to slump over after a 12-hour session and this is great for that! **EQUIPMENT NOTES:** Shelton continues: My secret weapons are the Mackie Ultramix and the ADL tube compressors. The Ultramix automation is just a dream come true, and Greg Mackie didn't leave anything out on the 32•8 board — it's the best deal on the planet for the money. The ADL compressors makes the mics more open and sweeter; almost any mic I use gets plugged into an ADL. The Cakewalk sequencing program is also something that I could not do without. It's got all the necessary features for sequencing and is easy to learn. And, of course, it's all nondestructive editing, which is very important. The JI.Cooper MSB REV2 MIDI patchbay lets me fly in any other MIDI gear that I may need for any particular session. **EQ**



COMING UP IN **EQ** NOVEMBER

EQ'S AES SPECTACULAR. It's finally here — the audio industry's show of shows! Get the inside scoop on many of the new products that will keep you drooling throughout the upcoming year. Plus, the tales of Los Angeles's recording history as told by Chris Stone.

EXCLUSIVE: DIGIDESIGN'S PRO TOOLS 4.0 IN REVIEW. Roger Nichols puts the latest version of the hard-disk recording standard to the test — and you'll read it here first.

ON THE ROAD AGAIN. In addition to the latest sound-reinforcement products from the floor of the AES Convention, *EQ LIVE* presents road stories from Mary Chapin Carpenter's and Dave Matthews current tours.

NEW COLUMNS. Two new columnists have joined Craig Anderton, Martin Polon, Eddie Ciletti, and Roger Nichols. They are legendary keyboardist Al Kooper, who gives his unique views of the audio industry, and musical Web expert Jon Luini, who reveals how to discover and use audio on the internet.

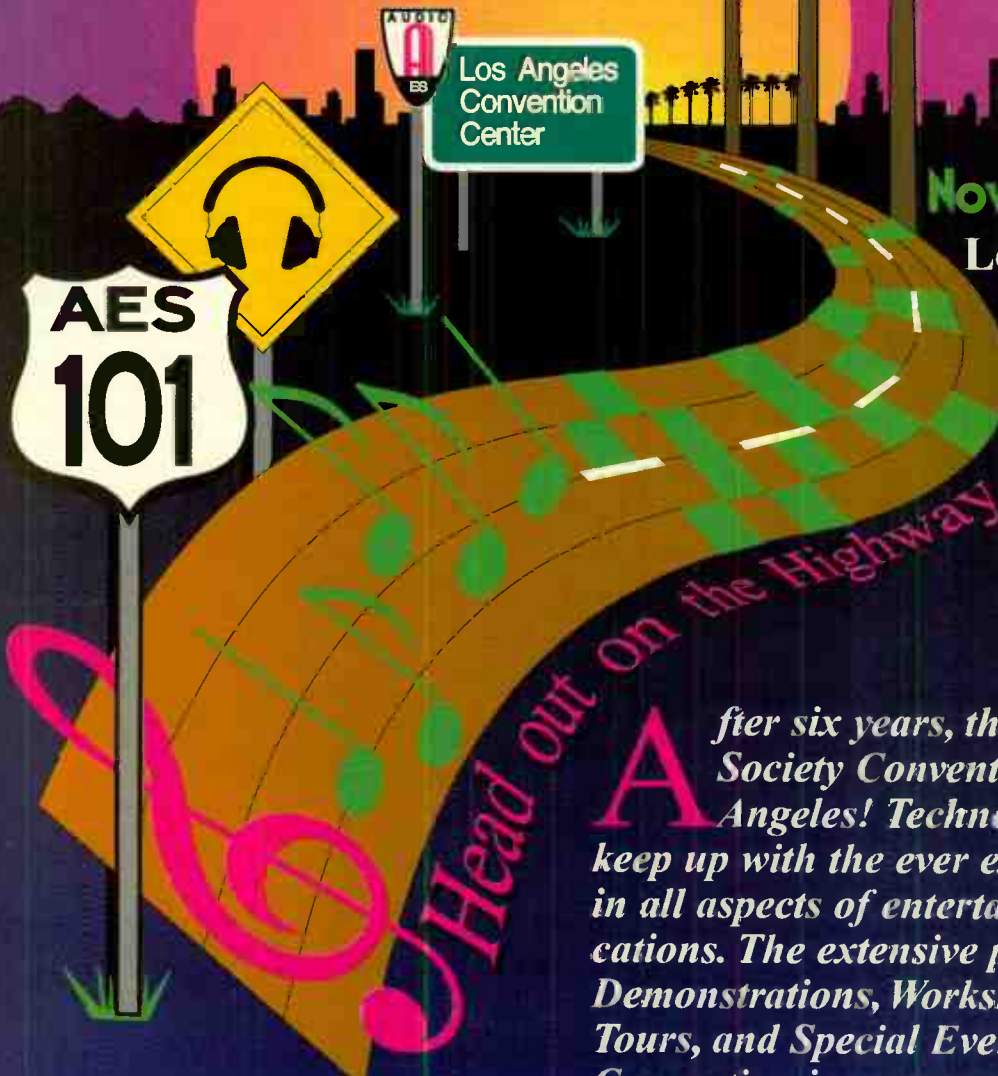
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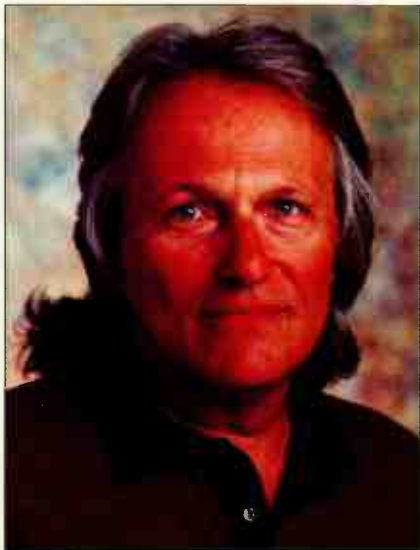
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Miscellaneous Notes

