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SOUND
MAGAZINE

1996 • ISSUE FOUR

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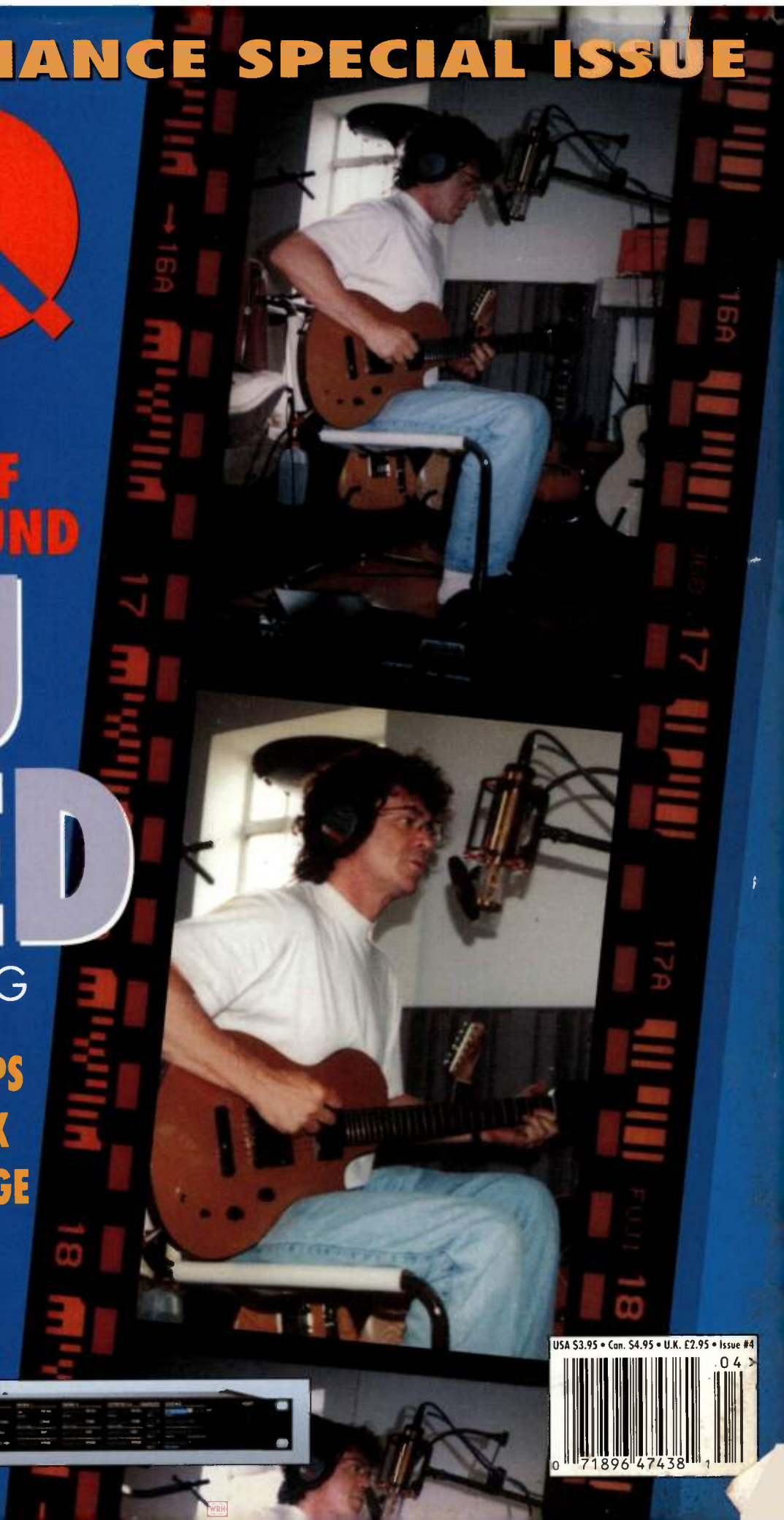
LOU REED

BY BOB LUDWIG

- USED CONSOLE TIPS
- MINI-DISC IS BACK
- MINISTRY ON STAGE

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EQ



PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 7, ISSUE 4
APRIL 1996



ON THE COVER:

Lou Reed studio photos by
Beth Groubert. Also shown:
TC Electronic M2000.

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For years, Lou Reed has strived to make his recordings sound just the way they do when he makes them in the studio, and, after numerous attempts, he's finally done it with his new release *Set the Twilight Reeling*. Bob Ludwig, who mastered the album, gets Lou to tell how he did it.
- COMING CLEAN ON MAINTENANCE** 80
Maintenance may not be fun, but it's definitely a part of both the studio and touring scenes. This special section offers tips and techniques on keeping your gear where it belongs — in your rack, and not on some repair shop's shelf. Maintenance topics include hard-disk, live sound, used gear and the TASCAM DA-88.

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Production Manager

Editorial Offices
939 Port Washington Blvd.
Port Washington, NY 11050
Tel: (516) 944-5940, Fax: (516) 767-1745

Administrative/Sales Offices
2 Park Avenue, Suite 1820
New York, NY 10016
Tel: (212) 213-3444, Fax: (212) 213-3484



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EQ EDITORIAL

Spring Cleaning



It doesn't matter whether your gear is spanking new or a collection of vintage oddities, everything eventually needs a little tweaking. The month of April is synonymous with Spring Cleaning, so this month's techno-oriented collection includes computer tips from Craig Anderton and me; live sound cues from James Pearson of Jason Sound; and a list of common MCI problems and their fixes from Glenn Coleman of Coleman Audio. I've got a few tips, plus an experimental accessory for the DA-88, in my column, which for this issue is located in the maintenance feature.

The first order of business in maintenance is to determine the level of maintenance with which you feel comfortable. Now before you throw this issue down thinking, "This is not for me," let me remind everyone that we all have achieved the status of "Systems Integrator." (Great title, eh?) Yes, even though audio is the common goal, our fingers are in the collective pie of technology. First there was analog, then MIDI, followed by digital, and, now, nonlinear recording, editing, and mixing. Pat yourself on the back for tackling any or all of the above.

It is necessary to attempt a deeper understanding of technology — if only to gain a bit of respect for those who affordably design and manufacture our *toyz*. For instance, I am totally impressed with the error correction on all of the digital audio tape machines. When the error correction does fail, however, you should not be surprised; there were clues along the way. I will continue to urge manufacturers to provide better access to all clues via both numeric error-rate indicators (ERI) and rear-panel "maintenance jacks" for the RF envelope and sync outputs, as well as increased stability via separate reel motors. Only one manufacturer provides an ERI on all of its machines (one level away via a front-panel "combination" keystroke). A full-time ERI is the best motivator for preventive medicine.

Of course, lots of new hardware and software get to market without being fully developed. We pay for that sort of maintenance in terms of frustration, time and cash. But it is also an opportunity for motivated users to document and deliver "bug reports" to manufacturers (and *EQ*). These users sometimes end up as beta sites — a form of product development that puts the future in your hands!

Does it get better at the top? I think not. No project studio can afford a full-time maintenance person unless that person is a partner. There is always the option of an extended warranty, which, like the maintenance contract, is offered at the time of purchase or to high-end users, respectively. I guess it's preferable to many that insurance come in the form of a suit and tie rather than sunglasses, a leather jacket, and a smoke. Then again, insurance comes in many forms, and knowledge is its number one form. So if you are using a computer-based sequencer, but don't yet have a modem, get one, get online and communicate with us ("us" being other users and the manufacturers). It's easier than waiting on hold.

Keep reading and asking questions.

Eddie Ciletti
EQ's Main Maintenance Man

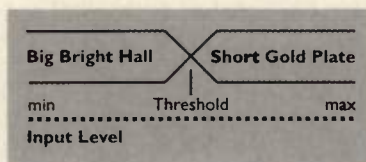


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JUST SAY NO

As an avid reader of *EQ* magazine for several years, I feel I must protest your use of pictures of "stars" with cigarettes. This just helps promote the "cool" image of smoking, and I think by now we are all aware that smoking is not healthy for either the smoker or anyone around them. Your publication is read each month by 6-8 people in our facility, and most of them are young and very impressionable. We've lost enough talented entertainers to smoking-related illnesses. I think it's time publishers started thinking and publishing responsibly.

Erick Baze
Production Supervisor
ViacomSF

OFF BROADWAY...

Having read the First Look of the new Soundcraft Broadway console in the December issue (and having actually seen the desk at the NY AES Convention), I am convinced that, once again, a major audio manufacturer has neglected the real-life needs of its end users. In this case, it is theater sound designers like me.

When one designs a theatrical production, a designer must make his or her design as simple as possible for the operator running the show each night. If the designer and operator both memorize the manual for this desk, there is no problem. However, if I configure this console for my show, and my operator is unable to mix on a given night, another engineer must be able to step in and mix this show on the fly. If they are spending 45 minutes trying to figure out the signal flow and where a simple reverb send is, they have no chance to run the show capably, automation or no. If there happens to be a producer or two in the audience that night, what do I tell them? There is no

excuse — and no guesses as to whether or not I'm hired back.

Maybe there will be a manufacturer who will actually talk to some real-world theater designers and engineers about solutions to some real-world needs.

Jeff Willens
via America Online

...OFF OFF BROADWAY

Many thanks for your letter regarding Soundcraft's Broadway console. I welcome the opportunity to respond to your various concerns about the design and practical operation of the console.

I understand your fear that this console might have been designed without the cooperation of theater sound designers and consideration of their needs. I would agree that, in our industry, electronic product designs are sometimes brilliant in principle, but implemented in such a way as to be practically unusable in the "real world." I can assure you, however, that Broadway has been designed from the outset with the aim of providing audio professionals such as yourself with a

tool that is both creative, powerful, and above all, simple to operate.

The simplicity of Broadway is derived in part from the familiar layout employed in the main operating areas of the console. Evidently, when designing a control surface/audio rack system, a manufacturer needs to combine the best elements of traditional console surface layout (which offer simplicity and immediacy) with those offered by the new freedom of layout and the potential of assignability. With the Broadway layout, we have remained very traditional in certain areas, and less so where a different layout allows easier access to the new functionality.

Contrary to your concern that "there are very few dedicated controls," the channel strip at the top of every input surface offers just that functionality — a complete channel path (just as on a conventional console) with dedicated controls for every parameter. The only assignability in this area is the "SWAP" button, which flips the Group/Aux send controls between sends 1-16 and 17-32. Since all sends from the channel are named via dot-matrix LED displays, it is very clear which sends are viewed at any given time. Even if the SWAP button is not used, the user still has access to 16 sends on dedicated controls.

Thanks to the channel strip, changing the function on a channel is as simple as selecting the channel and changing the desired parameter. Equating the process of selecting a channel (press SEL above the fader) with looking along a scribble strip on a conventional board before following the channel up to the required parameter, this process is no more complicated than a conventional console, and will take no longer.

On every input surface, there are 20 namable faders, and up to 8 banks of these 20 faders (i.e., 160 independently named channels) may be

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Routing is paramount to any recording console. The PS 2482 offers more flexibility with routing and features, available to each path, than its closest competitor. **3** EQ and AUX sends can be made a part of the MIX B path.

4 The PS 2482 is the industry leader when it comes to providing a flexible AUX/Matrix, which allows you to have what you want, where you want it.

5 With eight stereo AUX returns including EQ, four AUX sends, pan, solo, mute, full-bus routing, and 60 mm faders, the PS 2482 leaves other consoles "out-in-the-cold."

Other functional niceties that make this console a gem to use in the studio are **6** bi-colored LEDs on all signal paths, so you can see the signal status at a glance, in and out of the console. **7** All eight buses have a mute switch, a bus/L-R switch, and a pan for stereo placement in the mix path. **8** Peavey's exclusive Delta Vu™ metering gives you the most accurate measurement of levels to the stereo mix.

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LETTERS TO EQ

accessed via the 8 Bank switches in the center of the surface if the designer feels that this is appropriate.

I agree entirely with your comment that the sound designer must ensure that the system is operable by any operator at a moment's notice. This is certainly the case with Broadway. The design of the user interface is such that it will not be necessary for the designer and operator to "memorize the manual" (which would obviously be unacceptable), as you suggest might be the case. Indeed, thanks to the "user-friendly" software front-end, I would hope that we have largely eliminated the need for a manual, except as a point of detailed reference for particular queries. Those who need to operate a preprogrammed show should certainly have no problem operating the console to that level. Great care has been taken in ensuring that the primary mixing areas of the console — the fader tray and the channel strip — are very conventional in design, and instantly recognizable to any new operator.

To conclude, I thank you for taking the time to say what others in our industry are doubtless thinking — that there are various critical areas in which automation and assignability could prove a hindrance in live sound. I can assure you that every care has been taken in the design of both the hardware and software of Broadway to ensure that the power, control, flexibility, and repeatability of this console is not offered at the cost of simplicity and immediacy of operation. We have never forgotten that Broadway has to be operated in the high-pressure environment of live sound. We feel that the technology must remove from the user the mundane tasks of resetting and reprogramming from night to night, and offer the operator an ergonomic and responsive mixing environment in which to creatively mix the show. Which, after all, is what it's all about, isn't it?

David Harman
Broadway Product Manager
Soundcraft

TUBE TIPS

It is always a pleasure to read Eddie Ciletti's column. I own a number of vintage Fender tube amps, and so February's topic was of great interest. Mr. Ciletti was right on about the problems with tube amps, but I think he neglected to mention another very important

problem common to older amps: the coupling capacitors. I have owned my amps for a long time and they never sounded quite right. I changed tubes, speakers, guitars, and strings, but nothing made the difference I was looking for. I finally decided to grit my teeth and do what no guitarist wants to do: spend some money on amp service. For a nominal fee, the tech found two leaky coupling capacitors and adjusted the bias for the output tubes. It made the amps sound sweet and warm! My 1955 Fender deluxe sounds so good that I can't turn it off!!

I might also mention an old trick on guitar pots. If you bypass the volume pots with a 220k resistor and a 250 pF cap in parallel, soldered to the two tabs on the pots (not the tab to ground) it smoothes the taper of the pot and allows the high frequencies to pass. This trick maintains the brilliance of the pickups even when your volume pot is at low levels on the guitar.

*Jeff Landgraf
Buena Park, CA*

RIGHT 4-TRACK REVISITED

I read Kevin Paez' letter "On the Right 4-Track?" in the February '96 issue with considerable interest. Kevin appears to be looking for a synchronizable Portastudio-type product with balanced inputs and outputs.

The reason such a product is not readily available stems from the fact that the type of transport found in our Portastudios is significantly different from that of a synchronizable cassette transport. The cost of a synchronizable transport is roughly double that of the type found in a Portastudio. Furthermore, adding balanced inputs and outputs to this type of product again increases the cost.

Our market research has shown that the overwhelming majority of Portastudio product users are looking for a cost-effective, easy-to-use recording system that will capture their ideas and inspirations. The ability to synchronize multiple units is rarely an issue, as we offer both 4- and 8-track systems. With the typical user and the increased costs in mind, it

becomes very difficult to deliver the type of recorder that Kevin seeks. But this, of course, does not mean we can't deliver.

TASCAM builds recording products for all applications and all budgets. Perhaps Kevin should look at our 134B stand-alone 4-track cassette recorder. Used with the ATS-500 synchronizer, the 134B will make the ideal companion to the Mackie 1202 he describes in his letter. The 134B has balanced outputs. Should balanced inputs be required, the LA-40 MKII will resolve that issue for him.

*Roger M. Maycock
Marketing Support Representative
TASCAM*

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



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

6 **MAC® & WINDOWS® 95-BASED AUTOMATION THAT'S RELIABLE, PROVEN AND AFFORDABLE.**

Along with affordable digital multitrack recorders, the Mackie 8•Bus has made it possible to do world-class productions on a modest budget. But until now, Big Studios have still had one remaining and unattainable creative "secret weapon"... computerized level automation. That's why we developed the UltraMix™ Universal Automation System. It gives you fully editable and recallable control of input, channel and master levels — plus features not found on even the most expensive proprietary Mega-Console automation systems. Equally important, it doesn't degrade sound quality, introduce zipper noise or

cause audible "stepping." UltraMix is currently being used to mix network television music themes and on several major album projects — by seasoned engineers who grew up on Big Automation Systems. Their verdict is that UltraMix is a serious automation solution — stable, reliable and frankly easier to use than more expensive systems. The basic system controls 34 channels and can be expanded to as many as 128 channels. UltraMix Pro™ software, for 0301040 & Power PC Macintoshes and PCs (Windows® 95 required), includes a



wealth of features like editable fader curves, built-in level display, unlimited subgroups, SMPTE time code display, event editor with pop-up faders, optional control of outboard effects devices and the ability to play Standard MIDI files from within the program.

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

¹ Mention in this ad denotes usage only as reported to Mackie Designs, and in no way intended to constitute official endorsement by the artists or groups listed.

* As compiled by a leading Independent Console Video Feedback Evaluation Laboratory. Your count of superior Mackie 8•Bus console features may vary.

SONS TO BUY OUR 8-BUS CONSOLE. VIDEO CONTAINS AT LEAST 71.5* MORE.



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

FREE VIDEO! Choosing the right 8-bus console can be pretty confusing these days. That's why we've whopped up a free video that gives you some solid reasons to buy a Mackie 8•Bus. This eclectic compilation contains excerpts from our epic 8•Bus Video Owner's Manual, an introduction to UltraMix™ Automation System and an award-winning short subject, The 2nd Mackie Home Video. Watch all three parts before you part with bucks for any 8-bus console.

FREE VIDEO FINE PRINT. Visit your local Authorized Mackie Dealer for a real live 8•Bus demo, and then snag your free video. This handsome offer is good while supplies last, so you snooze, you loose. Limit: one per customer. If you just can't seem to make it to a dealer, it's available from Mackie by phone or fax request - no reader response cards. Allow six weeks for delivery. You will also receive our 48-page 8•Bus and UltraMix™ Universal Automation System color tabloid. This video offer is available to respondents in the U.S. only.

Canadian readers, call SF Marketing at the toll-free phone number below. In other countries, please consult your local Mackie Designs Authorized Distributor.

Above: 24•E 24-ch. expander with optional MB•E meter bridge and stand. Above left: 32•8 with optional MB•32 meter bridge and stand.

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

7

WIDE MID RANGE EQ.

Whether you're tracking or mixing, equalization is one of your most important creative tools. We concentrated on important things like giving you Classic English Console EQ capabilities. By that, we mean extremely-wide-bandwidth peaking equalization that can be used to achieve effects that simply aren't possible with narrower EQ. Most Brand X midrange EQs have a fixed bandwidth of about 2 octaves (blue graph above right). You can sweep it up & down the frequency spectrum, but the "sharpness" of the EQ curve is always the same.



left). That extra octave of "width" gives you a whole new creative palette.

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8

LEGENDARY RELIABILITY.

This is one of those factors you probably don't think much about - until your console goes down at in the middle of a critical session...at 2AM on a holiday weekend. Built with pride in Woodinville, WA, USA, 8•Bus consoles have an enviable 3-year track record for enduring continuous, round-the-clock use and abuse.

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CIRCLE 50 ON FREE INFO CARD



IN THE RED

Q I have a Sony DTC-A7 DAT machine and a TASCAM M-1516 mixer. I run from the mixer's stereo outputs into the analog inputs of the DAT deck, and from the DAT analog outputs to the external inputs on the mixer. I'm aware that TASCAM gear runs at -10, but the Sony DAT manual says the analog outputs are +4. (I didn't know RCA jacks could be +4.)

When I mixdown, the mixer's L & R meters are hitting 0 dB, but when it comes back to the mixer, via the external inputs, the monitor L & R meters are way up in the red, +5 and up. (Note: the monitor L & R meters are showing the output of the DAT.) So, can I assume that the DAT outputs are +4? Can I damage the mixer or DAT? If so, is there anything I can do?

Cory Gustavo
Navesink, NJ

A Since I have never been aware of RCA coaxial connectors ever carrying a signal level of +4 dBm, I began my quest for an answer by checking with Sony Pro Audio product manager Tim Derwallis. Tim confirmed my suspicion that the DTC-A7's output level is indeed -10 dBV from the RCA jacks. Apparently, even if the machine required calibration of its output levels, the likelihood of such an output discrepancy is negligible.

While it sounds like you are cabling your DAT to the M-1516 correctly, I can't help but wonder if there is something that's missing from this picture. I would urge you to double check your cabling arrangement to confirm that your wires are indeed connected in the manner you describe. If by chance you are using a patchbay for all your connections, inspect that cable setup as well. Patchbays are wonderful accessories when everything is wired correctly. They can, however, be a nightmare when they are wired incorrectly.

If, after a careful examination of your system's cabling arrangement,

this situation continues, I would recommend having both the DAT and mixer examined by a qualified service technician. You can certainly do damage to the mixer by operating at the signal levels you describe, and it's possible this may already have occurred.

Roger M. Maycock
Marketing Support Representative
TASCAM

GET A HEAD

Q In the May 1995 issue of EQ, page 84, the article states that the Fostex D-5 DAT recorder has only two primary transport motors; other sources indicate that this unit has four motors. Which is correct? If it does indeed have four motors, I would like to know whether these are all for the transport (cylinder, capstan, take-up, and supply) or for other functions. I am attempting to decide on a professional DAT recorder, so this information on the D-5 is important. (I'm also considering the Sony PCM-2600, or even the Pioneer 9601 Hi-Sampling DAT recorder.)

Ken/Eleven Shadows
(Hyperium Recording Artist)
via America Online

A The Fostex D-5 is a two-motor machine; that is to say, two primary motors do all of the work. Both the rotating head and the capstan are powered by direct drive motors. The reel tables are mechanically linked to the capstan motor. Secondary motors are used for loading the tape from the "elevator" and threading the tape around the head assembly. These should not be counted in the "primary group" as this leads to confusion.

Anyone purchasing an open-reel deck would choose separate reel motors because this type of design has a minimum of wear-related parts (belts, pulleys, rubber tires, felt clutches, and gears). Could you imagine a Fostex, Otari, Sony, Studer, or TASCAM open-reel machine without them?

The Fostex D-5 (a two-head machine) uses the same transport as the four-headed D-25, while the Fostex D-10 uses the Panasonic SV-3200/3700/3900/4100 series transport.

There are a wide range of options for DAT machine buyers. Two-motor decks generally sell for under \$1500,

while the jump to four motor usually ups the price to about \$2500.