Straight from
my back pocket to the
back page of this
magazine

BY ROGER NICHOLS



On A Gum Wrapper: "Run For President." Campaign promises used to be: "A chicken in every pot and a car in every driveway." As the millennium approaches, we have attained that goal, sort of. There is a Kentucky Fried Chicken on every corner and there is a car in every driveway. The car might not be yours, though. It could be the police or the IRS. For this year, my slogan is going to be: "I promise 3 dB more headroom and a quieter noise floor for everyone." I think that just about sums up what we all need. Write me in and send me all of your campaign contributions.

While I'm at it, I think that everyone should own a computer. You guys are thinking, "I have a computer, so everyone else must have one too." Not quite, CPU breath. I talk to a lot of project studio owners who don't own any com-

puters at all. They insist on going in to the next century completely ignorant of web sites like hotsex.com and whatever else there is.

A Post-It-Note Stuck To Forehead: "Buy More Computers." Computers are getting so inexpensive that they are basically free. I just upgraded an old PC motherboard to something that would do a better job of running Windows for \$30. At Sam's Club I bought a 2.1 GB IDE hard disk for \$239. A hard-disk controller with built-in parallel port and two serial ports was \$49. I bought an 8x CD-ROM drive for \$123. Then I thought, "As long as I have all of this new stuff, I can't put it in the old case," so I picked up a case with a big power supply and tons of space for everything you could imagine for another \$45. And to top it all off, since I basically replaced everything on my old computer, I still have the untouched original (8 MHz 286 that cost \$4000 new). Maybe I should just get it a new motherboard.

The same thing happens in my studio. I keep replacing gear until eventually I have replaced everything in my original studio. This means that I have a complete working studio's worth of gear just sitting in a corner.

On The Refrigerator Door: "Return John Denver's Call." I engineered and produced John Denver records from 1980 until 1990. John then changed record companies a few times and they supplied the producers and engineers, so I was free at last. A couple of weeks ago he called me and said that he needed to cut four or five tunes and remix two previous recordings for an album to be released in Scandinavian countries. The problem was time. He had to start on Tuesday after Labor Day Weekend and be finished by Thursday night. I was supposed to be in Banff, Canada that Tuesday and wouldn't get home until midnight. John said he would send a Lear Jet to get me, but that it would cost \$10,000 that would eat into my piece of the budget. I said I would hitchhike if I had to, but I would get to Nashville by 3 PM so we could cut the tracks in the afternoon and evening. We agreed that it could be done, and the studios and musicians were booked.

The race was on. I had to rent a car

in Banff, get up at 3 AM, drive about 100 miles to Calgary, and change to an early flight back to Nashville. Since American Airlines dissolved its hub operation in Nashville, you can't get there from anywhere, so I had to fly to Dallas and change planes to get to Nashville.

As is usual when you are in a hurry, everything happens to slow you down. The flight from Calgary was late leaving because two trucks ran into each other right behind our plane and we couldn't push back out of the gate until they got all of the pieces cleared out of the way. Then, just as we were about to touch the runway in Dallas, all of a sudden the pilot switched on the power, raised the landing gear and executed a missed approach. The pilot got on the intercom and said that there was another plane still on our runway and there wasn't room for both of us. Good choice. It took 40 minutes for us to go around, get back in line, and finally get on the ground.

Instead of an hour between flights, I now had only eight minutes to get to the other side of the Dallas terminal complex (this should have been an Olympic event). The only reason I made it is because the door was stuck on the flight to Nashville and the maintenance crew was working on it when I got there. They closed the door and we were on our way. The winds were in our favor and we got to Nashville on time, taxied up to the gate, and just sat there. The newly repaired door would not open. It took over an hour for them to fix it so we could get off of the plane.

I got to the studio at 4:30. As I walked in the door, all of the musicians were in position eagerly awaiting my arrival. I had another engineer I work with go in and get everything set up, get cue mixes, and be ready to go when I got there. Sort of "tag-team engineering." I went into the studio and checked some mic positioning, then into the control room, where I scooted up to the SSL 4000G and, "Ah one, ah two, ah one, two, tres, quattro." We were waxing.

This is the good news. As it turned out, John was a little off on the amount of work that needed to be done. We end-

continued on page 160

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