Eddie Ciletti
Contributing Editor
EQ Magazine

THE FUTURE OF TDM

Q What does "TDM" stand for? Is it a protocol or a standard? Plus, what happens to TDM now that Macs don't have NuBus slots?

Nevis Phillips
Antigua, Guatemala

A TDM stands for "Time-Division Multiplexing." TDM is neither a protocol nor an absolute industry standard (such as an AES/EBU interface, etc.). It is a technology tool that was originally developed by the telecommunications industry and then adopted in many other areas. TDM allows many different signals to be sent along a common data highway, or bus, at a very fast rate. These signals are "time-sliced" into their own "time-slots," and travel together as a single data stream (that's the multiplexing part). When they get to their destination, the receiver can split out the signal(s) it needs.

Of course, Digidesign has a "standard" way to utilize TDM that allows the various Pro Tools III cards to share digital audio data for recording and processing. Our TDM implementation has allowed Pro Tools III to become a very successful platform for us and for our Development Partners. The Digidesign TDM bus that is supported on each card is not dependent on the bus standard of the computer, since the cards talk to each other directly over the TDM bus. The Digidesign TDM bus will continue to be used in our upcoming Pro Tools III PCI product line.

David Lebolt
Product Manager
Digidesign

Send your queries to:
EQ Editorial Offices,
939 Port Washington Blvd.,
Port Washington, NY 11050
Fax: 516-767-1745
E-mail: EQMagazine@AOL.COM

GET 20/20 VISION

Visualize this. A crisp 13" brass snare right between your eyes. Toms and cymbals precisely placed across the stereo field. The bass guitar deep and clear, sitting just above the kick drum. Layers of newly strung guitars far to the left and right.

Keyboards hovering in the air. Voices floating free. Everything detailed. Everything in its own space.

Introducing a monitoring system so good that you can close your eyes and *still* visualize every instrument . . .
... the 20/20 *bas* from Event Electronics.



20/20 *bas* BIAMPLIFIED MONITOR SYSTEM

- Internally BiAmplified with 200W Total Power
- An Active Asymmetrical Fourth Order Crossover that separates the line level frequencies prior to amplification
- A 130 Watt Amp that receives only the low frequencies and is designed to perfectly match the 8" Mineral Filled Polypropylene Low Frequency Driver
- A 70 Watt Amp that receives only the high frequencies and is designed to perfectly match the 1" Natural Silk Dome Tweeter
- A Large Diameter Low Air Restriction Front Mounted Bass Port for full, accurate bass response
- An intelligent combination XLR or 1/4" Input Connector
- Continuously Variable Precision Low and High Frequency Trim Controls
- Input Sensitivity Control and Clip LED Indicator
- Circuit Breaker (no looking for fuses in the middle of the night)

It's easy to put the puzzle together when you can clearly see each piece. Seek out your nearest **Event Electronics** dealer and start your next mix with perfect sonic vision.

\$1000
*per pair**

* Unpowered 20/20's available for under \$400 per pair.



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CIRCLE 35 ON FREE INFO CARD



Introducing the coolest upgrade path in all of digital audio.

Here's news for every musician, editor, producer, and engineer: The industry standard digital audio workstation—Pro Tools from Digidesign—now comes in a range of products tailored to your needs and budget. Now you can start with the all-new Pro Tools with DAE PowerMix™ for just \$795. As your needs grow, you can climb all the way to the world's best-selling

Pro Tools Project™

Pro Tools with AudioMedia II™

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New. An amazing value that turns your Power Macintosh or Mac-OS clone into a multitrack digital workstation with no additional hardware. Pro Tools interface. Random access, non-destructive editing. Up to 16 tracks of play-

This audio card adds 2 channels of high-quality analog and digital I/O, and comes with industry standard Sound Designer II software and entree to its family of DSP Plug-Ins.

New. Pro Tools software and Pro Tools Project Audio Card. Adds 8 tracks of simultaneous record/playback. Up to 8 channels of analog and digital I/O. Supports Sound Designer II and DSP Plug-Ins.

workstation, ProTools III, with mountains of record tracks, I/O, and real-time effects and mixing. Each step of the way, you'll learn and grow with Pro Tools software, share work between

systems, and take an upgrade path that lets you build on the value of your investment. Audio professionals now have more choices and flexibility than ever before. And getting started couldn't be easier. To learn more about the clearest path to the best in digital audio, call 1-800-333-2137x247.

Pro Tools III™



The ultimate workstation. TDM virtual digital mixing and processing environment accommodates a wide variety of real-time Plug-Ins. 16-48 tracks of record/playback. 8-64 channels of high-quality analog and digital I/O. New for '96: ProControl,™ an advanced tactile control surface with dedicated controls for mixing and editing, plus high-quality moving faders.

For audio professionals and musicians, as well as for more than 100 Digidesign Development Partners, Pro Tools is the industry standard. That's why more audio professionals use Pro Tools than all other

digidesign

Avid Audio Division



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EQ PRODUCT VIEWS

HEADPHONE HEAVEN

Furman's HA-6A has six stereo headphone jacks each with an independent volume control and connects

to any stereo or mono mixer line out for headphone monitoring applications. The 1U HA-6A has a built-in power amp that delivers 20 watts per channel, which allows it to power six stereo headphones or two pairs of nearfields. The HA-6A features a new toroidal transformer for quiet operation and low magnetic leakage. Suggested retail prices for the HA-6A are \$419 (unbalanced) and \$453 (balanced). For more details, contact Furman Sound, Inc., 30 Rich Street, Greenbrae, CA 94904. Tel: 415-927-1225. Circle EQ free lit. #101.



NANO, NANO

The NanoVerb from Alesis offers 16 new effects algorithms, including hall, room, plate, and nonlinear reverb; true stereo chorus and flange;

delay; and three multieffects programs with chorus/room, chorus/delay/room, and Leslie/room. The unit features 18-bit A/D and D/A converters with a 20-bit internal processor that operates at three million instructions per second. Front-panel controls include input level, effects mix, output level, program select, and a program adjust control. The program adjust control allows you to adjust a specified parameter for each program. The 1/3-rack-space unit has a suggested retail price of \$179. For more information, contact Alesis Corporation, 3630 Holdrege Avenue, Los Angeles, CA 90016. Tel: 310-558-4530. Circle EQ free lit. #102.



I'D LIKE A SAMPLE

Designed for use in the studio or stage, the Yamaha SU10 Digital Sampling Unit offers phrase sampling with record and replay capabilities of up to 48 stereo waveforms. Samples are stored even when the unit is turned off. The portable unit also combines true stereo digital phrase sampling with a touch-driven ribbon controller and real-time Scratch and Filter effects. The SU10 has four "songs" or sample-replay sequences that can be started, stopped or resumed at any arbitrary location within the song. Other features include the ability to hold selected samples and the ability to play any sample at 12 different pitches in Sample mode. For more details, contact Yamaha Corporation of America, P.O. Box 6600, Buena Park, CA 90622-6600. Tel: 714-522-9011. Circle EQ free lit. #103.



BE YOUR OWN BOSS

Roland's new BOSS SX-700 Studio Effects Processor offers multiple effects capability. The single-space unit offers 27 different

effects (up to five effects simultaneously) including standard modulation effects (chorus, flanging, etc.), three-dimensional panning featuring Roland's proprietary RSS technology, and a four-voice intelligent pitch shifter. Other features include parametric EQ, ducking delay, tap tempo delay, and a number of reverbs. The SX-700 operates in true stereo with 18-bit A/D/A conversion, and a 44.1 kHz sampling rate. For further information, contact Roland Corporation, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: 213-685-5141. Circle EQ free lit. #104.





TOTALLY TUBULAR

The DB 680 Bass Preamp from Aguilar Amplification has eight tube stages and features dual parametric EQs. Additionally, there are tube-driven shelving filters at 40 Hz and 4 kHz. The DB 680 has a "deep" control that employs a proprietary tube-driven resonance cir-

cuit, which provides two levels of boost in the 30 Hz region, while a "bright" switch boosts 5 kHz to 7.5 kHz. Output interfaces include a five-position balanced XLR (-20 dBm to +4 dBm for direct to tape recording), high and low 1/4-inch jacks, and unbalanced mono outputs. The DB 680 also boasts two switchable inputs, active/passive mode, tuner output and a tube-driven stereo effects loop. For more information, contact Aguilar Amplification LLC, 1600 Broadway, Suite 1004T, New York, NY 10019. Tel: 212-757-2823. Web Site: <http://www.aguilaramp.com>. Circle EQ free lit. #105.



BACK TO THE FUTURE

Following in the tradition of the tube mics of the '50s, the Soundelux U95 mic features a one-inch diameter capsule and vacuum tube electronics. The U95 offers switchable omni, cardioid and figure eight polar patterns with six intermediate steps. Pattern selection is accomplished remotely from the power supply unit. High-wattage metal film resistors are used for plate and cathode loads to reduce the introduction of thermal noise. Featuring a full-bandwidth frequency response of 20 Hz to 20 kHz, the Soundelux U95 has a sensitivity of 17 mV/Pa and a low equivalent noise of 18 dB(A). The microphone can accept a maximum SPL of 135 dB (0.5% THD) and boasts a dynamic range greater than 117 dB. Operating at an impedance of 150 ohms, the power supply is switchable between 115 and 220 volts. For more details, contact Group One Ltd., 80 Sea Lane, Farmingdale, NY 11735. Tel: 516-249-1399. Circle EQ free lit. #106.

EFX FILES

The EFX-3000 from Viscount Professional is a 2U, 24-bit digital signal processor that is specifically designed for the guitarist. The unit features four banks of 128 fully-programmable memories (for a total of 512 internal programs), as well as a large 240x64 pixel rear-lit graphic display screen. Users can combine up to nine effects, including compressor, distortion, equalizer, amplifier simulation, modulation, delay, reverb, and more. The EFX-3000 also features: a complete guitar tuner, a complete built-in spectrum analyzer, and an overall mic control. And 24-bit A/D and D/A converters are standard fare. For more details, contact Viscount Professional, 2350 Franklin Road, Suite 115, Bloomfield Hills, MI 48302. Tel: 800-253-0293. Circle EQ free lit. #107.



MIC OF ALL TRADES

Audio-Technica's MB4000C microphone features integral shock mounting as well as a multi-stage internal breath shield to reduce popping. The mic can operate on either battery or phantom power. Ideal applications for the



MB4000C include both solo and group vocals, piano, guitar, stringed instruments and drum overheads. The suggested professional net price of the MB4000C is \$125. For further information, contact Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, OH 44224. Tel: 216-686-2600. Circle EQ free lit. #108.

EQ PRODUCT VIEWS



SAFE AND SOUND

Featuring rack-mount and stand-alone versions, with 6 or 12 outlets and rated at 7.5, 15, 20, and 30 Amps, New Frontier Electronics' Surge-X™ series of mode surge protection devices offer high efficiency surge protection. Surge-X power filters will capture power surges and slowly release them onto the neutral line, stopping surges instantly before they reach sensitive equipment. All Surge-X components won't degrade and are warrantied by New Frontier for 10 years. For more details, contact New Frontier Electronics, 2744 N. Sugaan Rd., New Hope, PA 18938. Tel: 215-862-9344. Circle EQ free lit. #109.

VOICE OF THE PEOPLE

The MR-Rack from Ensoniq is a new 64-voice, expandable rack-mount synthesizer. The MR-Rack is the first instrument from Ensoniq to use their newly-developed voice architecture and new custom DSP chip (ESP-2). The unit offers a 44.1 kHz sample playback rate, four 18-bit DACs, and a hardware design that delivers a 103 dB signal-to-noise ratio. The MR-Rack also features a 12 MB waveform ROM, which includes newly-sampled piano, strings, bass, drums, and voices as well as pop, orchestral, drum, percussion and synthetic wave data. Wave ROM can be expanded in the MR-Rack up to 84 MB,



with the inclusion of three wave expansion board slots. Boards are user-installable, and each board can hold up to 24 MB of additional wave ROM data, as well as new Sounds and demos. For more information, contact Ensoniq Corporation, P.O. Box 3035, 155 Great Valley Parkway, Malvern PA 19355-0735. Tel: 800-553-5151. Circle EQ free lit. #110.

MINI ON THE MOVE

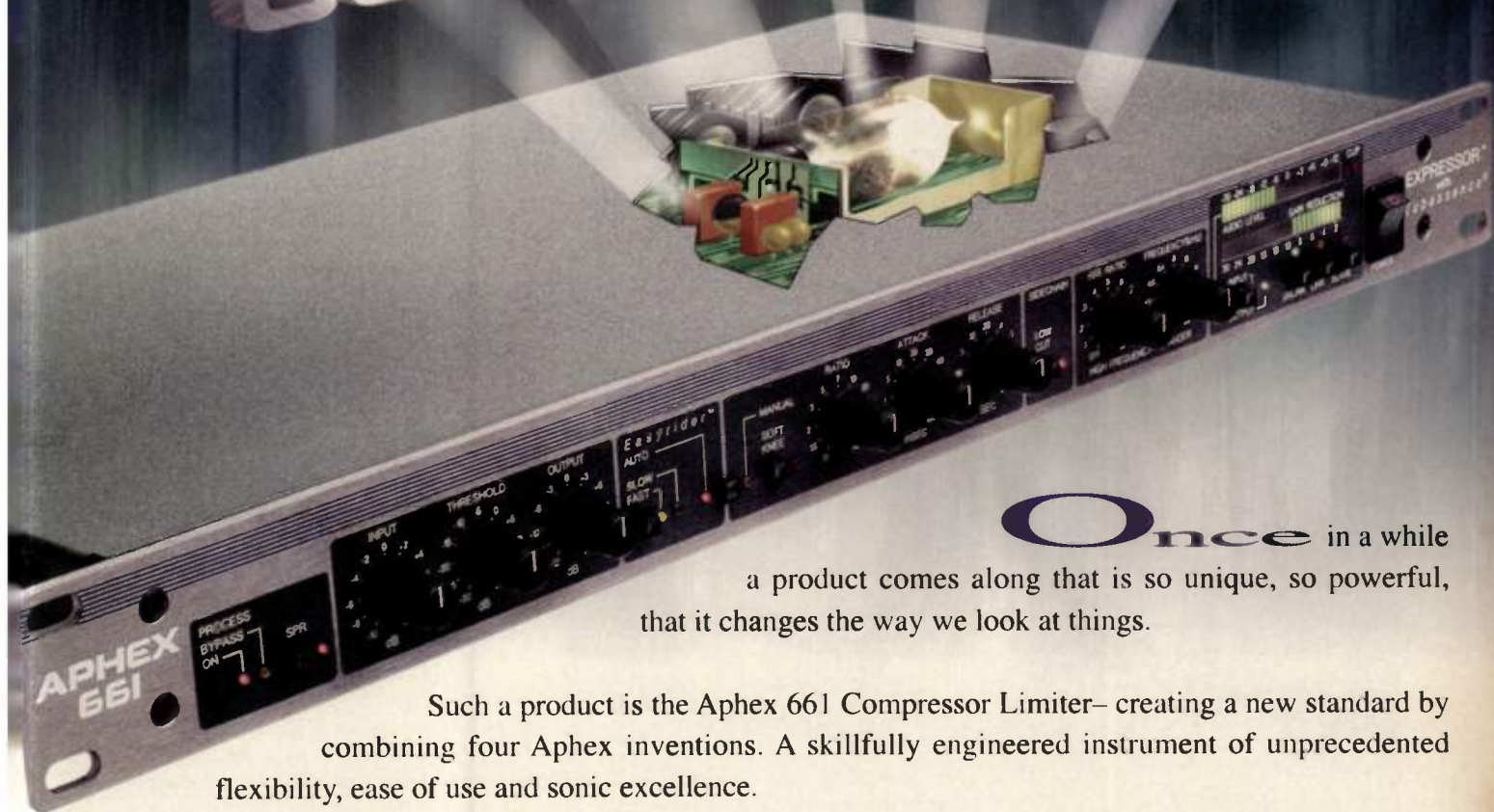
TASCAM's new MiniDisc recorder/reproducer/editors fully conform to the MiniDisc (MD) audio format, and provide random access capability. There are two available models: the MD-801R is the record/play version, while the MD-801P is the playback-only model. Features include instantaneous locate capability, repeat playback, move, insert, combine, divide, title and more. For interfacing with other components, the MD-801R includes both XLR-balanced and RCA-unbalanced analog inputs and outputs. Digital I/O support is provided in both AES/EBU and S/PDIF configurations. For connecting with computers and other external controllers, the unit provides both an RS-232C serial interface and a parallel interface. For further information, contact TASCAM, 7733 Telegraph Road, Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #111.

HIGH IQ

Ultimate Support Systems, Inc.'s new keyboard stand series, the IQ1000 and IQ2000 Single and Double-Brace X-Stands feature a new "memory lock." Once the pin is set at an ideal height, it opens each time to that position; there are four different heights available from sitting to standing. The legs are offset to create more leg room and room for pedals. The IQ series X-Stands also have adjustable cam-style end caps that adjust for stability on uneven surfaces. The stands are made in the U.S.A. and carry a three-year warranty. Suggested retail for the IQ1000 Single-Brace stand is \$50 and the IQ2000 Double Brace is \$70. For more information, contact Ultimate Support Systems, Inc., P.O. Box 470, Fort Collins, CO 80522-4700. Tel: 303-493-4488. Circle EQ free lit. #112.



APHEX TUBE COMPRESSOR



Once in a while
a product comes along that is so unique, so powerful,
that it changes the way we look at things.

Such a product is the Aphex 661 Compressor Limiter—creating a new standard by combining four Aphex inventions. A skillfully engineered instrument of unprecedented flexibility, ease of use and sonic excellence.

Tubessence® - true vacuum tube technology and warmth; High Frequency Expander (HFX)™ for automatically retaining the high frequencies lost during compression; Easyrider® circuitry for an Auto mode that really works; and the world's best VCA - the Aphex 1001, the fastest, most accurate and transparent available.

The Aphex Model 661 - another revolutionary step toward improving the way the world sounds.

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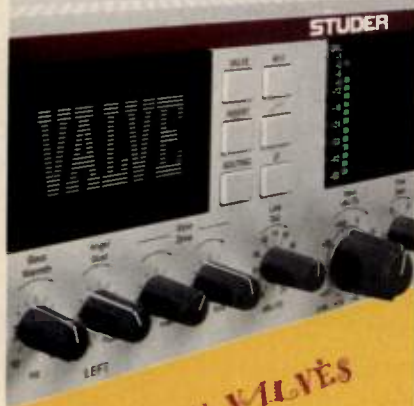
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STUDER D19 Series Mic VALVE

Valve Dignified Digital Mic Preamp

- Excellent MIC and LINE Preamps • High performance modular 20-bit A/D converters • Switchable Valve Dignifier stage • 3 adjustable valve sound parameters: Bass Warmth, Angel Zoom & Valve Drive • Highest Audio Quality & Individual Valve Sound Tuning • DSP Dithering and Noise Shaping for best quality on 16-bit media • Analogue and AES/EBU outputs • balanced pre/post valve inserts
- Optional ADAT™ or TDIF™ 8-CH outputs with output routing



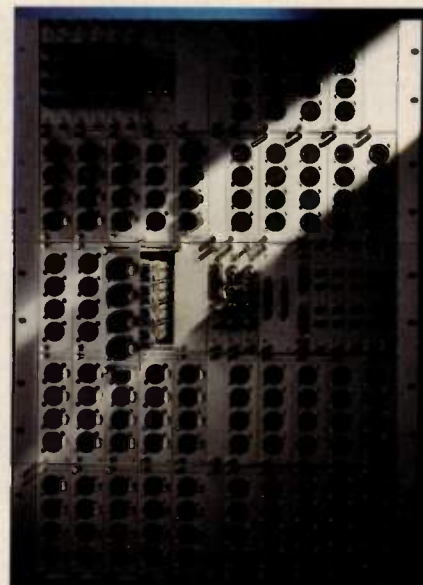
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STUDER
 PROFESSIONAL AUDIO EQUIPMENT

H A Harman International Company

CIRCLE 74 ON FREE INFO CARD

EQ PRODUCT VIEWS



GET CONNECTED

QSC's DARIS Digital Audio Routing and Interconnect System allows the long-distance transmission of digital audio signals over fiber optic links between base units. Each link is able to convey up to 64 channels. The base units can also perform matrix switching of up to 256 audio signals. Various signal processing boards can be fitted in the base units to perform digital signal processing. The entire system is controlled by one or more personal computers through an easy-to-use graphical interface. An operator using a controller PC can store and recall all parameters and configurations within seconds. Other features include 24-bit audio data transmission, 20-bit converters on inputs and outputs, and 40-bit floating-point audio signal processing. Supported audio formats include analog, AES/EBU, Yamaha, SPDIF and others. Supported sample rates include 32 kHz, 44.1 kHz, and 48 kHz internally, and 44.056 kHz by external synchronization. For more details, contact QSC Audio, 1675 MacArthur Boulevard, Costa Mesa, CA 92626. Tel: 714-754-6175. Circle EQ free lit. #113.



WRITE ME!

Superscope Technologies' Marantz Professional write-once CDR-620 Compact Disc Recorder incorporates 1-bit A/D and D/A converters, a sample rate converter, digital delay and automatic track incrementing and indexing from CD, DAT, DCC, and MD. The CDR620 can be used as a stand-alone

recorder or integrated into a studio's Digital Audio Workstation system through use of the built in SCSI-II interface. The cascade features provide simultaneous parallel operation of multiple machines, and a 9-pin parallel (GPI) interface facilitates external automation. For more information, contact Superscope Technologies, Inc., P.O. Box 2066, 1000 Corporate Blvd., Ste D, Aurora, IL 60504. Tel: 708-820-4800. Circle EQ free lit. #114.

GIMME SOME SPACE

Based on the multi-channel PRO Spatializer 3-D Audio Production system, the Spatializer Retro provides real-time 3-D audio processing for the project studio environment. Spatializer Retro turns your console's existing 90° pan pots into 270° 3-D positioning controls, allowing the user to create a mix that expands beyond the boundaries of any two speakers. Every pan pot will locate any mono source in 3-D reality, and by using two pan pots, the user can control the size of any stereo image. For more information, contact Spatializer Audio Laboratories, Inc., 207000 Ventura Blvd., Suite 134, Woodland Hills, CA 91364-2357. Tel: 818-227-3370. Circle EQ free lit. #115.

100 W RMS @ 0.01% THD per channel •

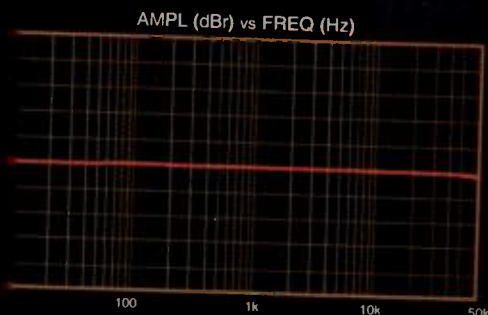
- ± 0.3 dB DC - 50 kHz •
- Convection cooled •
- Gold connections •
- Excellent signal-to-noise ratio •



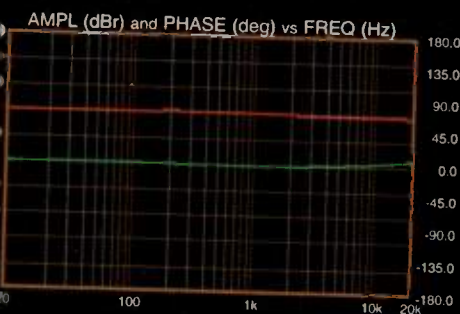
An all discrete MOSFET design provides a ruler-flat frequency response from sub-sonic to 50 kHz which is enhanced by the gold input and output connections.

RPTM 500

The RPTM 500 MOSFET studio reference power amplifier gives you the purest audio signal that money can buy. Throughout its development process, close attention was paid to every detail to ensure superior sonic performance. The RP 500 is accurate, translating into a perfect mix!



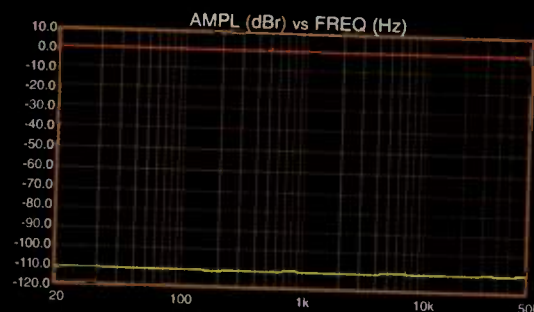
Frequency response, phase and signal-to-noise are technical terms that may make your brain hurt to think about, but they mean everything to the accuracy of your mix. Many amplifier companies strive for excellence in one area, being excellent in all of these is what makes the RP 500 the perfect studio amplifier.



Frequency Response

Phase

Noise Floor



PURE IMAGE The RP 500 has an exceptionally smooth phase response which enhances the stereo image. Phase shift can cause phase cancellations in the mix position, which leads to a "smeared" or reduced stereo image found in other amplifiers.



It is important for a studio amplifier to be quiet. **IT'S SILENT!**

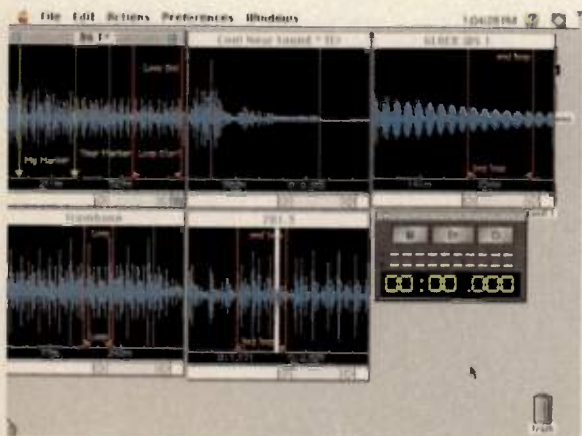
Traditional amplifiers produce electronic noise from op-amps and mechanical fan noise, which is unacceptable in the studio. The RP 500 uses convection cooling for quiet installation, and an all discrete transistor design provides signal-to-noise of -110 dB (UNWEIGHTED). Therefore, you hear the mix and not the amp.

EQ STUDIO WARE



A WING AND A PRAYER

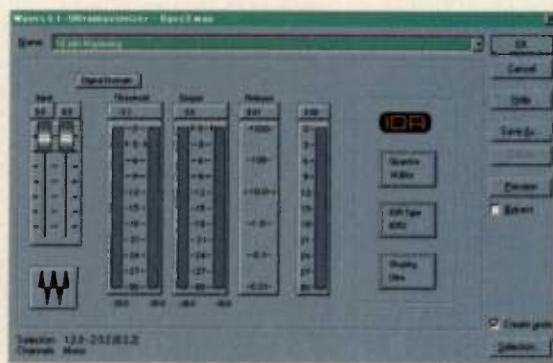
Digital Wings for Audio from Metalithic Systems is a complete (hardware and software), 32-bit, Windows 95-based hard disk recording/digital audio sequencing system for the PC. Features include 128 virtual tracks, nondestructive, real-time editing with multiple levels of undo, 32-bit operation and a full-featured waveform editing subsection. It also boasts real-time effects that include pan level, fade, waveform enveloping, delay, chorus, reverb, and stereo imaging. For more info, contact Metalithic Systems, Inc., 3 Harbor Drive, Suite 206, Sausalito, CA 94965-1454. Tel: 800-937-6744. Circle EQ free lit. #118.



session tools such as a time calculator, stopwatches, metronome, alarm, and a "virtual mixer" to record console settings. For more details, contact AutoMaxX, P.O. Box 80003, Appleby Postal Outlet, Burlington, Ontario, L7L 6B1, Canada. Tel: 905-639-9029. Circle EQ free lit. #116.

YOU GOT THE RIGHT 1

Sonic Foundry, Inc. and Waves Ltd.'s L1-Ultra-maximizer Plug-In is designed for any application where maximum level, quality, and peak control is required. The audio tool box combines an advanced peak limiter, a level maximizer, a re-quantizer, and a brick wall limiter with full implementation of Increased Digital Resolution (IDR) dithering technology all in one package. For more details, contact Sonic Foundry, Inc., 100 S. Baldwin Suite 204, Madison, WI 53703. Tel: 608-256-3133. Circle EQ free lit. #117.



DIGITAL APPENDAGES

In a continued effort to expand Cakewalk Pro Audio's support for PC-based hard disk recording systems, Cakewalk Music Software will begin shipping "audio drivers" for several digital audio hardware products. Among the products Cakewalk will release these drivers for include: Digidesign's new Audio Media III card, Soundscape Technology's SSHDR1, the Yamaha CBX-D3 and CBX-D5, the Roland VS-880 digital audio recorder, and Digital Audio Labs' new V8 card. For further information, contact Cakewalk Music Software, 44 Pleasant Street, P.O. Box 760, Watertown, MA 02272. Tel: 617-926-2480. Circle EQ free lit. #119.

PEAK PERFORMANCE

Ppeak is an audio editor/processor program for the Power PC, as well as most other Macintosh and PowerBook computers, from Berkley Integrated Audio Software (BIAS). The program offers nondestructive digital audio editing and processing, sound design and compositional tools, and full support for MIDI sampler instruments. Peak offers a number of undo/redo commands, unlimited zoom levels (with zoom memory), and background waveform redraws. Besides Mac standard AIFF and SDII file formats, Peak supports QuickTime and Red Book formats, and both 16- and 8-bit audio (.WAV will be supported in version 1.1 of Peak). For more information, contact Berkley Integrated Audio Software, 202 Donahue Street, Sausalito, CA 94965. Tel: 415-331-2446. Circle EQ free lit. #120.

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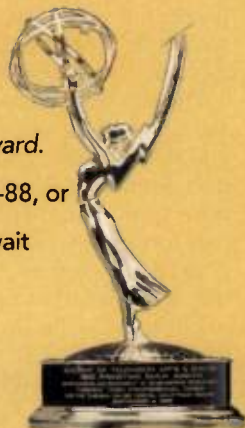
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Back From The Dead...

Just when you thought
it was safe...the
MiniDisc resurfaces for
project studio storage

BY ROBERT GRANGER

Of course, TASCAM isn't the only manufacturer of personal multitrack recorders, but when it makes a technology statement in its Portastudio line, the entire industry listens.

TASCAM made just such a statement at winter NAMM with the introduction of its 564 MiniDisc-based Digital Studio. MiniDisc? That's right. The magneto-optical format that fell flat on its face as a consumer replacement for the analog cassette is about to make a resurgence as a studio storage medium. And format supporters like TASCAM, Denon, Sony, and Yamaha (Fostex is sticking to hard disk for the time being) are expecting MD to follow the course of DAT, which first crashed and burned on the consumer front before making itself into a staple for professional audio use.

A LITTLE HISTORY

In theory, MD was going to be *the* consumer audio medium. It was extremely portable, affordable, and it presented users with the ability to record with near-CD clarity onto a disc smaller than a 3 1/2-inch floppy. Originally introduced by Sony in late 1992, the MiniDisc's failure to generate excitement stateside stemmed from a combination of a lack of software from record companies, the fact that most consumers were just beginning to accept the CD as a new medium, and that it was released simultaneously with Philips DCC (another format failure).

But, if you do remember, the DAT took the same wild ride. The consumer market rejected it, but the pro-audio

community took it under its wing and now it has become a studio staple. Meanwhile, the Japanese manufacturers aren't giving up on MiniDisc that easily — the format is selling like wild in Japan, so there is some justification to keep pushing it out the factory doors.

So why does pro audio need another storage medium? And why the MiniDisc format? Despite the fact that, after early listening tests, many believed that the MD used too much compression for pro applications, things are changing for MD. MD sound quality — thanks to Sony's v. 3.5 ATRAC (Adaptive TRansform Acoustic Coding) — has improved radically since the pro community gave it its first audition; in fact, this new generation of MD is specing out to near-DAT-quality sound.

Now that the bit-reduction algorithm has been perfected, MD can be considered for what it is — inexpensive, portable, digital, randomly accessible, rerecordable, and archivable. The magneto-optical process that is used in the recordable MDs ensures

that the discs themselves can be erased and recorded over a million times without degradation. You won't have to worry about any drop-out over time (which often occurs while using both standard and digital tape), because the magneto-optical process physically changes the magnetic element (terbium ferrite cobalt) that makes up one of the layers of the recordable disc in the recording process, so you don't have to worry about demagnetization.

THE SAME, BUT DIFFERENT

The MiniDisc comes in two different formats — MiniDisc Audio and MiniDisc Data. Sony specifically states in its protocol for MiniDisc Audio that there are two channels of audio (right and left) only. This format is the standard for most of the MiniDisc recorder/players that have been surfacing from Sony, TASCAM, and Denon for radio broadcast use. In fact, radio stations have been the first professionals to accept MD as a storage medium, finding it to be a fine replacement for the NAB cart.



IT'S BAAACK: An improved bit-rate compression scheme makes MiniDisc a viable studio contender.

"The ProMix 01 gives me the flexibility to control all the elements of a show from my computer. Superb sonic quality and remarkable features, you just can't beat it."

- Stan Miller, Sound Designer,
Neil Diamond Tour

"I bought four of them for the Steely Dan Tour, and I haven't shut up about the 01 yet."

- Roger Nichols, Engineer, Steely Dan

"Bottom line, the ProMix really does live up to all the hype. It's very quiet, it sounds great, it operates very cleanly." "One of the most amazing introductions in years."

- Recording Magazine, October 1994

"I did my latest project on the ProMix. And it's one of my best sounding yet. The ProMix 01 is really great!"

- Hans Zimmer, Composer, The Lion King

"ProMix 01 stands every chance of becoming a landmark product, changing the way a lot of people currently work."

- Studio Sound And Broadcast Engineering, July 1994

"We're not normally violent, but in this case, we're willing to make an exception. We're not letting this mixer go."

- Mix Magazine, November 1994

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the trimmin's
through

Songwriter/Musician

"As a sound designer, I create illusions. Yet, the power and flexibility of the ProMix is no illusion. It most certainly contributes to the prestige of Machine Head."

- Stephen Dewey,
Sound Designer/Founder, Machine Head

"After working with ProMix 01, I am convinced its sound, quality and flexibility rivals that of mixing consoles costing many times more."

- Calvin L. Harris, Engineer/Producer -
Lionel Richie, Diana Ross, Stevie Wonder

"My two ProMix 01s store all the parameters of my mix and play it back exactly as I heard it at the moment of creation. More importantly, they sound great!"

- David Schwartz, Composer for Northern Exposure

"Yamaha has done it again, just as it did in the early '80s with the DX-7 keyboard. It has created a cool piece of gear that does more, does it better, and costs less."

- EQ Magazine, December 1994

"It took Yamaha to create a brilliant sounding digital mixer with full MIDI control. I have no doubt that the ProMix 01 will quickly become an industry standard."

- Jeff Bova, Keyboardist/Arranger/Composer
- Vanessa Williams, Robert Palmer

"Clean, quiet, powerful. The best words I can think of to describe the ProMix 01, the latest addition to my toolbox."

- Tom Jung, Producer/Engineer/President, DMP Records



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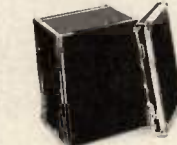


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FIRST LOOK

MiniDisc Data is Sony's most recent accomplishment, and it is the format that TASCAM, Yamaha, and Sony are using to create their new 4-track recorders. Originally, MiniDisc data was introduced by Sony as a computer-based storage medium. They created a MD drive that had a built-in ROM interface for the Mac or PC that would retail for about \$500, offering the ability to store about 100 MB per disc. Unfortunately for Sony, Iomega released the Jaz drive around the same time, which did basically the same thing for \$199, so the product never flew as a computer storage device.

What it did do was catch the eyes of the engineers at TASCAM, which prompted them to license the format from Sony to create the Digital Studio 564, the first MiniDisc-based Digital Studio. The 564 allows you to record five "virtual" tracks before you have to commit one to the arrangement, as well as a bounce-forward function that allows you to bounce tracks to another song location (file) on disk.

Yamaha made its own MiniDisc announcement at Musik Messe in Frankfurt last month, offering a 4-track, MD4X for about \$1200. The product is expected to debut stateside this fall. The 564 and the MD4X both give you the ability to bounce to any track, and it also provides full MIDI capability. The preliminary specs on the MD4X include a sampling rate of 44.1 kHz and a maximum recording time of 37 minutes for four tracks (74 minutes stereo, 148 minutes for mono).

Sony showed its recorder behind closed doors at NAMM and has yet to make any firm introduction announcement.

The big question has been whether or not these various machines will talk together. Could the MD resurface on the pro front as an incompatible format? Because of the open-ended nature of the MiniDisc Data datafile format, this could very well be the case. But according to sources in Japan, Sony, Yamaha, and TASCAM have all agreed on a format that will assure future users that multitrack MD's will talk from one brand recorder to the next.

So, if you thought MiniDisc was dead and buried, you may be dead wrong.

EQ

THE ULTIMATE 8-BUS ANALOG CONSOLE BECOMES MANIFEST APRIL 1996

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WRN

Stevie Wonder's "Superstition"

Mixers Gary Adante
and Rob Arbittier discuss
how the classic song
was caught live

BY STEVE LA CERRA

What format had the song been recorded on, digital or analog, and on what type of machine?

The song was recorded on a Sony 3348 digital tape machine. Because the concert featured a live band and orchestra, 48 tracks were needed to provide for adequate instrument separation in the mix. The orchestra was recorded into stereo mixes of sections (strings, brass, etc.) and the harp was recorded onto its own track.

How was mixing this song different from mixing a studio recording?

As long as a live performance is carefully recorded, as this one was, there's really no difference. You try to make the tracks sound as much as possible like a studio recording, then you add ambience. If the live recording is not made well, there's a lot of cleanup work and fixing to do. The song was mixed at Noisy Neighbors Productions in Los Angeles. It was mixed using a combination of Timeline StudioFrame 1000 virtual digital consoles (32-channel) and Yamaha ProMix01's, both of which were automated via MIDI. No fixing or overdubbing was needed for "Superstition." The project was mixed to a Sony PCM-9000.

Did you have any problems with leakage of sounds into various mics?

Leakage was not a big problem. The mic selection and placement were good, and many of the performers wore ear monitors. To reduce the inevitable leakage that did make it to tape, we gated some of the drums and several of the tracks that were used only occasionally throughout the song. We primarily used the gates and

compressors that are built into the StudioFrame. There weren't any phase problems due to leakage, and there was not a major drum leakage problem with the vocal mics. There's always some leakage, but there wasn't enough to cause a problem. There was no off-stage amplification.

Did you incorporate the sound of the real hall into the mix? Did you use digital reverb units to help complement that sound?

We did use digital reverb to augment the live sound of the concert hall. Although the recording had a nice live ambience to it, reverb was needed on tracks that were either close-miked (e.g., vocals) or directly input to the console (e.g., synthesizers). We primarily used a combination of Lexicon PCM 80 and Roland R-880.

Were the audience mics mixed in to help give the song a live feel?

Yes. The audience was recorded in stereo and the tracks were used in the mix to re-create the excitement of a live performance. The audience tracks were ridden slightly between songs, but pretty much left at a set level during the songs.

Was the leakage from [stage] monitors into the microphones a major problem? How did you deal with it?

Monitor leakage was not a major problem because Stevie, the other singers, and the orchestra players used ear monitors. CMCI designed the ear monitor system that not only reduced monitor leakage, but enabled the wearers to have independent control over their own mix during the show.

Were the instruments recorded with EQ, compression, and effects? Or did you add those things during the mix?

For the most part, instruments were recorded with very subtle EQ and compression and no effects. This gave us maximum flexibility during the mix. The only effect added in the mix was reverb. The lead vocal was EQ'd and compressed using the StudioFrame virtual console. No outboard compression or EQ was needed.

EQ



WONDER-FUL TONIGHT: Stevie Wonder's live performances are captured on *Natural Wonder*.

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and smooth presets...the display is big, bright and packed with information...friendly, easy-to-understand icons at every turn...this user interface is one of the best we've seen,...A+ for Sony."^{***}

What more can we say? For more information, call 1-800-635-SONY, ext. MP5.

SONY

Alanis Morissette's "Ironie"

Producer Glen Ballard
and engineer Chris Fogel
discuss Alanis's hit

BY LIANA JONAS

EQ: Since Alanis's vocal tracks on the disc were recorded at your project studio, what procedures were taken to make them sound "commercial"?

Glen Ballard: I used an AKG C12 with a Demeter tube preamp and an LA-2A tube compressor going straight to tape. Alanis has such a rich tone and such incredible dynamics, and the C12 seemed to capture all of her nuances.

What tape format was used?

Fogel: Alesis ADAT was the primary format used. Levels were usually printed very hot to tape, even tickling the red at times. I find that when you really use up those bits, the ADAT is a pretty good mirror image of your source sound. And the editing capabilities of the ADAT with the BRC are addicting. I know that if I need to fly a guitar from verse 1 to verse 3, using beats and bars, the offset is going to be perfect. What once took an hour now takes 10 minutes. Additionally, analog tape was used on some guitars and for mixdown.

What polar pattern was the vocal mic set to, and why?

Fogel: The C12 was set to a cardioid pattern primarily because of the size of the room Alanis sang in. It is a very small closet-like space that is loaded with early reflections, so we needed the most direct vocal we could get.

Was there a lot of gain riding, or was the vocal compressed?

Fogel: Both. If the vocal was too hot in the choruses and second verse, we simply rode the level to tape with the compressor's output. In the intro and break sections, the compression ratio was set to zero. We wanted a very intimate sound in those sections, and I felt that the compression was taking us away from that.

Was there any kind of doubling done in the chorus?

Fogel: There was no actual sung doubling in the chorus, but there were some harmonies. I used a very subtle doubling effect in the choruses and bridge.

How was Alanis's vocal processed in the bridge?

Fogel: A combination of the above doubling effect (which was essentially a ± 2 cent pitch shift with left/right delays of 12 ms and 25 ms, respectively) and a very wide and fast flanger were really all that was used for the effect. Additionally, the "Wood Room" patch in the Yamaha SPX-990 was used to add a little ambience.

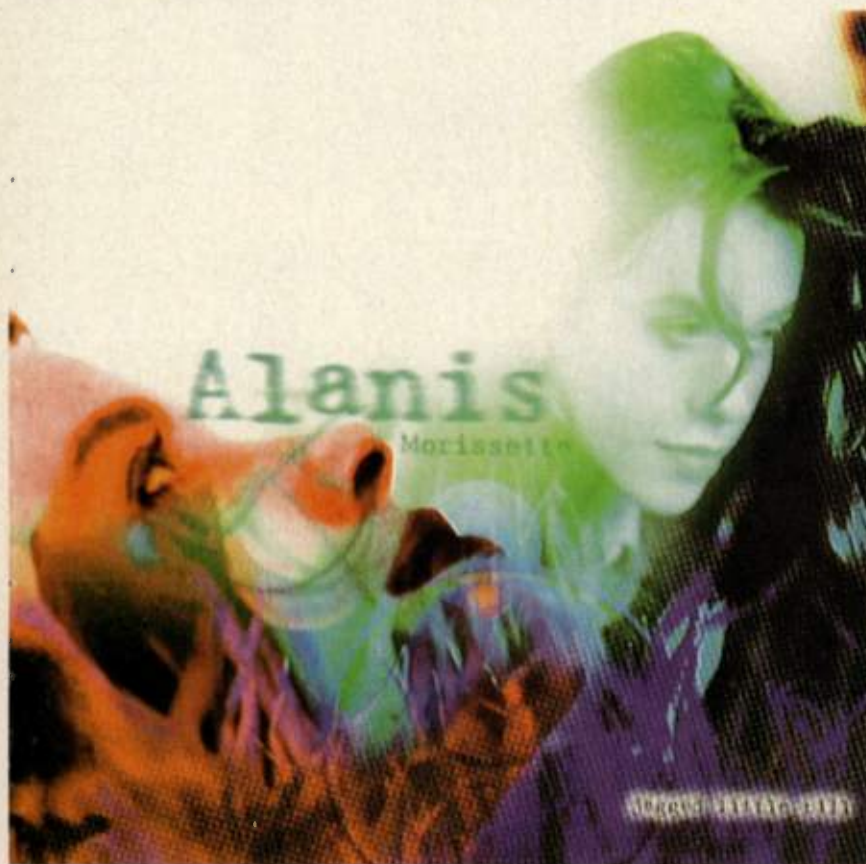
Was there ever a problem with sibilance in Alanis's vocal?

Fogel: We had minor sibilance problems, which I tried curing with a de-esser in the mix. But Alanis is so in touch with her own voice that she knew immediately when I was doing something "unnatural" to it. In fact, there are some cases in which I actually had to add an "s-sound" to her vocal.

What kind of organ was played? Was it miked or did it go direct?

Fogel: A Hammond B-3 with a Leslie cabinet. I never take organs direct, particularly when played through a Leslie. I usually triple-mic the cabinet, with a large diaphragm mic on the bottom and a pair of high-resolution condensers on the top at about 10 o'clock and 2 o'clock from the horn. Some people like to place the top mics on opposite sides of the cabinet, but then the movement of the rotor completely cancels itself out, and that movement is what's so great about that organ/cabinet combination.

EQ



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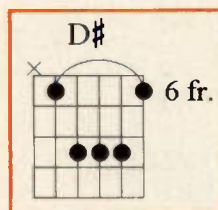
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The Scoop on Poop

STUDIO NAME: Poop Alley

LOCATION: Los Angeles, CA

KEY CREW: Tom Grimley, owner

CREDITS: Some of the artists that Grimley has worked with include The Rentals, that dog., Slug, Geraldine Fibbers, Spain, Lowercase, Beck, Polar Goldie Cats, Charles Brown Superstar, Far Flung, and Tattle Tale. He has recently released a double CD set called *The Poop Alley Tapes* [Win Records] with songs from 31 L.A. bands that have recorded there.

CONSOLE: Studiomixer II (17x8)

TAPE MACHINE: Teac 85-16 (w/dbx)

MONITORS: Tannoy PBM-8

MICROPHONES: Coles ribbon microphone; Altec saltshaker [see MicroPhile, Jan. '96]; Langevin CR3A condenser; P-tapes modified piezo dynamic; AKG D12E

PREAMPS: Magnasync model 444 4x1 location mic mixer (tube); Magnasync model x400 recording amplifier (tube) [P-tapes modified]; Dukane 1B665a mono (tube); RCA model BN17a remote amplifier 4x1 mic mixer;

Ampex MX10 4x2 mic mixers (tube) [2]

OUTBOARD EFFECTS: Metron 26J-1 autolevel amplifier (tube); SKL 302 dual variable electronic filter (tube); Marlboro quadra sound blender; Ashly Audio SC50 peak limiter compressor; Korg FK1

KEYBOARDS: Moog Source; Optigan; Realistic Concertmate MG1; Fender Rhodes 73 (student model)

DIGITAL EDITING: Turtle Beach 56k

STUDIO NOTES: Tom Grimley states: This place is an old warehouse, so the acoustics are pretty great. There's a very strange thing happening between my ceiling and floor that gives me a really great sound, although it kind of screws up the cymbals. I also use a lot of trashy mics, which give me different colors. Depending on the mic, it sounds completely different — especially with room mics. For example, I use a piezo buzzer [mic] placed in a styrofoam cup which in turn is placed in a speaker enclosure. It's a very honky sound.

I record everything in the main

room. You hear a lot of crap from the used tire place next door. There's always a lot of people hanging out there playing hip-hop music. It's great. All environmental sounds are left in.

I promote the idea of bands using things in the studio — letting them do it themselves. Here, bands have a huge say in the process. Sometimes they even mix their own stuff. I set it all up and answer questions. I try to teach them as we go through the process so they know not just *if* a record sounds good, but also *why*.

EQUIPMENT NOTES: Grimley continues: My console is pretty unique, and I don't know much about it, but I love it. I love the way it looks with its large knobs and huge VU meters. All the new boards today have such tiny buttons. Plus, I know the 17x8 configuration is weird, but at least I can skip 13. My other favorite things are the Ampex preamps and my Metron limiter because they both sound amazing. I have a lot of weird stuff. **EQ**



WHAT'S GOING ON AT ONE OF L.A.'S FAVORITE ALTERNATIVE HAUNTS

Photo by Edward Colver

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The new AUTOCOM stereo Compressor/Limiter/Expander/Enhancer has been designed to solve this problem. Our exclusive new dynamic enhancer circuitry restores the *perceived* loss of higher frequencies that occurs during compression, ensuring your mix always retains its original brightness and energy.

Exceptionally versatile by design, the AUTOCOM now also features a unique IRC (Interactive Ratio Control) Downward Expander/Gate which reacts intuitively to the program material to produce an exceptionally natural sound.

Built-in Auto and Manual Compression modes give you more options—from "set and forget" to a wide range of fully adjustable Attack and Release times for creative effects. Our unique Wave Adaptive compression circuitry delivers "inaudible" compression every time you use it.

AUTOCOM from Behringer. The dynamic new way to put life back into your music.



Your Ear Is Our Judge

For a copy of Behringer's dynamic full-line brochure, please call (516) 364-2244, fax (516) 364-3888 or write Samson Technologies Corp., Box 9031, Syosset, NY 11791-9031.

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CIRCLE 13 ON FREE INFO CARD

KRK: Up Close

Rok•Bottom

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



K•RoK

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



extremely accurate reproduction of instruments and vocals. Perfect for all near-field applications, the K•RoKs not only out perform the competition, they also represent an incredible value at \$495.00 per pair.

NEW

POWER BLoK

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



NEW



*Keith Klawitter
Captain K•RoK*

Keith Klawitter,

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



*Chris Fichera
with KRK mascot, "Pinky"*

Chris Fichera,

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

And Personal

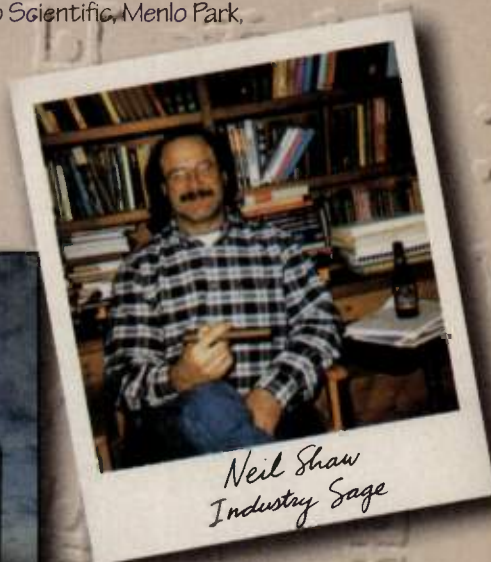
Imaging Is Everything

KRK monitors have become an integral tool in many of the world's top recording and post-production studios. The KRK line of near field monitors are without peer for accuracy and imaging. Each driver is extensively tested to ensure a zero failure rate out of the box and monitor pairs are matched to within one-tenth of a decibel for unequalled accuracy. With a complete family of near-field products to choose from, KRK has a product for every application, including video-shielded and powered versions.

Questions About The Universe?

Just ask Neil.

Neil Shaw, Menlo Scientific, Menlo Park, California



Neil Shaw
Industry Sage



NEW

Veneer Options

If the "granite-type" look in a monitor is not your cup of tea, KRK offers veneered versions to complement the most demanding interior. Available in attractive oak or rosewood, the optional models include the K-RoK, 6000, 7000B and 9000B. They are also available in powered and non-powered versions and with optional video shielding.



KRK Old RoK Dude

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Distributed by Group One Ltd.

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KRK Systems, Inc.

16612 Burke Lane • Huntington Beach, CA 92647

(714) 841-1600 • (714) 375-6496

E-mail: krksys@msn.com

CIRCLE 47 ON FREE INFO CARD

WRN

Spencer for Hire

STUDIO NAME: Great Interface Recording

LOCATION: SoHo, New York

KEY PEOPLE: Spencer Andre and Nick Heathen (producers); Lloyd "Flash" Lieberman (chief engineer)

PROJECTS RECORDED: Projects for labels such as Atlantic, Elektra, Tommy Boy, EMI, 4th and Broadway, and Fabulicious Vinyl (their own), and acts like Red Nation, KRS-One, and Queen Latifah

CONSOLE: Trident Series 65 Mark III 28x24

RECORDERS: MCI JH114 (1980) 24-track 2-inch with autolocator II; MCI JH24 (1973) 24-track 2-inch (with 16- and 8-track heads) with autolocator III; Otari MX 5050 8-track 1/2-inch; Sony DTC-77ES DAT and DTC-D10 portable DAT; Hitachi 3-head d-E66

MICS: Milab DC96; CAD Equitek E-100 [2] and CAD 22 [2]; Shure Beta 57 [2] and SM57 [2]; Sennheiser 421; Neumann U67; AKG C24 tube and C12A [2]; Electro-Voice RE20; Astatic CTM 901

Montior 1; custom enclosures with Electro-Voice components

AMPLIFIERS: UREI 6260 (monitors); Dynaco stereo vintage amp

MIDI & KEYBOARDS: Ensoniq ASR-10, ESM mod, and EX-6 stereo op expander; Yamaha DX7, TX812 mod (FM tone generator), and F01 mod (FM tone generator); Korg T2; Roland D-50 and MS 70 mod (super JX); Juno 106; Akai S-900 with update; Alesis HR16 drum machine; Oberheim Matrix 6R; Polysix

COMPUTERS & SOFTWARE: Atari 520 ST with Dr. T Omega software; Apple Power Mac 8100 with Emagic Logic, Mark of the Unicorn Digital Performer, Digidesign Pro Tools, and Opcode Studio Vision Pro 3.0; JLCopier PPS-100 sync/stripe

OUTBOARD GEAR: Ursa Major 323 reverb; Lexicon PCM 42 delay and PCM 70 [2]; Roland SDE 2500 delay; Ibanez SRV 2000 reverb [2]; Korg DRV 1000 reverb and SDD 2000 sampling reverb; dbx 903 compressor [5], 163A compressor

[2], and 160A compressor/limiter; Symetrix 544 expander/gate; Dyna-mite stereo expand/limiter/gate; Audio Logic MT44 noise gate; Tektronix 764 Digital Audio Monitor; Fairchild compressor; Pultec EQs [2]

EQUIPMENT NOTES: Spencer Andre notes: We have an unorthodox approach to music; we like breaking rules such as EQ'ing radically and sending bumped-up stuff to Pro Tools and back to tape — we've had some incredible results. We've found that sampling live parts and treating them like a sequence really adds that special flavor.

STUDIO NOTES: Andre continues: Located in the heart of SoHo, NY, this studio started as a pathetic 4-track stuck in a fur vault. We upgraded to its current state by knocking a hole in the three-foot thick vault wall and Nick single-handedly designed and built a state-of-the-art control room totally free-floating, acoustically correct, and suspended by 3.2 ton springs. **EQ**



Photo by Julian Jaime

A ONE-TIME FUR VAULT IS NOW HOME TO THIS SOHO-BASED STUDIO

"So, how 'bout the truth? I know quality, I know power, and I really know sound...PowerLights are the best."

Michael Adams

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Output Power in Watts per Channel

Model	8Ω *	4Ω *	2Ω **
PowerLight 1.0	200 Watts	325 Watts	500 Watts
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PowerLight 1.8	400 Watts	850 Watts	900 Watts
PowerLight 4.0	900 Watts	1400 Watts	2000 Watts

*20 Hz-20 kHz, 0.1% THD, ** 1 kHz, 1% THD

What makes PowerLight amps work so well?

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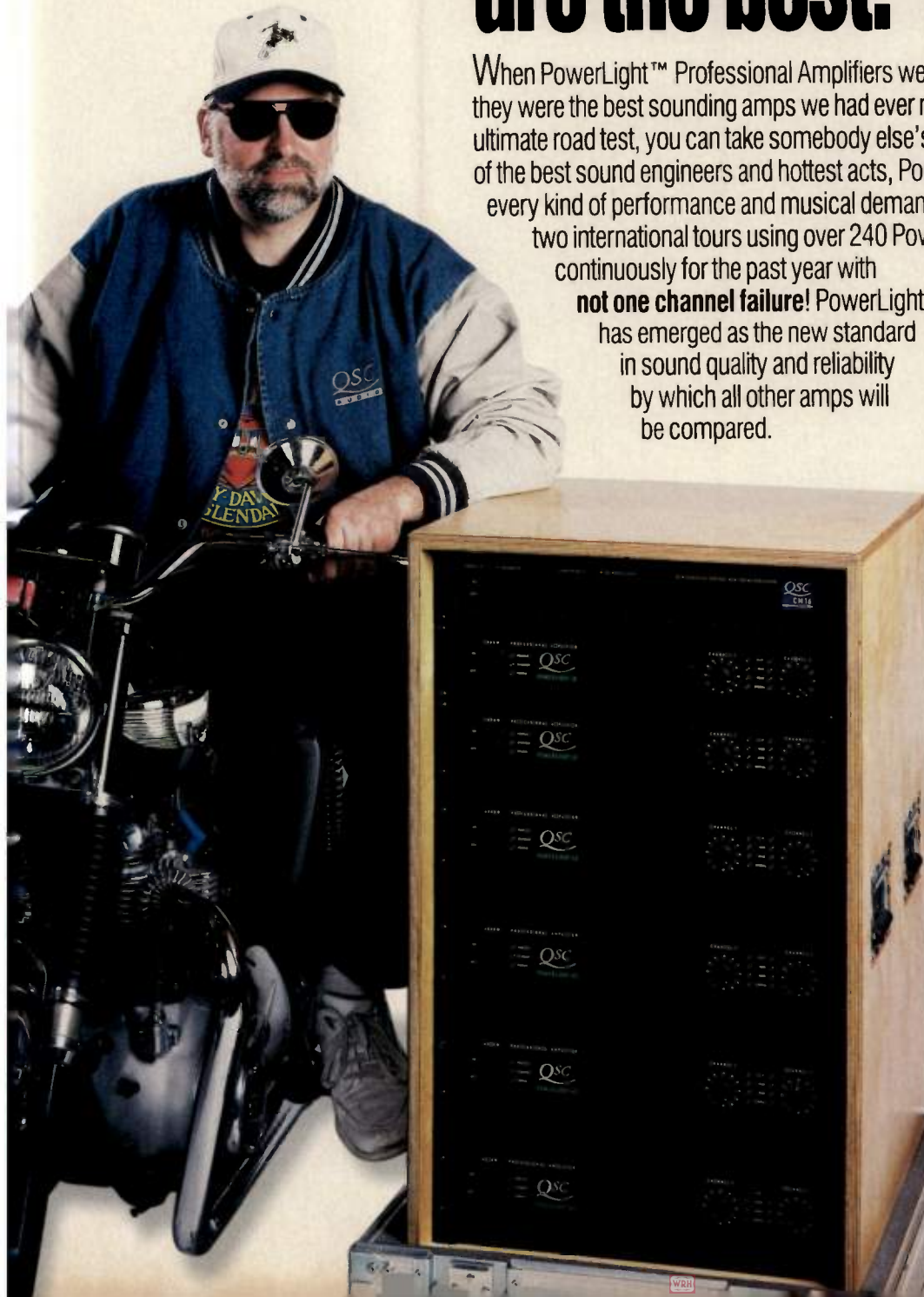
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CIRCLE 66 ON FREE INFO CARD



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A 14-Channel Digital Mixer

The VS-880 comes with a 14-channel digital mixer with digital EQ. Fader, pan and mixer parameters can be automated by MIDI control change messages. Internal snapshot automation is included.

An 8x8/64 Virtual Track Digital Recorder

Eight primary tracks with eight levels of virtual tracks give you the ultimate in recording flexibility. Record multiple takes, edit or undo edits and compile the best parts of various takes to create the perfect track without compromise. You can accumulate up to 64 instantly accessible tracks and choose eight for final mixdown.

Digital Mastering

The VS-880 is fully digital and has digital in and out. This makes it compatible with all your existing digital equipment, both linear tape-based and non-linear hard disk format.

Digital Editing

With the VS-880, you get fully non-destructive editing capabilities. You can copy, move, exchange, insert, cut and erase tracks. Because it functions like a word processor, you can select the perfect chorus of your song, copy it or move it somewhere else without re-recording it. Or cut out another section and have the remaining material slide over and fill the open space automatically. And if you're not satisfied with a particular edit, simply return to the previous performance. Instant locate points make editing on the VS-880 as user-friendly as it gets. For advanced applications, functions like Scrub Preview or Time Compression/Expansion are available.



The user installable VS8F-1 Effect Expansion Board adds two completely independent stereo multi-effects processors. There are 200 patches, extensive effects including 3-D RSS capability, and guitar effects chains with COSM-based guitar amp simulator.

Two Digital Effects Processors

A VS8F-1 Effect Expansion Board can be easily user-installed, giving you two totally independent multi-effects processors. Reverb, stereo delay, chorus, flanging, vocoder as well as distortion/overdrive and guitar amp simulation are a few of the effects that can be added during recording or during final mix in realtime. Three dimensional effects based on Roland's proprietary RSS[®] system are also included.

Digital Memory

You can choose the type of memory which best suits your needs. Select a 540 MB internal drive or an internal 1 Gigabyte removable Iomega[®] JAZ[®] drive capable of 500 minutes of recording time. A standard SCSI port allows for easy connection to external drives such as Iomega[®] ZIP[®], magnetic optical or other storage media.

Synchronization

The VS-880 is MIDI compatible for synchronization with MIDI Time Code (MTC) as both a master or slave. MIDI Machine Control (MMC) also allows automated transport control, putting playback, fast forward, rewind and more at your fingertips.

It's time to turn your home or workplace into the studio you've always wanted. Call (213) 685-5141, ext. 798 to order a free demonstration video.



The rear panel has four RCA and four 1/4" inputs, digital in/out, MIDI in/out for sync and automation, a programmable footswitch input, headphone jack, two aux sends, master outs, and a SCSI port for archiving or adding additional storage devices.

VS Studio
VS-880

Roland



Roland Corporation U.S., 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685-5141 Roland Canada Music Ltd., 5480 Parkwood Way, Richmond, B.C. V6V 2M4 (604) 270-6626
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CIRCLE 67 ON FREE INFO CARD

RCA BK-5A

EQ takes a look back
at this nearly forgotten
RCA classic ribbon
microphone

MICROPHONE NAME: RCA BK-5A
FROM THE COLLECTION OF: David Handloff, More Music (Santa Cruz, CA)
PRICE: \$146.50 (in 1961)
TYPE OF MIC: Ribbon
POLAR PATTERN: Unidirectional (cardioid)
FREQUENCY RESPONSE: 50 Hz to 15 kHz (no tolerance stated)
EFFECTIVE OUTPUT LEVEL AT 1000 HZ: -56 dBm
OUTPUT IMPEDANCE: 250 ohms (may be changed to 30 or 150 ohms)
HUM PICKUP LEVEL: -128 dBm
DIMENSIONS: 7 x 2.75 x 2.875 inches
WEIGHT: 1 pound, 11 ounces (excluding cable)
MIC NOTES: The RCA BK-5A was not considered as glamorous (or as popular) as its RCA contemporaries, the 77 and the 44, but it was one of the best microphones that RCA made at the time. The BK-5A had similar characteristics to the 77, but was better equipped to handle sounds with a higher SPL. A unique feature of the BK-5A microphone was the blast filter consisting of two separate layers of cloth supported by perforated metal screens. According to an RCA catalog (circa 1961), "The filters effectively reduce damage to the microphone from gun blasts and other loud noises encountered in broadcast programming." Available as an accessory was a large windscreen that looked something like a softball. RCA's BK-5A was manufactured from the late 1950s through the early 1970s, and a mic in good condition today can fetch up to \$1000. (Technical data courtesy of Bruce Swedien and Clarence Kane at Enak Mic Repair.)
USER TIPS: David Handloff of More Music

comments about his use of this vintage microphone: I used the BK-5A to record a voiceover to a soundtrack that had been recorded on an Alesis ADAT. The BK-5A was routed through an old Ampex tube microphone mixer and then recorded onto an Ampex 350 series (tube) half-track tape machine. I used a high-pass filter at approximately

70 cycles and no equalization. The mic has an amazingly soothing, big sound that can fatten up an otherwise thin vocalist. I'd call it a crooner's microphone — it reminded me of the sound that you'd hear on the old Bing Crosby records. RCA had a yoke that was sold for the BK-5A, but the one shown in this photograph was made by AKG. 



Photo by Bill Reynolds

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STUDIO SERIES

The PCM 90 & PCM 80: so good, you'll need both.



Introducing the PCM 90 Digital Reverberator. It's the latest addition to Lexicon's great-sounding line of effects systems, joining the acclaimed PCM 80 Effects Processor. Individually, they're impressive; together, they're phenomenal.

The PCM 90: optimized for reverb. 250 new programs from Lexicon's most famous algorithms — specifically for music production, audio post and sound design — drawn from Lexicon's top-of-the-line processors. Available for the first time in a compact, affordable package.

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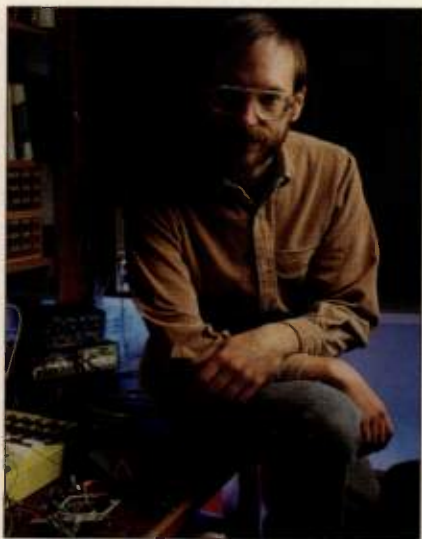
Which to buy? Take our advice — get both. The PCM 90 and PCM 80 are totally complementary. The ultimate quality reverb; the leader in astounding effects; both with that special Lexicon sound. Try them at your authorized Lexicon dealer — you'll want to keep this perfect pair together.

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WRN

Coming Clean



Sometimes it's the little things that count

BY CRAIG ANDERTON

Maintenance is a necessary part of life. Sure, it's more fun to spend time creating rather than maintaining, but, paradoxically, a well-maintained studio will actually let you create more because it will run smoothly and cause fewer interruptions.

Some aspects of maintenance are obvious, like cleaning the heads on a tape recorder or defragmenting a hard drive. Others are less obvious, such as those that deal with organization — which is really just another facet of maintenance — or little hardware tweaks. Here are some tips I've learned over the years that have helped my studio run just a bit less chaotically than normal.

MAINTAINING YOUR MANUALS

With today's complicated gear and operating systems, you need instant access to manuals. I put everything in three-ring binders. Most manuals for signal processors and other smaller pieces of gear are sheets of paper folded over once and stapled in the middle. Remove the staples and use a

paper cutter to separate the pages. Get a three-ring punch, and voilà — a manual ready for three-ring binding.

For those weird little manuals and sheets of paper that aren't 8.5 x 11 inches, you can buy three-ring punched pouches at any office supply store. Slip the manual in the pouch and put the pouch in the binder. File alphabetically by company. Pouches are also good for those little plastic "cheat sheets" and other inserts that come with gear.

While we're on the subject of manuals, mark 'em up! If there's an errata sheet, make the corrections in the manual. Write down tech support phone numbers, the serial number, date acquired, any bugs you find, and other useful info. On the manuals for audio sample CDs, if you use a particular sample, mark it; and if you run across a sample that's exceptionally good, put a little plus or other symbol next to it.

MAINTAINING YOUR CONTROLS

Your gear likes to be used. About once a month, flip all the switches, press each pushbutton, play each key on a synth, rotate any controls, and slide any sliders over their full travel several times. Many of these parts have self-wiping contacts, and using them prevents oxidation. The one exception is membrane keyboards (e.g., as in the original Yamaha DX7). These have a tendency to fail by shorting out, and are rated at a certain number of operations. Because they are hermetically sealed and usually use conductive plastic, they are not as subject to oxidation problems.

Jack contacts also need to be "worked," as many jacks use switching contacts that can oxidize. Plug and unplug plugs several times into all jacks not just for the benefit of switching contacts, but also to keep the various pins and contacts free of corrosion. This tip applies to patchbays as well.

MAINTAINING DUST-FREE ENVIRONMENTS

Endust for Electronics is a new product that's designed specifically for electronic gear, and it works. As an experiment, I got a can and wiped one key-

board in the rack with Endust for Electronics, and another keyboard with a soft, damp cloth. After a week, the keyboard treated with Endust was still pretty dust-free, whereas the untreated 'board had a layer thick enough to write "wash me." That was enough to convince me as to the product's efficacy, as well as mention it to *EQ* readers. Studio supply places should bundle this with a Dustbuster for those who want to keep dust to a minimum.

One other dust tip: If you've just finished building a studio space, take a rubber mallet and whack the ceilings and walls. It will shake loose a bunch of dust that would take months to float down otherwise.

MAINTAINING YOUR TAPE COLLECTION

Organizing all those DATs, cassettes, and S-VHS or Hi8 tapes can be a major effort. After several years of unsuccessful attempts at organization, I finally came up with a method that, while not perfect, is simple and does the job.

Assign every tape for each different format a three-digit number, and keep a list in a three-ring binder of what's on each tape. If you have particular categories — for example, regular clients or specific types of music — add a letter prefix. This lets you group all tapes of a certain "family" together on a shelf according to prefix, but you still have the advantage of easily looking up the number in the binder to see exactly what's on a tape.

MAINTAINING YOUR CONTACTS

If you don't have a database in your computer, you should. You can add as many fields as you want — not just phone numbers and addresses, but birthdays, names of significant others, whether they received the latest mailing about your studio, how fast they pay their bills, e-mail or Web page addresses, etc. Keeping all your records in one easily updatable place can be extremely convenient, especially if it's in a laptop or other "instant-on" type of computer. Just don't forget to back up this information religiously!

MAINTAINING YOUR ILLUMINATION

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Recording Magazine

"As close as we've seen to a magic black box, the BBE 462 is probably the most cost-effective improvement you can add to your rig."

Guitar Player Magazine

"Listening on a variety of loudspeakers - JBL, KRK, Meyer, Tannoy, Yamaha and a few lesser-known names - I discovered that the BBE Process provided a nice punch to older recordings without being brittle or shrill. The LF contour emphasized the bottom end, without undue boominess."

MIX Magazine

"All of the mixes we played gained extra sparkle and clarity when processed with the BBE 462."

Keyboard Magazine

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CIRCLE 91 ON FREE INFO CARD

with a compact fluorescent type. They cost more initially than regular incandescent bulbs, but the payback in energy savings and replacement costs is significant. The latest generation doesn't produce the buzzing and other types of interference associated with the old-style fluorescents that required ballast and transformers. And if you're ecologically-minded, compact fluorescents deliver far more light for a given wattage than incandescent types, while generating much less heat.

Tax tip: Many people forget that the cost of replacing a light bulb in an area devoted exclusively to work qualifies as a repair, and is therefore a deductible expense.

MAINTAINING YOUR JUICE

An uninterruptible power supply will maintain a constant source of AC power in the face of brownouts, blackouts, and UFOs flying overhead (those pesky little things can cause all sorts of power problems). Seriously, though, if you've ever had the power fail during a write operation to a hard drive or while a tape is in high-speed rewind mode, you'll appreciate the protection this type of device affords. Think of it as insurance: It may not be cheap (several hundred dollars), but without it, thousands of dollars of gear can be damaged in the event of a serious power problem.

MAINTAINING YOUR SPEAKERS

This is a preventive maintenance technique: insert a fast-blow, low-amperage fuse (I use 1/2 Amp types) in series with your speaker. Golden-ear types will tell you that pushing current through that little tiny piece of wire will degrade the sound; tell them that if they're willing to pay for blown tweeters, you'll follow their advice. Just remember not to use slow-blow fuses, as they will not blow until it's too late. I used to blow a speaker every year or so (oops, shouldn't have the effects send turned up on the channel providing the effects return...) until I figured out this solution.

MAINTAINING YOUR SANITY

Actually, I don't have any tips on this one. If you do, send 'em to me c/o EQ!

EQ

THE 1996 WINTER NAMM "ANDERTON AWARDS"

Due to popular demand from people who obviously have too much time on their hands, here is the "Virtual Awards Show" that bestows 10 minutes of fame, fortune, and little else on those deserving of same. Sit back, relax, and cheer or jeer as the judge opens the envelopes...

TASCAM picked up the "Bram Stoker Memorial Undead" Award for resurrecting the MiniDisc from funny-format land and figuring out something useful to do with it.

The "Booth Of The Show" Award goes to Greytounds, for their analog synth museum. It was like being back in the '70s, but without all those annoying people in white disco jackets taking Quaaludes.

The "Good Things Come In Small Packages" Award was a shoo-in for Roland's PMA-5, a Newton-like, handheld MIDI tone generator and sequencer with a pen interface. Truly nifty.

The "Turtle and the Hare" award goes to the klunky Windows interface, which became Windows 95 and overtook the rabbit while it was busy congratulating itself for having thought of Windows 95's best features first. Unfortunately for the hare, consumers don't really care about who got there first, but who does what now.

Yamaha won the "Eureka — So That's What Software Is For!" Award by offering the first major software updates for existing products (W5, W7, and VL1) in the company's history.

After winning the "You Need A New Computer To Run Our Stuff" Award for the past five years, Digidesign relinquished the Anderton's Award Plaque (which forms on your teeth but can be eliminated by regular brushing) to software synthesizers. Yeah, they sound good and it's a fun idea, but I need to spend the cost of a really nice hardware synth to upgrade my computer to the point where it can run a software synth.

Kurzweil was the only nominee in the "Swag Engineering For Freeloading Journalists" category. Hey, a lot of companies didn't even have press kits, for chrissakes! I guess that web sites, where you can spread your own propaganda with wild abandon, has replaced getting coverage from those pesky journalists who keep asking embarrassing questions like "When is the product you announced last year actually coming out?"

The judges unanimously awarded the "Weird Ass Little Box" Award to Zoom for their 7010 Fire, a multieffects box that's a little larger than a pack of cigarettes with a built-in amplifier and flip-up speaker. If you can't annoy your roommate with this, you're not trying.

The "It Came From Outer Space" Award goes to Line 6 for the AxSys 212 Digital Guitar System. A guitar amp? That sounds really good? From a company that didn't exist before the show? Not to worry, it's Fast Forward's latest project, a company that has put its consulting stamp on products from Alesis, Dynacord, and Digidesign.

The "Credit Where Credit Is Due" Award goes to guitarists. They may be the butt of jokes, but face it, they kept the flame burning for tubes long after the fickle public proclaimed that the digital signal path was the only way to go. So there.

The "Elvis Presley Memorial Viva Las Vegas" Award goes to the rumor-mongers who think the NAMM show will move to Vegas next year. Anyone for "Siegfried and Roy do MIDI?"

The World Wide Web walked away with the "Hi, We're The Bandwagon, Please Jump On Us" Award. Last year, people asked "What's the Web?" This year, it seemed every company had a Web site, and the mark of business card status was not having your name in kanji on the other side, but having a Web-site address. For more information, go to <http://www.anderton~awards.com> (hey, it's a joke!).

Well, that wraps up this year's awards ceremony. Until next time, may your tubes never burn out, your hard disk never crash, and your computer remain viable for more than three weeks.

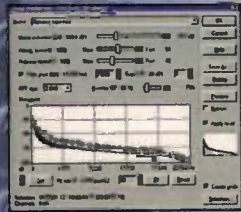
—Craig Anderton

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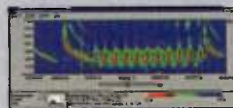
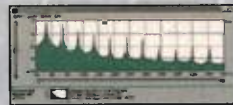
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CIRCLE 71 ON FREE INFO CARD

Used But Not Abused

How to buy a used recording console

BY BENNET SPIELVOGEL

You've kept an eye on the ads and asked friends and colleagues to be on the lookout; now you've finally found a used console that interests you. Before you back up the truck, lower the hydraulic lift, and break out the dolly, though, there are a few things to consider (beside making sure all the VUs light up and you can land a small helicopter on its surface).

There are tools to bring onsite, basic questions you need to ask the seller, and some simple test procedures to perform. Avoid getting misty-eyed over the initial glow you get when you first walk in and look at your console-to-be. Remember, paying for a console that will require big bucks to get operational can put a studio out of business fast. Changing pots and switches is time consuming and labor intensive. Do the simple tests yourself and weed out the loser consoles quickly and efficiently. If it's a contender, call your maintenance guru and pay his or her fee for a professional evaluation.

TOOLING UP

These tools will get you through the basic examination:

- Retractable 20-foot steel tape measure
- Test-tone generator (or small keyboard with a line out)
- Countryman direct box
- A volt meter (multimeter)
- Assorted patch cords and adapters
- A known good mic cable
- A pre-prepared DAT tape
- DAT machine
- A roll of masking tape

The initial tests involve the test-tone generator. The Teac TO-122A, about the size of a cigarette pack, produces six frequencies from 40 Hz to 15 kHz and is inexpensive. Among other things, the tones let you look at

the consistency from module to module, test switches and relays, and determine if all the mic inputs, aux sends, returns, and busses work.

DEAF TONE DAT

Test tones don't generate much soul, so a DAT prepared in your own room clues you to the sound of the console and functionality of the EQ. Use clean vocal performances from your multitrack masters and bring them to a single DAT track. Try to get solo male and solo female vocals. Follow that with some group harmony vocals if you have them.

Put a solid rhythm section up and record a track of kick, followed by snare. Go for individual drum tracks that contain bleed, and if there's a room mic, record some of that. Add a few particularly difficult tracks, such as an electric guitar with a lot of hum, a poorly recorded sax solo — anything that you've had trouble with, along with some great stuff. Close the DAT tape with some of your

favorite mixes (these can be your own mixes or CDs that you use for reference). The mixes should be stereo. Make all other DAT tracks a single (mono) track. Finally, log and ID all your selections so you can move and choose efficiently.

BEFORE YOU GO

Call the seller to determine if the console will be available to you for about an hour. Ask if someone who's operated the console will be there to: 1) answer questions; 2) give you the nickel tour; and 3) assist with your tests. Find out if the console is in service. If not, will they provide monitor speakers and an amp?

GENERAL EVALUATION

If the console is already powered up when you arrive, have the engineer power it down. While the console cools, ask the engineer about its history (one owner, many owners), why they're selling it, what quirks it has, and if it's ever been modified. Do any special features



Illustration by Mike Browne

AMEK

The EQ

The tradition

The pedigree

System 9098 Equalizer
by Rupert Neve the Designer



"The SYSTEM 9098 EQ is a high performance Equalizer and Preamplifier designed to originate microphone signals of the highest quality and to process signals generally in terms of frequency response. The circuitry is based on the research I put into the 9098 console and the approach bears many similarities to that used in the 9098. Paramount importance has been given to the sonic quality of the audio path, taking great care to retain the highly-prized musical character of the famous old designs of this pedigree."

The SYSTEM 9098 EQ embodies the original curve shapes now enhanced by improved circuitry which provides swept frequency bands in place of the discrete switched steps of the past. Thus the EQ has become even

more powerful yet remains a subtle and creative tool, using the same basic circuit configurations which have been successful over many years. However, new amplifying devices and better quality components have resulted in lower noise, lower distortion and the ability to handle higher frequencies.

The result is an equalizer which has the solidity and sound of Class A without the cost, heat and weight penalties and thus provides the 'best of both worlds'. We have also left behind cumbersome and expensive hand cabling, noisy connectors, heavy separate power supplies and outdated assembly techniques which contribute nothing but nostalgia. Apart from the robustness, repeatability and reliability, we have now made one of my designs more affordable than ever before."

Rupert



The System 9098 EQ is a Stereo 1U, 19" rack size, 100Watt unit. 2 Years free warranty.

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CIRCLE 07 ON FREE INFO CARD



exist? Any particular features they like or dislike? Are any spare parts included? Are service records and documentation available? Pay close attention to how your questions are answered.

Don't be quick to reposer the console. Let it cool down. Older consoles can be a little idiosyncratic when first powered up. Faults can be simple, like having to hit the meter bridge in order to get a light to come on, or more problematic, like the external power supply voltage indicators don't come ready

without a bunch of monkeying around.

Ask the engineer to power up the console and configure it for mixdown. Disable all channel EQs (and dynamics if these exist). Put all faders at their minimum level. Turn the control room volume up pretty loud and listen. Things should be quiet. If you hear any hum at this point, ask the engineer why. Next, put up the main stereo faders and listen. Again things should be quiet. If you hear a hum, check for ground problems by using your multimeter.

Set your multimeter for AC volts and set the scale in the neighborhood of 200 volts. Touch one probe to one of the metal screws on the console chassis and the other probe to the metal face of any rack mount equipment connected to the console's patchbay. Move the probe around to various pieces of equipment. You should measure zero or almost zero volts. If you register 40, 50, or 60 volts, ask if the outboard racks can be physically disconnected from the main power. Your reading should drop, the hum should reduce significantly, and you should be able to continue with your tests. If you still hear a hum and show voltage, ground problems exist. The simple (for you but not necessarily for the seller) solution would be to disconnect the console from everything except a power amp and monitor speakers. If you're adept at measuring voltages, determine what the power supply voltages are.

CHANNEL CHECK OUT

Assuming no ground problems exist, move all the faders up to 0 one by one. Keep the control room volume up and the master faders at +6. As you ride each fader up, notice how they feel — smooth, grabby, tight, loose. Listen for any static as you ride them up (a signal of dirty or worn wipers). And, most important, listen for any dramatic noise level changes. Leave each fader at 0 and listen to the overall noise level. It should not have increased much. Mark noisy modules with a piece of masking tape. Leave all the faders at 0.

Now turn the control room monitor all the way down to silence and power up your tone generator. Ask the engineer to point you in the direction of the tape returns. Pick a tone you can stand to listen to for a little while and inject that signal into the tape return for the #1 channel strip. Slowly turn up the control room volume to a bearable, but definitely not loud, level.

See what the #1 VU meter registers and what the output VU registers. Inject each channel with signal. Go for around 40 Hz when testing faders, switches, and pots, as this frequency tends to bring out the worst in them. Are any louder or softer (listen and look at the VUs). You want consistency. Check the aux returns as well. Mark weak or distorted channels with masking tape.

If there are no serious level differences, ask the engineer to put the console in tracking and monitoring mode. You can now check the mic inputs and

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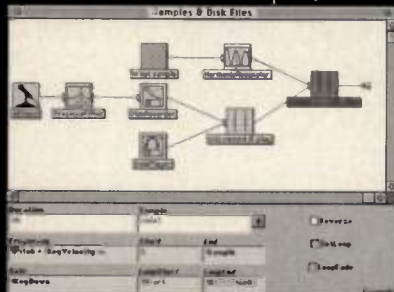
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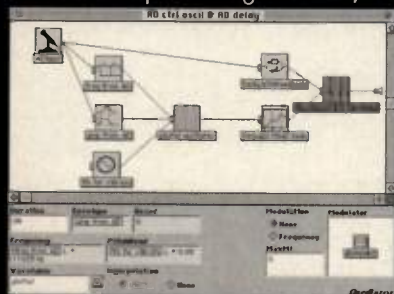
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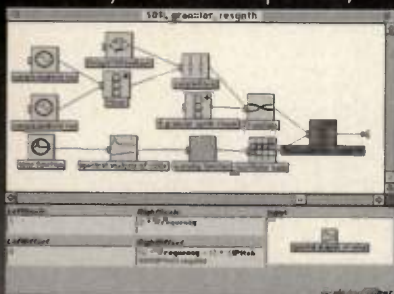
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CIRCLE 77 ON FREE INFO CARD

56 APRIL EQ

TECHNIQUES SHOPPING

phantom power circuits. Remove the battery from the Countryman DI (if it has one), plug the tone generator into the DI box, and plug the mic output of the DI into the mic input of the console's channel 1. Depending upon how the console is wired you may be able to get to the mic inputs, at the console, through a patch-bay, or by going through the studio's mic connectors. Use your own known good cables as much as possible.

Enable the phantom power for all inputs, start the tone, and check all inputs for detail and consistency. Now check your aux sends and cue mix both with headphones and through the control room monitors. On split consoles, listen to the tone on both sides. Mark faulty channel modules with tape.

If things sound good and you get quiet circuits and consistent channel modules, it's time to determine how this board sounds. Put the console back in mix mode, select a channel, and patch in your DAT machine. Begin with your vocal tracks and see how musical the EQ is. Can you thicken the vocals without getting a lot of mud? Can you give them some upper "air"? Can you bring out or reduce any specific vocalists on the harmony vocal tracks? Can you shape the sounds of the kick and snare tracks (hopefully full of other drum-kit bleed for these tests) by reducing some of the bleed? With electric guitar, can you reduce amp hum and yet keep the overall character of the guitar sound? How much surgery can you do before you start losing your main sound? A general rule of thumb: go for EQ that sounds musical. You can always use an outboard parametric for major surgery. Finally, listen to a complete stereo mix in both the 2-track returns and in separate channels with the EQ disabled. They should be pretty close in terms of detail and coloration.

MODS, ROCKERS & REALITY

If things still sound good, power down the console and pull some modules. Make sure to take them randomly from different parts of the board, especially at the ends. (It's not uncommon to put crapped out modules at one side.) Get some good light and look at the circuit boards and switches. Can you find consistency or do some have noticeable differences? Hmm...this I/O module has 8 gray capacitors and this one has 17...Look for repairs, mods, and general quality of workmanship.

Don't forget to open the power supply and look inside. See if it is covered with caked-on dirt. Do you see any brown spots? Such spots could indicate that some component is running on the hot side.

AS FOR RED FLAGS

There are some things over which you should raise an eyebrow. One, for example, is a "Yes" answer to the question, "Has this console ever been modified?" Find out who did the mods, what did they do, do the mods work, and is documentation available. Poorly executed mods can be real time bombs, especially during a move.

Another flag: noisy, scratchy, uneven, or distorted sound. Most of these problems can be attributed to dirty, worn out switches and pots. Good components cost money, and this is often an area where some manufacturers skimp. Even the high-quality controls on those wonderful old APIs and Neves have to be replaced some time. Changing that stuff on a large scale is skilled, nut-busting, expensive work.

Yet another problem is poor ergonomics. Can this console do as many things as your old console? Can you comprehend the signal flow and easily give a separate stereo headphone mix to the talent with effects and EQ, and get a killer control mix going with EQ and effects and send unequalized tracks to tape if you so desire? In other words, is the signal routing flexible? How's the monitoring set up? What's the EQ like? Do you only have a few aux sends? Are you going backwards or forwards with this purchase? If you have a winner, get out the tape measure, make some measurements, and write them down. Use those figures to determine how this board physically fits into your current layout.

If all at last seems copacetic, do yourself a final favor and spend a couple of bucks and call in your main repair person to have a look around. A flawed console choice can mean expense, down time, and major frustration. Following the above procedures will help you make the right decision and, hopefully, negotiate a decent price. Happy hunting.

Bennet Spielvogel, a.k.a. The East Side Flash, owns Flashpoint Recording Studio in Austin, TX. He continues to search for the perfect console.

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Marathon Man

Unsigned bands get their big break as 100 acts are recorded in six days

BY ROY MCDONALD

When Apres Midi studio manager Irene Conrad first told me that I would be recording 100 bands in six days, I thought to myself how nice it would be if I were sucking down frozen margaritas in Playa del Carmen that weekend. Unfortunately, that's not the job of a chief engineer. It was my responsibility to make sure that all of those bands (each with only one hour of studio time) were able to come in, play their instruments, and have a cohesive mix that was blended well enough to go right to DAT and cassette.

Of course, my first question was, "Why would we want to do this?" It seemed kind of silly: Apres Midi is a world-class studio, and this was a bit like some booth at a theme park. You know — where a person gets to sing to a prerecorded track and it usually sounds like hell.

Producer/engineer John Rollo (whose credits include Joe Cocker and The Kinks) was supervising the project, and he believes that there is a lot of worthy talent in New Jersey and neighboring states. John wanted to find the best unsigned artists in the area and felt that this recording marathon would be the way to do it, because hearing and seeing 100 bands would normally take about six months.

The concept works for everybody involved. The bands get the chance to record for free in a studio where rates can be upwards of

\$250 per hour and they get a tape of their recording session. And it works for John because maybe the next Bon Jovi will walk in and he'll get to produce or possibly manage them. It was easy to get the word out that this event was going to happen. John gave a brief interview to the New Jersey Star Ledger and the response was overwhelming. We could have had 250 bands if we wanted. By 3 PM of the day that the interview was printed, the 100 slots were filled.

SNAP JUDGMENTS

It was bestowed upon me to make this thing go down as smoothly as possible, and I first needed a day to prepare. I was able to come up with some ideas for getting the bands up and recording within minutes. All of the bands were required, for the most part, to use the studio's equipment, which would be

set up ahead of time. If a band brought in a keyboard or guitar amp they could possibly use it, but no one was permitted to bring their own drum set.

Every guitar amp was placed in a big stack, each with a mic on it that was numbered and routed to a specific channel in the console. The DIs for bass and keyboard, as well as vocal mics and a bunch of extra mics (set aside for anything you can imagine), were also numbered and routed to specific channels. Here's where the versatility of the Euphonix CS2000 really showed its strength. The CS2000 has snapshot memory that enables you to change its entire configuration at the push of a button. This console has six inputs per channel, which (combined with an intelligent wiring scheme designed by Film-tek Associates of New York), made the recording process very easy.

I thought that the best way to handle all of these different bands was to think up specific recording scenarios and then design console snapshots to accommodate them. My first snapshot was for drums, bass, guitar, and vocal. I had the drums coming up in channels 1-9, and I went through each channel and adjusted the EQ until the kit sounded right. Then when



OVER 100 SERVED: McDonald mans Apres Midi's Euphonix CS2000 console.



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I saved the snapshot, the EQ settings were saved as well. In this snapshot I had also added EQ to the bass (channel 10) with the idea that the bass would always be on a DI. I used a Shure SM57 for guitar (channel 12) and a Neumann U87 for vocal (channel 13). In order to put the drums in a larger space, I used a live-drum room setting (with a 24-meter room) on our Lexicon 300.

All of these elements went into my first snapshot and I called it "three-piece band, large drums." Now when-

ever a three-piece band walked in with guitar, bass, and drums, I pushed one button and all these settings were there. The second snapshot basically emulated the first, except that a smaller reverb would be dialed up on the Lexicon 300. The Euphonix console can talk MIDI, so with one push of a button I could change not only the configuration of the console, but also the configuration of all or part of my outboard gear. The rest of my snapshots consisted of as many different band scenarios

as I could think of: two guitars, bass, and two keyboards; one guitar, one acoustic guitar, bass, and keyboards, and so on. The more I thought of different situations, the more snapshots I created, complete with EQ, compression, gates, and effects. Sometimes I returned the effects to different channels. Since each fader of the CS2000 can have up to six inputs, the input assigned to a fader was predetermined when I designed each snapshot.

HEAD CASES

As far as the headphone cue mixes were concerned, I used the upper fader in the channel path to send the signal (post-lower fader) to the 'phones. If the band wanted to hear an instrument a little bit louder in their 'phones, I could just raise the upper fader without disturbing my control-room mix, which was on the lower faders.

I tried to avoid getting into multiple cue mixes because of the time limitation for each band. I did, however, have one separate cue mix assigned to the lower fader aux send of each snapshot. This way if someone needed to hear something radically different from the rest of the band, I could give them their own mix. Naturally, I never announced this because it would have just added to the madness of the situation. If you have only one hour, you don't want to be messing around with getting everybody the perfect headphone mix — it's better to set it and forget it. In the end, I had around 35 snapshots complete with two headphone cues.

After the first day of recording, I found that certain things just weren't working. I realized that using a U87 on lead vocals was just a bit much, because the U87 has such great presence and picks up just about anything around it. I decided to go for more of a "live" mic for the occasion. A Shure SM58 turned out to be the answer. Using this mic I was able to isolate the lead vocal from the rest of the instruments. I also started to find that placing a couple of AKG C414's in the corners of the room added a certain fullness to the mix, especially when there was a percussion player in the band. Naturally, every time I changed a mic or just the position of something, I would change the sound and my snapshot. So when things sounded right to me again, I would restore the snapshot, which took about two seconds.

continued on page 124

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All That Jaz

Iomega's portable storage drive might make the perfect complement to Roland's DM-800

BY PHIL NICOLO

As you probably know, the Roland DM-800 is a stand-alone digital workstation, 8-track digital recorder, and 8-channel automated console with EQ. The DM-800 has everything you'd expect from a digital workstation, including digital editing (the To, From, and Thru keys give you instant access to the pieces you're editing), time and pitch manipulation, one button wave window, and a variety of crossfade and overlap functions

that help make otherwise difficult edits quite easy. The 8-track recorder is laid out like a tape recorder (Play, FF, REW, etc.) with over 100 takes available per track. The digital console provides automation, digital EQ, and an in/out routing matrix.

The biggest problem with the DM-800, and hard-disk recorders in general, is disk space — there's never enough. Roland realizes this, and that is why it has decided to distribute Iomega's removable Jaz (and Zip) drive to the pro audio marketplace. I recently had the chance to try out one of the first Jaz drives with the DM-800.

DRIVE TIME

For those of you unfamiliar with the



GET JAZZED: Iomega's Jaz gives you 1 GB to go.

Jaz, it is a portable 8- x 1.5- x 5.33-inch drive that has removable 1 GB cartridges. With a seek time of 12 milliseconds, the Jaz drive is fast enough for direct hard-disk recording. The cartridges supply over three hours of recording time on the DM-800 at 44.1 kHz. It's got a minimum sustained transfer rate of 3.8 MB/second; a maximum sustained rate of 6.7



THREE FOR THE ROAD: Phil Nicolo poses with his favorite recording team — Iomega's Jaz drive and Roland's DM-800.

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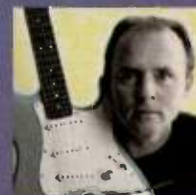
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TECHNIQUES HARD DISK

The Jaz drive is quiet and, just as Iomega claims, fast. No longer do I have to download my hard drives to DAT to change projects — just switch to a different cartridge and you are off.

The Jaz drive was easy to install. I just plugged the drive into the SCSI port on the back of the DM-800. The drive comes with installation software, so booting up was a breeze. Then, I just popped in this sort of fat 3.5-inch floppy, and *voila* — one full gigabyte of memory.

Of course, the most important thing about any storage medium is reliability. The specs from Iomega list MTBF (Mean Time Before Failure) at 250,000 hours; service life at five years; and a bit-error rate of 1 in 10¹². The disk drop height is three feet, and the disk estimated shelf life in its case is ten years. Now I haven't had the Jaz long enough to verify all of these claims, but I have been transferring a lot of stuff on the disks and they haven't failed yet. I'll get back to you in ten years and let you know how they are as a storage medium.

The Jaz drive is quiet and, just as Iomega claims, fast. No longer do I have to download my hard drives to DAT to change projects — just switch to a different cartridge and you are off.

COOL COMBO

The Jaz drive is good for any hard-disk platform, but I have been using it extensively with my DM-800. Working with the DM-800 is great for me, being that I'm not a "mouse" person. Mice are great, don't get me wrong (I do love Mickey, Minnie, and Mighty), but I'm the kind of producer/engineer who would rather push a button. I like tactile controls. The built-in LCD screen gives me all the info I need to work, but if I want, I can just plug in my high res monitor and view all my major parameters at a glance (actually, I'd rather use my monitor to watch reruns of *The Simpsons* while I work).

Now call me old fashioned, but to this old analog head (2-inch tape is my best friend), the most important aspect of a piece of audio gear is the way it sounds. The DM-800 doesn't have that two-dimensional thinness I have associated with many of the digital

recorders I have used. The sound is full and very dimensional. You can hear it on all the records I've produced this year, including *Stomp 442* by Anthrax, *Exit the Dragon* by Uge Overkill, and a new James Hall album that is due out on Geffen sometime soon.

The DM-800 and the Jaz drive are so portable that during production of the Uge Overkill and Anthrax albums I would spend most of my time during the day capturing various performances (vocals, guitars, keys, etc.) on to a Jaz cartridge, and after the band had played enough for one day, they could split over to the pub (which was conveniently located next door) and I would put the DM-800 and Jaz drive under my arm, go home, and sort through different takes, pick through the best ones, and make final choices with the band the next day. I could also make any small tempo or pitch changes if necessary.

The DM-800/Jaz combo also came in very handy on a remix I did of the song "Message in a Bottle" by the Police for their new greatest hits compilation. The only master tape available was a copy of the dbx-encoded original, which had a few dropouts. I used the DM-800 to restore the dropouts (some less than 1 second long) by finding the same sound in another part of the song, copying it, and trimming it over the dropout. I then used the A/Ds in the DM-800 for the final mix.

I have found the DM-800 to be one of the most versatile and best sounding digital production tools ever. Teamed up with the Iomega's Jaz drive, the combination is unbeatable.

For more information, contact Roland, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: 213-685-5141. Circle EQ free lit. #121.

Phil Nicolo is owner, producer, and engineer at Studio 4 Recording in Conshohocken, PA. He has worked with a variety of clients including the Rolling Stones, Sting, Amy Grant, and Aerosmith.



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CIRCLE 78 ON FREE INFO CARD

**LOU REED
ACHIEVES HIS
DREAM OF
HAVING
A RECORDING
SOUND EXACTLY
THE WAY
HE PLAYED IT**

BY BOB LUDWIG

have known Lou Reed since I consulted in mastering his *Metal Machine Music* album in 4-channel discrete quadraphonic. Lou has always been very interested in faithfully capturing his true sound on record, including experiments in binaural recording. Like most artists, he has found this to be a very difficult thing to truly do.

Since then, I have worked with Lou on three other albums: *New York City*, *Magic and Loss*, and his latest

release *Set the Twilight Reeling*. With *New York City* and *Magic and Loss*, Lou was still not satisfied that the sounds he heard in the studio were still not being captured on tape. With *Set the Twilight Reeling*, Lou finally captured 100 percent of his vision. This article is about how he captured that vision.

This interview took place at Lou's New York City apartment shortly after completing the mastering of the record up at my place in Portland, Maine. Steve Rosenthal, the engineer on Lou's record joined us.



Bob Ludwig: Let's talk about the record. I was going to ask you about the sequence because I remember what trouble you had doing it.

Lou Reed: I told everybody involved in the recording to make out a sequence, which we did, and they were really pretty similar. That is really interesting. And I would just sit here with the CDs we made up and make different versions of it and listen to the end of one song going into the beginning of the next. And some songs would be *destroyed* by being in the wrong place. And then other ones, like "Hang On to

Your Emotions" going into "Sex With Your Parents" seemed destined.

Bob: It's as though there's some omnipotent thing looking down on this sequence!

Lou: We cut "Sex With Your Parents" on July 4th, but at the time I don't think we knew the date. We were ensconced up here in the studio I made in my apartment, so who knew what day it was.

[Lou shows me some of the gear involved in making the record and the list of guitars used on each track.]

We found this direct box from

Avalon for the bass, the DI-U5. It costs \$600 bucks, but they could charge \$10,000 and it would be a bargain. We found an SVT [Ampeg bass amp] setting where you would swear you were listening to an SVT. We would mic a little Hartke bass amp with an old solid state Neumann, I forget the model, and there would be your bass. And then Fernando Saunders [bass player] could monitor it through the ATCs you introduced me to. Everything went through the ATC SCA-50's (available through HHB), god bless them.

True Lou



Photos by Beth Groubert

True Lou



Bob: Do you own all these mics?

Lou: Yeah. We rented the bass mic for half the session, but then I put an order in and they found me one. All the guitar mics, all the vocal mics that's all me. The only thing we rented as far as other mics goes was the Schoeps Stereo Sphere. The rest is from Roof Recording Services' small but extensive collection.

I think one of the big secrets was the Manley Reference Gold tube microphone that was always used as the vocal mic, but you could use it for anything. The leakage into it always sounded great. It wasn't like, "Oh, the leakage is horrible." On my vocal track you can hear the electric drums Tony "Thunder" Smith [drummer] is playing, and you can hear him hitting the pads. The guitar is also raging through the vocal.

Bob: How did you have the guitars lined up?

Lou: We had from two to seven guitar mics set up. That's why we didn't have a lot of instruments, but we made a lot

microphones would get a great guitar sound on its own, but it's the combination that gets that sound on tape like what I heard live. I said I was never going to release another record unless it sounded like what I heard when I made it.

When we moved down to the Magic Shop [also in Manhattan], we brought in all the big rigs that we couldn't use in my project studio. At my place, there was not one square inch you could move. Fernando was playing opposite me; we were playing staring at each other.

It was a tight space. We had it all baffled off with eight bath mats. They were like little houses for the amps.

[Steve Rosenthal, engineer and owner of the Magic Shop, arrives.]

Bob: Steve, had you used those Coles mics before?

Steve: I'd used ribbon mics for horns before, but never for guitars.

Bob: How do these Coles compare to, say, an RCA ribbon mic?

Steve: They're more accurate, they

Lou: This is one of the world's foremost Beatles fans, by the way.

Steve: Drummer Tony "Thunder" Smith was sitting on a special platform Lou had built for him.

Lou: It was made of plywood, but it was filled with this stuff from Ultra-sonic up in Maine. What we had noticed, and tried to continue at the Magic Shop, was that we had the ability to get the exact guitar sound I always wanted by using that acoustic sound stuff with Seisel carpet on top of that for absorption (it's Seisel because wool would give you static shock). So we did the same thing at the Magic Shop.

My studio was a nightmare live room because if you snapped your fingers, the sound would go on for eight seconds. At the Magic Shop, we measured out a portion of the studio, covered it with the same soundproofing treatment we used at home, and put a Seisel carpet over it. So the amps are sitting on this stuff, and you're not getting that hard bounce-off. Do you still use that at the studio?

Steve: Yeah, it's still sitting on the drum platform.

Lou: We had tried a couple of things. At home, we are always listening through speakers aimed directly at us. But when we tried to do this at the Magic Shop, it didn't work because the room was so live, and not meant for listening to music like that. The control room, however, was a different story. I went into the control room with a pair of Aerial speakers, which were set up in the back of the room. There is a sweet spot on the couch, and that's where I had my guitar controls, which were linked out into the studio. I was sitting in between those big Aerials there — and added a set of ATCs at the front! We mixed through six systems. Starting with the little mono speaker built into the Neve, to the ATCs, to the Colberts, to my Cambridge portable system, and to my custom-made Richard Rose Tannoys.

Steve: The headphones! Tell him about the cool headphones system!

Lou: Oh yeah, we had eight pairs of Grado Prestiges, some Sennheiser headphones, and my Sony 999's. Everybody fell in love with the little Grado headphones. They are such fun.



MAGIC MAN: Reed shows some muscle at the Magic Shop.

of tracks. That's also why we had to mix in a place that had automation with moving faders. There were so many tracks used to make up this sound. Between the drums and the guitars we were at 24 tracks, and we hadn't even done anything yet! That was the kind of attention we were paying to the guitars. Any one of those

color the sound less, and they can take a higher sound pressure level. In the old days, they used to be used as drum overhead mics. That's originally where I saw them; they were in that Beatles recording session book. There's one sitting on top of Ringo's drum kit. So they can take high sound pressure levels.

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ALESIS

True Lou



Steve: Not really expensive but very accurate.

Bob: How was the band set up?

Steve: The drums were back on a platform, and Lou was kinda mobile — it depended on how close he wanted to be to his amp. Or how close, in effect, I could have him be to his amp. Sometimes, when we had these big hairy sounds, we had to get the Manley away from the guitar amps. Everything was in a pretty confined area.

Bob: The Manley has switchable patterns?

Steve: Yes, and Lou has a custom-made Manley.

Lou: They shaped the bottom end for me. Made it work with my voice better. I called David Manley up and said the mic does this and this and this, but for me it does that and that. He said, "I know just what you mean, I can do it in ten minutes" — and he did! And it came back and it's this amazing microphone. The beauty of

that mic is that all the other things going through it sounded good.

Steve: It was almost like having a room mic in a way, because it's so accurate. And it was picking up everything that was going on up here. If we had a mic that was coloring what was going on [the off-axis sounds], we wouldn't have gotten the tones that we got. This mic is so dead-on accurate that it really reproduces the tones that you give it. It's a big part of why the record sounds the way it does.

LOU ON LYRICS

Bob Ludwig: Were these songs written over a long period of time?

Lou Reed: These songs all came in one shot pretty much after I had the production elements under control and I could just concentrate on writing and not have anything else interfere with it. They came fairly quickly over a period of two to three weeks.

Do you remember which was the first song of the group that you wrote?

Actually that's easy, it was "Egg Cream." It was written for a movie, and I really fell in love with the song. Because I was in "writing" mode, if anyone wanted a song for a film I'd say, "Yeah, but I have to be able to use the song on an album. This happened with the TV show *Friends*. I did a song called "You'll Know When You Were Loved," which I didn't keep on the album. It seemed like this album was going to be a collection of songs from various projects, and I didn't want that.

I know that "HookyWooky" came early. I think I was in Europe at the time, I was doing this TV show called *The White Room*, and for some odd reason I found myself, apropos of absolutely nothing, suddenly saying, "Let's do the hooky-wooky!" I love to hooky wooky! I hear these things in my head now and then, and this went on to such a degree I said I've got to write a song. So I came back and wrote this song and it took this odd-turn during the lyric. Hard left! That was one of the earlier ones. "Finish Line" was one of the last ones.

Did the press say anything to you about "Sex With Your Parents"?

They say things I don't know what they mean like, "Are you worried that you'll get in trouble?" Like this is an Eastern Bloc Nation.

They ask, "Is the label giving you a problem?" I said no, nothing like that. And I say, "Don't you think it's really funny?" Then they seem relieved that I say it's funny. I don't for a second expect to change anybody's mind about anything, I'm just making a joke because I hate those people. So it is getting noticed.

"Finish Line" was written in the studio 'cause it had been

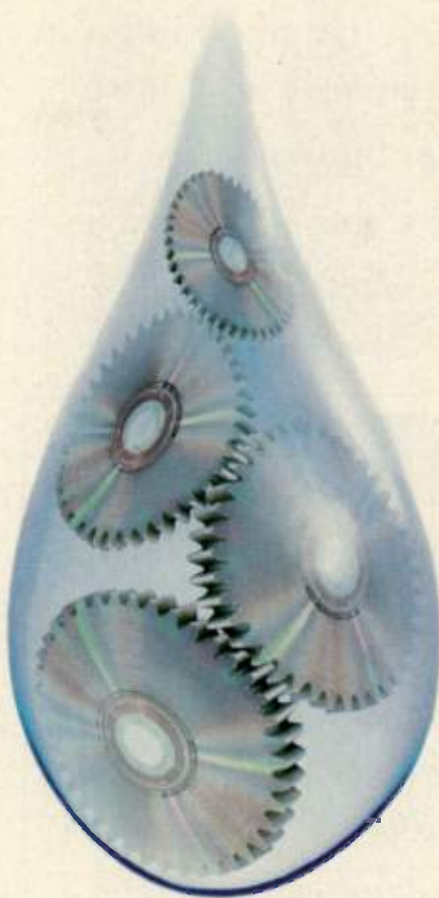
something else, and the something else it was did not make it. I loved this little basic track we had, but I couldn't dislodge the old song. It was very difficult to rewrite, and then Laurie Anderson kind of jump-started me. She said, "Remember you've got this lyric in your computer?" And I said, "I do?" I went in there and started rewriting that and 'lo and behold it gained a life force as strong as the other one and was able to dislodge it because it was better. The only thing that remained of the original track was Fernando's bass. In fact, when Roy Bittan overdubbed his piano part it was to the other song! He's never heard the song the way it actually is!

I hear about these serendipitous things happening when artists write songs, and it amazes me. It's beyond my understanding.

It's almost like taking dictation. I don't know what to make of it at all. I can't even imagine how that gets done, and then you do another one! It makes me think that you're able to get in touch with another section of your mind that is really very much in touch with your soul on a level that's different from everyday experience. Sometimes there'll be words there that I don't know or a spelling that I think is wrong and I'll go check and the spelling is not wrong, and the word is not wrong. It's just a word that I'm not really acquainted with! I don't know what to make of that!

In "Set the Twilight Reeling," the word "borne" is spelled with an "e" at the end. I'm doing this proofreading later and I thought, "I don't make mistakes like that." So I went to the dictionary and looked up borne with an "e." Borne with an "e" means "to carry." The other born, of course, means to give birth. I kept looking for who put the "e" there. Some part of my brain no doubt remembers this fact from some English class. I wouldn't normally use that word in normal conversation, it's really a word for writing. It's not even archaic.

Without getting new-agey, I don't think when you look at a beautiful painting it does the same thing that music does. A record actually physically moves you. Today, in rehearsal, we hit this power chord together, and you could feel your solar plexus go "oh, man!" The bass kicks in and you go "whoa!" and then when you put words to that and get your head involved, that's really great.



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CIRCLE 82 ON FREE INFO CARD

True Lou



We had a lot of fun because we were trying to avoid EQ'ing. I knew if we got the right sounds matching we would not have to worry about EQ'ing.

The way the drums were set up was really fascinating. It was done with an electronic drum set hooked up to an Akai S-3000 sampler. Struan Oglanby [production coordinator and programmer] and I spent a couple of days in the Magic Shop sampling drums; including some favorite kits that we like, some really old snares, old kick drums from the late '20s, and a giant parade kick drum. How many sets of drums would you say we had there?

Lou: They brought in four or five bass drums and about four snares. But Steve let us use his drum room so that we could get this great live sound on the drums, and we just went through all kits that we like. He has *his* favorite, I had *my* favorite, and then we'd bring the samples here. You didn't have to put an effect on them because they were done in a live room in the first place. It was like a classic sound right off the bat. We had a bunch of them!

Steve: Struan would do the programming, and he could combine sounds. Lou might say, "I like this kick drum sound; it's really fat, but I wish it had a little more attack." Struan could slip another kick sample in there and get it to where Lou liked it, and all of a sudden we had a very unique kick-drum sound. They were both live kick drums, but we were able to manipulate it through the sampler in a way we could have never done in a live situation where the cymbals were clashing and everyone was banging and slamming. There was a lot of control, which was really important.

We were thinking in the beginning of putting a live hi-hat in here and having some of the drums live. We brought one up one day, hit it once, and everybody went "No!" It would have been impossible. Tony Smith came up and saved our collective lives because he knew how to play this stuff. A regular drummer cannot just sit down and play it — it's not gonna happen.

Lou: I figured out I spent about two-and-a-half years preparing for this in the sense of gearing up, which included A/B-ing equipment and calling people up. I called people I trust, obviously including you, Bob, and I'd ask what is your mic of



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choice, what's your "this" of choice, and we would go out and give it a listen. People were very helpful. Guys would actually lend us their favorite thing to check it out.

Steve: I came on board about a year before we started recording, when I started coming up to Lou's place. We would have a great time, too. We would sit here with really high quality pieces of equipment and just go, "Do you like that? How about this? What sounds good? What doesn't sound good?" We did that for microphones, we did that for equalizers, we did that for compressors — we just went through the whole recording chain.

Lou: We would do blindfold tests for each other. And, almost without exception, we would pick out the same thing. Some of the answers were a little shocking; a lot of times the answer wasn't what you'd think it

Steve: I was very surprised. We are not really digital reverb fans by any stretch, so we were excited about having this EMT plate here. But as soon as we closed our eyes and listened, it was a revelation. What Sony has done was take all of the good features of the Gold Foil and got rid of all that junk that we'd have to spend two hours in the studio trying to filter out. The poor guy had to take his box back — he thought he had a two-month rental!

Lou: It's like that Avalon bass direct box, which has a little button with a high-end filter on it...

Steve: When you take the DI (Direct Insert) into the studio there is this high-frequency junk that sits on the top of the bass sound and usually when you try to get rid of it you get rid of some of the bass tone, the high harmonics. Wynton Morro at Avalon is really an amazing character. He was a

Lou: \$349 bucks. It's got a little contour button that, according to Hartke, is the Motown [bass instrument] EQ.

Bob: Un huh [laughs sarcastically, knowing something of what actually did go into making the Motown bass sound].

Lou: So the button was always in [everyone laughs], and then Fernando would shape it after that. And then we found our SVT setting with the Avalon. There's a whole bunch of other settings, too. You just do it with a click.

Steve: They were all very useful. Lou's got EQ, a tone control, and a boost. We used an awful lot of Avalon equipment on the record.

Lou: Steve thought so much of the Hartke bass amp that he got one for the studio.

Steve: Yeah, I bought one for the Magic Shop, too. I've got a [Ampeg] B-15, but I didn't have any modern amp that I thought was really great, but as soon as I heard this thing I thought, "I want one of these." People have been using it at the studio. You don't have to play at loud levels to get a really punchy tone. Sometimes with bass amps you have to put the thing up to 150 to get some sort of tone out of it.

So the bass was a combination of the Hartke systems and the Avalon DI through Neve preamps. Lou had gotten a rack of 3-band Neve preamps that we used on the album per our A/B testing. And one of them was used for the bass.

Bob: When you were doing this A/B testing, there are a zillion permutations one can go through, did you get into changing cables and interconnects and stuff like that?

Lou: No, we stuck to what was here.

Steve: We used regular standard cabling.

Lou: We had already gone through the Kimber Cable and Monster Cable trips, but that stuff was for guitars. All we discovered, for whatever it's worth, was that we introduced tones that you wouldn't want to hear. You did get more, but it was something you'd want to take out if it was there. The Kimber and Monster cables were only hooked up to the monitors.

I am using special cords for my guitars. The cable from my guitar and all of the amps was specially made for me by Pete Cornish in London. I've



CROWD CONTROL: Lou's New York City studio/apartment was a tight squeeze at times.

would be, which was the beauty of the blindfold test. For example, Steve knew a guy who had an original EMT Gold Foil. One day we had it lugged up here...

Steve: It weighs 400 lbs...

Bob: Thank God it wasn't the steel plate!

Lou: And he compared it to the Sony "Gold Foil" program on the R7. Blindfold test again, guess what? The Sony was way better! The schmootz wasn't there.

musician and thinks about his equipment in a musical way. He put a low-pass filter into the DI that basically removes the high-frequency junk and it does not change the harmonics of the bass.

Lou: Steve went crazy when he heard it. He said, "My god, whoever built this really knows his stuff."

Steve: That's such a nightmare, DIs and stuff. Lou had found this great Hartke Systems bass amp that we used an awful lot on the album



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got no idea what's going on, but one end of the cable *has* to be connected to the amp, and the other end *has* to be attached to the guitar.

I've got a bunch of varying lengths that Pete has made for me, and all I know is it really sounds great. I've tried other guys' cables where they say they're doing something, and they sound mid-rangey and weird and thin. You know they say they get more, but the only thing they do that I notice is lose bottom. Then I had these special guitars made by John Bolan with the design by Ned Steinberger — that was my last move. And these special Telecasters by Rick Kelly that all have hundred-year-old necks.

Joe Bardon, who built the pickups in there, said, "If this was stock-car racing, having a 100-year-old neck is like having nitro in back of you — it's not even fair to anybody else!" I mean, there's old Telecasters, but this is from Stradivarius's time!

Bob: Just as an aside, is Lou's studio hum prone?

Steve: Actually it's very [RF] quiet in here.

Lou: As long as I don't put on any of the lights that have dimmers.

Steve: You couldn't have dimmers, which is a regular studio rule — so in that sense the rule followed the rule.

Bob: There's not a transmitting tower near here?

Steve: There was no RF, but we had birds flying into the window.

Lou: We had birds crashing — attracted by the sound! But we've been playing up here since I've been living here, and I knew there wasn't any of *that* kind of hum. But when we were getting ready to record, Steve was gracious enough to help me set it up and he brought in his assistant Joe Worda. Worda brought in a guy to wire all of this stuff and we were all looking for hum.

Bob: Let's talk more about guitars...

Steve: There was an incredible guitar forest here. There were so many guitars to choose from it was just amazing. And each one of the guitars really does a special thing. If there was a particular tonal color that was needed, you'd just pick one up and there it was.

Lou: When I figured that out, it solved one of the greatest problems

I've had in the studio: Even from hour to hour you can't necessarily depend on going back to an amplifier with the same exact guitar, the same settings, the same everything. You do the same thing you did before, only now it doesn't sound good. *Everything's the same, nothing's changed!* But you go back and you can't get that sound back. So we suddenly realized we had a lot of choices we could play with.

Steve: It's really true because you can't repeat this stuff — I don't care what anybody says. We would try a couple of times and then it would be totally different. There were forces beyond our control, so we would just go on...

There were so many
tracks used to make
up this sound.
Between the drums
and the guitars we
were at 24 tracks,
and we hadn't even
done anything yet!

Lou: We had a lot of fun because we were trying to avoid EQ'ing. I knew if we got the right sounds matching we would not have to worry about EQ'ing. We could just place things and they ought to be able to sit right, which is essentially what we did — we spent time placing things.

Bob: This record's got so much space in it. That's the thing that's so impressive to me; it's a rock record with space. I mean, I think the 100-year-old guitar necks come across on the album!

Steve: Yes, it's not filled up with a bunch of overdubs.

Bob: Was the original version of "Egg Cream" the first thing you recorded?

Lou: Yes.

Bob: So it was almost like a demo for the record.

Lou: That *was* the demo for the record. It was what we could really do. And from that song we saw that if you can get some really good people in here, this thing's a real go.

Bob: I'll never forget when you called me up and said, "I captured on tape the way my guitar sounds for the first time!"

Lou: Yeah, it can be done.

Steve: One thing about recording it up here was that you could record it and then immediately play it back through the ATCs.

Lou: Instant feedback!

Steve: So you didn't have to walk into the control room. It wasn't as if Lou and I were separated, we were a half a foot from each other. It was like instant communication because we'd play it live, then play it through the ATC, and he would go, "There's something missing..." and then we would figure it out.

Lou: Steve didn't have to get up out of the control room and walk in. We're sitting right there practically cheek to jowl!

Steve: Yes, and that's a very different thing to do. That's one of the things about recording up here in Lou's studio that was very different, which I think facilitated getting those kind of tones. Usually the artist and the engineer hear two different things. The artist is in the room hearing his guitar amplifier and all the body around it and the room tone, and the engineer is listening to a set of speakers. So, in a sense, they're not even hearing the same thing. But in this particular case we actually heard the same thing. So we could make sure that what was on tape was what we were hearing next to us.

Bob: Steve, since these sessions, how has it been for you back at your studio?

Steve: I've been using the Cambridge a lot. I bring the Cambridge Soundworks in when I do mixes and stuff.

Lou: The Cambridge Soundworks system is by Henry Kloss up in Boston. It comes in a little suitcase. Inside the suitcase is the amplifier, two bookshelf speakers, and cables. The suitcase is a subwoofer. We brought one right into the studio, and it's amazing to go back and fourth between the

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speakers because I found them to relate perfectly with the ATCs.

Things were essentially geared off my Tannoys, and the Tannoys went well with the ATCs. The Tannoys have also gone well with the Colberts. So there's this line through all the speakers. I've been listening and listening to everything that people recommend to me and in the end the Colberts related to the Tannoys, the Tannoys related fine to the ATCs, the ATC's related fine to the Cambridge, the Cambridge related fine to the Aerials — if you heard something on one, it wasn't a mystery on another.

Bob: So there are no NS-10s on this record?

Steve: No NS-10's! I have a pair of Genelecs at the Magic Shop, and when we were overdubbing and mixing we sometimes used the Genelecs, but we bailed on them pretty quickly. Lou got the Aerials brought in from his office and we got another pair of ATCs to put in on top of the console, so there are no NS-10's on this record.

Bob: So you must have done some EQ'ing when you were mixing or recording at the Magic Shop?

Steve: I have to tell you that basically what was EQ'd was the kick drum and the bass (which was EQ'd a little bit on the Neve preamps). Just +1 at 10k on his vocal on the Neve preamp. There is a little bit of EQ through the Sontec on the kick drum, but that's basically all.

Bob: So you didn't record through the Mackie at all?

Steve: No, the Mackie was what I would call our monitoring console. We had Avalon preamps and Lou has eight Hardy preamps. So between the Hardys, the Avalons, and the Neve, that was what we used to record everything to the multitrack.

While nothing was actually recorded through the Mackie, I have to say this about it: One day during our A/B tests, we had all four of the preamps (the Avalon, the Neve, the Hardy, and the Mackie), and we ran a bunch of blindfold tests. And while the Mackie was always last, I have to say that it wasn't last in some cases by that much. We were impressed, especially considering that you get 32 of them [preamps] for basically the cost of one Avalon preamp.

Bob: What was the maximum number

of tracks you ended up using when you were mixing?

Lou: Fifty-six.

Bob: So you owned seven TASCAM DA-88's and you needed to still rent another?

Lou: Yes.

Bob: Just one thing about the vocal: I know that there's almost no sibilance problem on this album, is that just the Manley mic?

Steve: I think there's a combination of elements. We are using the Manley mic, the 3-band Neve mic pre, and an LA-2A tube compressor. And I think the tube compressor has a tendency to do nice

For me the goal was:
"How can I hear it
the way I really like
to hear it and not be
so disassociated
from it?"

things to the top end. I also think the combination of those elements gave us a really nice, bright, accurate vocal sound. But we didn't do any de-essing when we mixed, there was no de-essing done.

Bob: Yes, there wasn't a problem with it. Usually, on past recordings, even with that fantastic Sony vocal mic there would be some sibilance stuff.

Lou: Yeah there was that problem.

Steve: Talk about A/Bing, we spent about a week and a half trying to get the perfect vocal sound. I mean we tried every combination of elements we could get right now. And what we ended up with is the classic sound of the old Neve and the LA-2A. It's the most accurate thing we could get to what it sounds like to have Lou sitting in the room singing. All the other combos would be coloring it, some would bring sibilance, some would make it thinner, some would make it fatter, but this actually sounds like Lou!

Bob: What a concept!

Steve: What a concept to have the artist actually sound the way he sounds! But that brings up another point of exceptional things about this record: I think it is so great and I felt it was really important that Lou plays and sings at the same time. You see the size of this room, you would say that was impossible, how could he sing live in this room with everybody playing at the same time? But it happened.

Bob: What mic pattern did you end up using, super-cardioid?

Steve: No straight cardioid

Lou: It was mic positioning...

Steve: When it was the clean stuff, he could literally be sitting next to his amplifier, which is very liberating I'm sure. Again, when you are performing in the studio there is a sense of disconnection, you're in the isolation booth with your headphones on, your guitar amplifier's 50 feet away, and there's all that dislocation. But I mean here is Lou and here is Lou's guitar amplifier three feet away from him.

Lou: Plus, you were with the guys! You're all in it together and you're performing and you want it to happen and everybody's rocking. The music is pounding right up your back, but up to a controllable level.

It was, in a sense, a dream come true, it was the optimal situation. Hearing it just the way you want it, the amount that you want it, playing with the people that you want, in a completely controlled but really cool situation.

For me the goal was: "How can I hear it the way I really like to hear it and not be so disassociated from it?" I've always felt like I'm just a ghost, a little bit removed and not really there. And you're always trying to conquer that. If you didn't have to conquer that, you could just play. A recording should be something that captures the spirit, not a construct at the board. This is what we heard, this is what we want you to hear. It is what we heard.

Steve: The bass amp would be going while Lou was singing, and sometimes you would hear these really cool percussion parts on the record...

Lou: ...and they are on the vocal mic!

Steve: It's the vocal mic's ambience.

Lou: It's Fernando or it's Tony. The

continued on page 123

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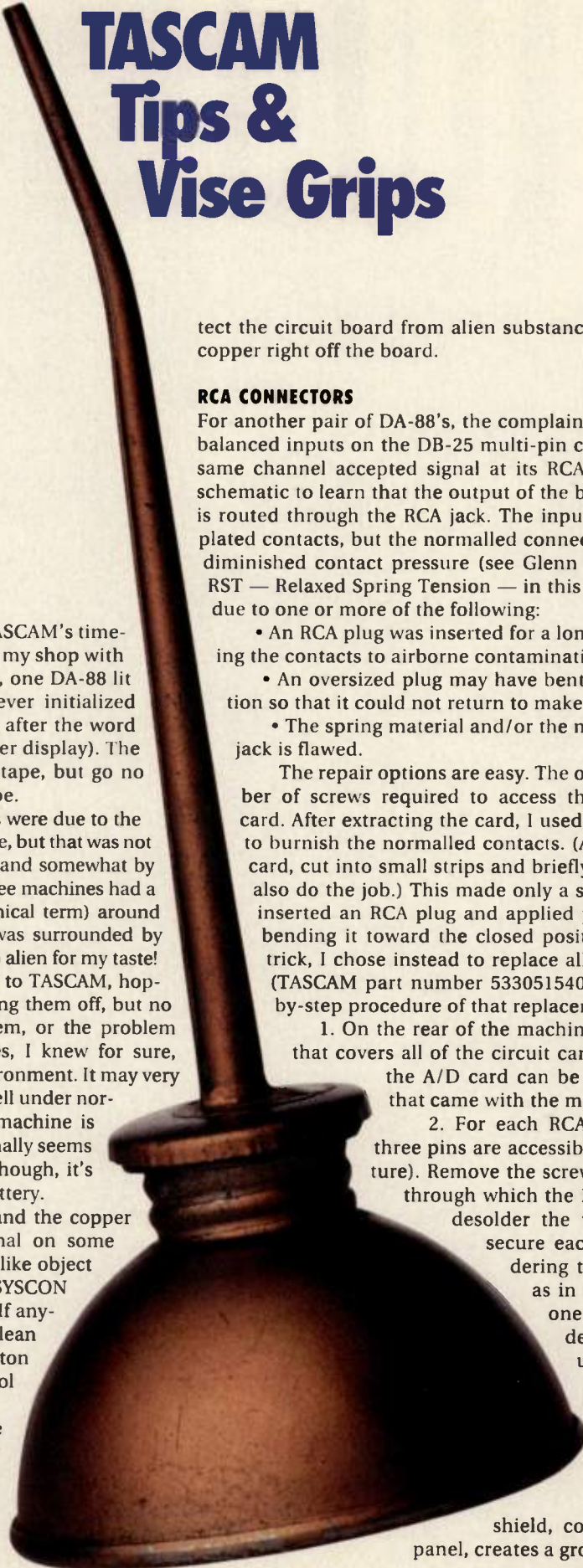


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TASCAM Tips & Vise Grips



Techniques on taking care of the popular digital multitrack

BY EDDIE CILETTI

A pair of DA-88's and DA-60's (TASCAM's time-code DAT deck) recently came to my shop with unusual problems. On power-up, one DA-88 lit up like a Christmas tree but never initialized (the completion of which occurs after the word "TASCAM" scrolls across the meter display). The DA-60 would accept and load a tape, but go no further. It would not eject the tape.

At first I thought the problems were due to the careless installation of new firmware, but that was not the case. After close inspection — and somewhat by accident — I discovered that all three machines had a bit of crusty green schmutz (technical term) around the backup battery. One battery was surrounded by wisps of crystalline hairs — way too alien for my taste!

I immediately got on the line to TASCAM, hoping to score a few points for tipping them off, but no one seemed aware of this problem, or the problem isn't widespread. These machines, I knew for sure, came from a hot temperature environment. It may very well be that the battery behaves well under normal thermal conditions. If your machine is over two years old and/or occasionally seems a taco short of a combo platter, though, it's worth your while to inspect the battery.

Remove both the top cover and the copper chassis plate underneath (optional on some machines). Look for a shiny, coin-like object centered on the left side of the SYSCON PCB (the top-most circuit board). If anything seems foreign in this area, clean it up with an alcohol-soaked cotton swab (or two). Wait for the alcohol to dry before powering back up.

I've been adding a little insurance to this procedure by installing a piece of Fish Paper (MCM part number 21-1125) under the battery plus a wire tie to hold it in place. This will pro-

tect the circuit board from alien substances capable of eating the copper right off the board.

RCA CONNECTORS

For another pair of DA-88's, the complaint was simple: one of the balanced inputs on the DB-25 multi-pin connector was dead. The same channel accepted signal at its RCA jack, so I checked the schematic to learn that the output of the balanced-input amplifier is routed through the RCA jack. The input connectors have gold-plated contacts, but the normalled connection was suffering from diminished contact pressure (see Glenn Coleman's reference to RST — Relaxed Spring Tension — in this issue) which is possibly due to one or more of the following:

- An RCA plug was inserted for a long period of time, exposing the contacts to airborne contamination.
- An oversized plug may have bent the normalled connection so that it could not return to make contact.
- The spring material and/or the mechanical design of the jack is flawed.

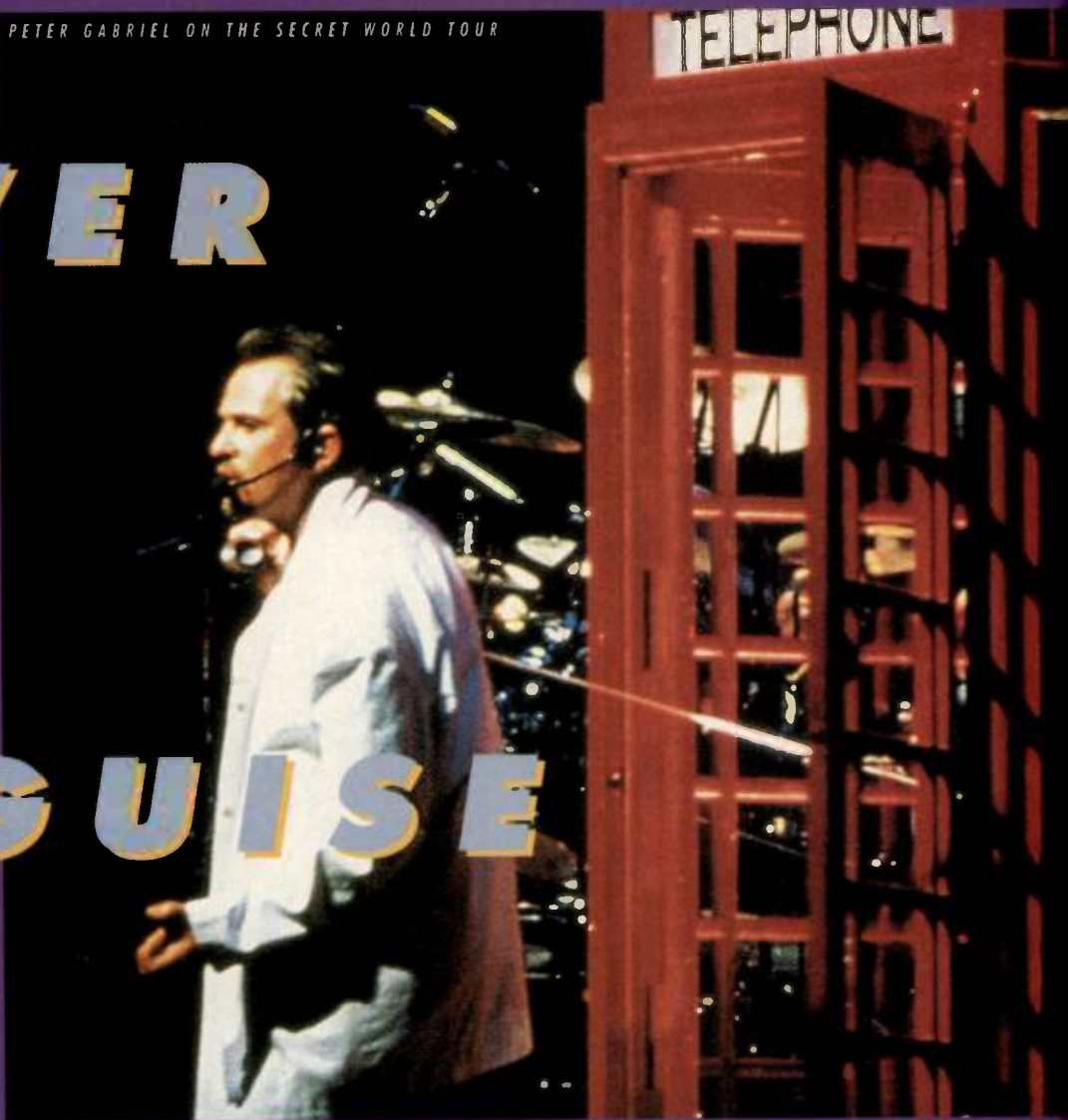
The repair options are easy. The only obstacle is the number of screws required to access the Analog Input/A-to-D card. After extracting the card, I used a very fine lapping film to burnish the normalled contacts. (A coarse-finish business card, cut into small strips and briefly soaked in alcohol, will also do the job.) This made only a slight improvement, so I inserted an RCA plug and applied pressure to the normal, bending it toward the closed position. While this did the trick, I chose instead to replace all four of the connectors (TASCAM part number 5330515400). Following is a step-by-step procedure of that replacement, with pictures!

1. On the rear of the machine is a black metal plate that covers all of the circuit cards. Once it is removed, the A/D card can be extracted (use the tool that came with the machine).

2. For each RCA jack, only two of the three pins are accessible (as shown in the picture). Remove the screws that secure the plate through which the RCA jacks protrude and desolder the three connections that secure each jack. That's a desoldering tool in the picture, but, as in last month's column, a one-tenth inch wide desoldering braid can also be used. These come in 5.5-, 10-, 50-, and 100-foot lengths. (Ten feet of Chem-Wick Lite, MCM part number 21-2190, is \$6.)

Note: The thin copper shield, combined with the back panel, creates a ground plane. Any ground

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potential problems (from the external wiring) are routed directly to the chassis (rather than through the PCB wiring) so that the internal ground will not be contaminated.

3. When soldering in the new jacks, be sure to apply heat to one side of the connector terminal while applying solder to the opposite side. The terminal must be hot enough to melt solder on its own to guarantee a good connection.

4. Fig. 1 shows a rear-view close-up of the RCA connector assembly. The jack on the left shows a closed normal (no plug inserted), while the jack on the right shows an open normal. Professional patchbays have far more contact pressure than these RCA jacks, but even so, it is a good idea not to leave patch cords in the bay for extended periods of time.

5. When the job has been completed, stand the board up on end and brush denatured or anhydrous alcohol on the newly soldered area to remove the flux. Inspect your connections with a magnifier.

DIGITAL COPIES

Also on the request list, both from an *EQ* reader and a client, was a more affordable alternative to TASCAM's digital interface cable (Model PW-88D, part number 5350515400). Honestly,

to make this wire harness in the traditional way (with individual shielded cables for each signal, soldered to a DB-25 connector) TASCAM's price is justified. But a tip from Chris Wright at Soundscape Digital Technology (manufacturers of the SSHDR1 hard-disk recorder) and a close look at the schematic tipped me off to an economical "test" solution.

Attention hardware hackers: TASCAM uses a custom-made, low-capacitance, shielded, twisted-pair cable. Digital equipment generates — and can be the recipient of — interference (hence the FCC label on most gear regarding compliance with same). While figs. 2–4 indicate the use of a generic flat-ribbon cable, either of the following is recommended: A shielded, 25-conductor flat version (part number: MC25R-X-ND) or an unshielded 26-conductor twisted-pair version (part number: MC26F-X-ND). Both are available from DigiKey (800-DIGI-KEY), as is the connector (part number CMM25G-ND). Approximate material cost: \$25 to \$35.

This next group of pictures shows the step-by-step procedure.

1. An IDC-style DB-25 connector that uses a technique known as "insulation displacement" to make solderless connections to a ribbon cable (fig. 2). Note the ridges across the top to keep the cable aligned.

2. There are special ribbon cable tools, but in this case, I chose a standard vise (one of my many...). The cable came from Radio Shack. The stripe marks every fifth conductor. Keeping track of Pin 1 is most important (fig. 3).

3. Fig. 4 brings a schematic face-to-face with reality as well as demonstrating the special "twist" to this story. Note that Pin 1 and Pin 13 are labeled "D out 1" and "D in 1," respectively. That they happen to be at opposite ends of the connector is no accident. Since inputs and outputs are on the same connector, simply flipping the ribbon at one end makes it possible to cross-connect four digital signals (each carries a L/R, odd/even pair), clock (LRCK), emphasis (EMPH), and two sample-rate (Fs) data lines. You have just witnessed a digital handshake.

My thanks to Professor Paul Kozel at the City College of New York (CCNY) for beta-testing the cable under real-world conditions.

FINALE

Recently, while dropping off a very well-used DA-30 DAT deck for service, a client asked why the older of his two DA-88's required more frequent use of the cleaning tape. I just happened to have a pair of machines



FIGURE 1



FIGURE 2



FIGURE 3

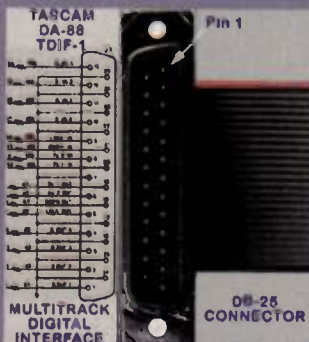


FIGURE 4



FIGURE 5



FIGURE 6

open on the bench and pointed out that newer machines have a cleaning mechanism installed. This was mentioned in January '96's maintenance column, and is shown here for users who chose to manually clean their heads. Fig. 5 is "without" and fig. 6 is "with."

An improved head assembly will also reduce the number of cleanings required, but this is a expensive option that can be done if and when the original head expires.

It is good practice to become familiar with the art of head cleaning. Use a lint-free cloth such as CHEMTRONICS Twillwipes. These

come in packs cut 6 inches x 6 inches (I cut mine into smaller two-inch swatches), and are available from Audio Techniques (212-586-5989). Apply alcohol to the cloth, place the cloth against the head drum with a finger, and gently rotate the head. *Viola!* You have turned heads without showing any leg!

Pictures for all steps are available in the EQ OnLine section of Craig Anderton's Sound, Studio, and Stage area (keyword SSS) on America OnLine. Send e-mail to Eddie Ciletti at eddieaudio@aol.com.

AND NOW A WORD FROM OUR SPONSORS, PT. 1

Q: What is the recommended number of hours of use for a touring speaker? How long should a speaker last before it needs to be reconed?

A: The question of transducer life expectancy is an interesting one. Ten years ago, the answer basically would have been: "When it dies from being overpowered." Now, due to advances in transducer design such as Vented Gap Cooling®, and titanium diaphragms, plus much more intelligent system design, it is determined by many other factors. We took a poll of some of our tour sound and studio users to verify what is happening in the real world.

Transducers require reconing when the following occur:

- Acts of God or environmental hazards; for example, the large amounts of rain and mud at Woodstock 2 contaminated over 200 18-inch woofers.
- Acts of aggression, as exhibited by a fork-lift driver having a bad day and putting a fork through a loudspeaker.
- Acts of madness as demonstrated by the high heel of a boot penetrating a grille, or the wrong amp being connected to the wrong transducer.

The decision point of when a woofer needs to be reconed is a gray area. JBL regularly conducts accelerated life tests to verify transducers will continue to meet specifications after several hundred hours of use. During this testing, the transducer is subjected to about four times the maximum amount of power it would see when used with music. In tour-sound use, those who are most exacting (and can afford it) recone their woofers after about 5 years of intense duty. In many cases, performance is acceptable after 10 or more years of use.

Woofers used in studio monitoring applications commonly have foam surrounds, which more rapidly deteriorate than cloth types. The working life expectancy of foam-type surrounds is normally 2 to 5 years. In a friendly environment, they can last up to 10 years.

For both woofers and compression drivers, advances in adhesive technology has improved temperature performance of voice coils to the point that their primary failure mode is fatigued diaphragms. Titanium is used for compression driver diaphragms specifically for its fatigue resistance. Finite element analysis and life testing are both used by JBL to demonstrate diaphragm life to exceed many tens of thousands of hours. It is very rare for a user to replace a diaphragm that has not suffered extreme abuse.

Call JBL at 818-894-8850 for additional information and a list of Service Centers. Thanks to Bill Gelow and Mark Gander at JBL Professional.

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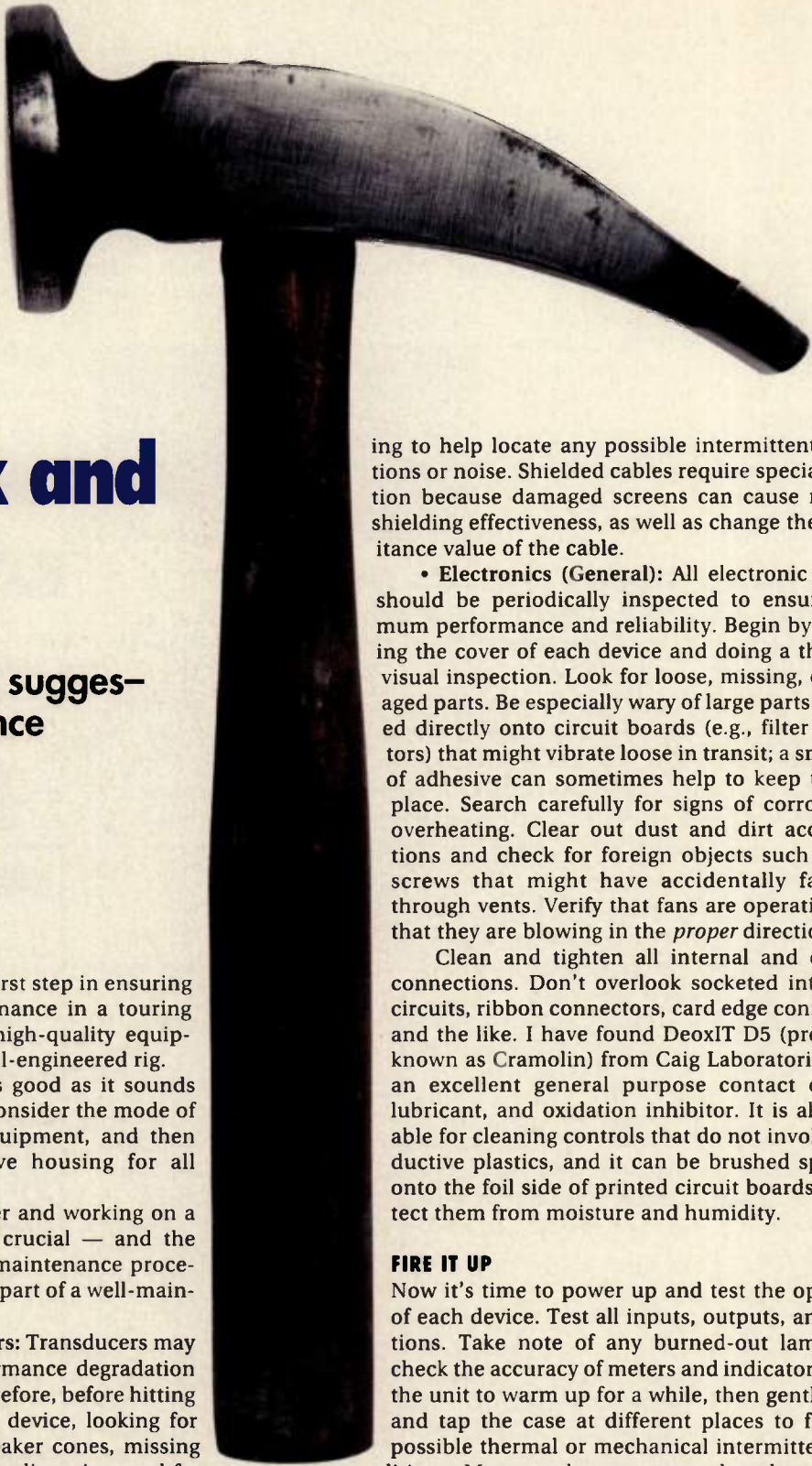
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EQ APRIL 85



The Quick and the Live

Some fast tips and suggestions on maintenance and prepping a live-sound system

BY JAMES PEARSON

It may sound obvious, but the first step in ensuring consistent and reliable performance in a touring sound system is to purchase high-quality equipment and assemble it into a well-engineered rig.

The system should look as good as it sounds and go up quickly and easily. Consider the mode of transportation for the tour equipment, and then provide appropriate protective housing for all equipment.

Once the system is together and working on a regular basis, maintenance is crucial — and the most important aspect of any maintenance procedure is attention to detail. Each part of a well-maintained rig needs looking after.

- **Microphones and Speakers:** Transducers may suffer from considerable performance degradation before they fail completely. Therefore, before hitting the road, visually inspect each device, looking for damaged mic screens, torn speaker cones, missing parts, etc. Next, check for noise, distortion, and frequency-response anomalies. Then ascertain that each output level is correct. If you have a unit that is definitely up to spec, speed up the inspection process by using it to do comparisons with other units of the same type.

- **Cables:** Visually inspect cables, searching for damaged connectors, rips, tears, kinks, and marks that may have been caused by crushing. Next, check for continuity and verify correct wiring. Move the cable around while test-

ing to help locate any possible intermittent conditions or noise. Shielded cables require special attention because damaged screens can cause reduced shielding effectiveness, as well as change the capacitance value of the cable.

- **Electronics (General):** All electronic devices should be periodically inspected to ensure optimum performance and reliability. Begin by removing the cover of each device and doing a thorough visual inspection. Look for loose, missing, or damaged parts. Be especially wary of large parts mounted directly onto circuit boards (e.g., filter capacitors) that might vibrate loose in transit; a small dab of adhesive can sometimes help to keep them in place. Search carefully for signs of corrosion or overheating. Clear out dust and dirt accumulations and check for foreign objects such as rack screws that might have accidentally fallen in through vents. Verify that fans are operating, and that they are blowing in the *proper* direction!

Clean and tighten all internal and external connections. Don't overlook socketed integrated circuits, ribbon connectors, card edge connectors, and the like. I have found DeoxIT D5 (previously known as Cramolin) from Caig Laboratories to be an excellent general purpose contact cleaner, lubricant, and oxidation inhibitor. It is also suitable for cleaning controls that do not involve conductive plastics, and it can be brushed sparingly onto the foil side of printed circuit boards to protect them from moisture and humidity.

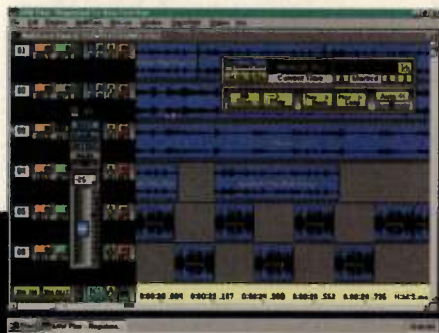
FIRE IT UP

Now it's time to power up and test the operation of each device. Test all inputs, outputs, and functions. Take note of any burned-out lamps and check the accuracy of meters and indicators. Allow the unit to warm up for a while, then gently shake and tap the case at different places to find any possible thermal or mechanical intermittent conditions. Measure the power supply voltages while varying the line voltages with a variac [a bench tool for changing, or attenuating, AC voltage] to ensure proper range of regulation. Finally, check the output for noise, distortion, and proper level and frequency responses.

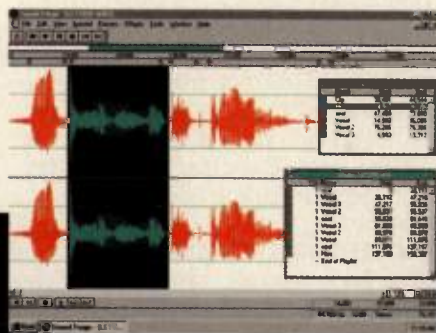
SPECIFIC ELECTRONICS

You should establish specific tests and maintenance regimens for electronic equipment. For example, sweep and

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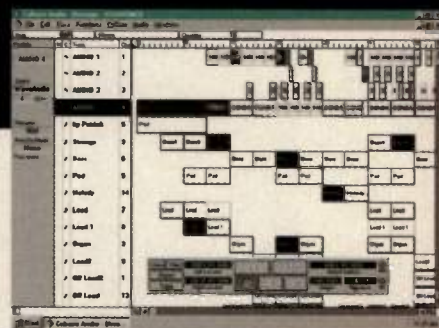
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plot the output curves of all electronic crossovers to ensure correct points and slopes. Check that current versions of software are applied to digital equipment. Clean, lubricate, and align tape machines and CD players. Thoroughly check all console inputs, outputs, VCAs, auxs, subgroups, and mutes. Plot the EQ curves and check insert jacks with a jumper. Test power amps under load for frequency response, distortion, symmetry, and oscillation.

POWER DISTRIBUTION

Tighten all connections. High-current connections are very vulnerable to thermal dynamics and mechanical vibrations, which may cause them to become loose and arc. Look over the entire distro for carbon or melting and for any indications of arcing. Replace any breakers that are known to be weak.

ARCHITECTURAL CONSIDERATIONS

Once the components are ready and the racks are loaded, set up as much of the

gear as is practically possible in sub-systems (i.e., monitors, front-of-house drive racks, etc.) and check the interfacing and grounding. Look for impedance mismatches, polarity inversion, and transformers ringing due to improper termination. Ground loops are easier to control if all or most of the equipment is balanced. This makes it possible to "telescope" the grounds, usually by leaving the shield lifted at the signal destination.

Check that ground links and switches are correctly oriented according to the system's master grounding scheme. To help make interfacing less of a hassle, label each "hot" pin on all the gear. XLR-connector polarity varies between different manufacturers, and some equipment is internally configurable via jumpers. Finally, check all wiring carefully, because changes are occasionally made on the road, and they may not have been completely documented.

SENDING THE SYSTEM OUT

Always include a system manual with the gear. It should contain operator manuals for all equipment, system riser diagrams, and notes. Such a manual can save a lot of aggravation on the road. Even a meticulously maintained PA cannot be guaranteed a zero-percent failure rate under tour conditions, especially if the tour spans many months. For this reason, it's important to be prepared and to carry a back-up for crucial components (console power supply, house crossover, etc.). Include spare parts, diaphragms, fuses, and so on, and a selection of tools. Also include regular hand tools, a multimeter, a cable tester, portable tone generator, headphone amp, current clamp, and a comprehensive collection of adapters and isolation transformers.

Finally, make future maintenance easier by establishing a reporting system for the road crew, including problems encountered and changes made. This will permit you to keep track of what is going on, and helps you to spot recurring problems.

James Pearson is chief electronics technician at Jason Sound Industries, the touring concert sound company located in Vancouver, British Columbia, Canada, whose clients include Bryan Adams, Sarah McLachlan, and The Bare Naked Ladies.



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CIRCLE 39 ON FREE INFO CARD

Maintaining Used Equipment

Two former MCI technicians roll up their sleeves and show you how to maintain some of your precious older gear

**BY GLENN COLEMAN
& EDDIE CILETTI**

This maintenance workshop is primarily for MCI owners, but the concepts apply to all equipment. Contrary to what you may have heard, the initials "MCI" stand for "Music Center Incorporated." From its humble beginnings as a repair center, MCI became a major mover and shaker in the '70s (along with other names from that era such as Harrison, Trident, Sound Workshop, API and Neve). MCI has taken on a new importance in recent years because project studios looking to upgrade have created a new market for used MCI gear. This new-found interest is a testament to the durability of the gear — and perhaps an attempt to recapture some of the romantic musical glow of the '70s and early '80s.

MUNCHY, CRUNCHY AND INNER MITTENS

After a few years your audio gear will start to show signs of age. Spray cleaners work well in a pinch, but this is only

temporary relief for nonrepairable controls such as pots and switches. One affliction that affects all contact-critical devices is called "Relaxed Spring Tension" (RST).

The material used to make connections is typically either a precious metal plated over beryllium copper or stainless steel. When pots, switches and even "serviceable" faders fail to respond to cleaning, it is due to RST — the metal is no longer capable of maintaining sufficient pressure. That this phenomenon is audible is both a blessing and a curse. Funky connections are far more difficult to troubleshoot when hidden, for example, in a tape machine's control circuit.

Last month, *EQ*'s maintenance column showed you how to desolder an unsocketed IC, a skill that will pay off this month, especially if \$\$\$ is your bottom line. Buying spare parts is not expensive, but paying a technician to replace all the switches in a console or all of the IC sockets in a tape machine is not for the financially challenged. Most techs are more than willing to be paid to teach soldering techniques. With luck, they will also pass along some of those hard-earned "gotcha's" to willing students.

OK gentle folks, it's time to fire up ye olde soldering iron.

THE LOVE SOCKET

There was a period when MCI used red IC sockets in both consoles and tape machines. These must always be replaced. Mechanical vibration, plus expansion and contraction from heating and cooling cycles, all contribute to poor contact connections. This is compounded not only by the aforementioned RST, but also by the fact that neither the IC leg nor the socket material are plated with a precious metal.

Note: Silver-plated contacts are an improvement, but only if the connection is designed to be self-cleaning. Silver turns black when oxidized. An oxidized contact actually behaves like a diode — an electronic one-



...A WORD FROM OUR SPONSORS, PT. 2

Q: What things should tour engineers do to prevent loudspeaker failure?

A: The Number One cause of death for pro-audio loudspeaker components is amplifier clipping. The prevention of this is very simple: make sure you have adequate amplifier power. The Number Two cause of death is asking your systems to do too much. Make sure you have adequate hardware for your artist and venue. The Number Three cause of death is improper matching of your crossovers/processors to your loudspeakers. You must have proper crossover frequencies and slopes, proper level relationship between the [frequency] bands, any required EQ, and limiting.

There are several things you can do pre-tour to prevent component failure.

- Perform a pre-tour inspection where you visually inspect cone speakers for signs of fatigue and wear.
- Sine wave sweep your loudspeakers to listen for things like voice-coil rubbing or for foreign objects trapped in the voice-coil gap. Also, listen for audible signs of invisible mechanical problems such as buzzing from loose tinsel leads.
- Perform a transient test like a synthesized kick drum signal from a drum machine. This lets you listen for audible mechanical problems.
- Physically inspect your systems for loose driver attachment bolts and loosening of other mechanical fasteners.

• Perform a mechanical inspection. Make sure that the input connectors are in good shape, both mechanically and electrically. See that there are no shorts and that the locking mechanisms are in place. The two major speaker connectors are Neutrik "SpeakOn" and the Cannon AP/EP Series. EAW's VATA members, who dominate the SR marketplace, use both brands with equal success.

Thanks Kevan Gibbs and Andrew Rutkin at EAW.

way street — passing only half of an audio (AC) signal and possibly none of a DC signal.

AUTO LOCATOR

Here are two common MCI tape machine auto-locator problems:

PROBLEM #1: When locate is pressed, the machine goes most of the way to the locate position, but then slows down to a crawl — or even stops — but remains in the locate mode (FF & REW lamps on).

PROBLEM # 2. Pressing the Tape Velocity Indicator (TVI) switch crashes the locator. The system must be powered down before coming back to life.

The source of these two problems is a pair of ICs located under the Phase Lock Loop/Capstan Servo board. (All nonaudio boards are situated directly under the transport.) The two chips are 8-pin-type 741S single op amps

mounted in sockets on the mother board. Both problems can be temporarily resolved by reseating and/or replacing the two ICs.

THE REEL SOLUTION

The long-term solution is to use gold-plated, machined-pin sockets. (See the parts sidebar for sources.) The old socket consists of two pieces of plastic. The top half can be pried off with a small screwdriver. The bottom half can be cut away with a small pair of flush cutters. The pins can then be desoldered one at a time.

Molex connectors are another place for connections to become intermittent. Gold pins are available, but that is only half of this labor-intensive task. One alternative is to remove the female Molex contact from its housing so that it can be cleaned with alcohol, burnished with a tool, and bent to increase pressure

PARTS AND SUPPLIES

For equipment that is 10 to 20 years old, parts availability becomes a major concern. Sony, for example, no longer supports any of the MCI "JH" series. When their current parts supply runs out, they will not be restocking. However, there are many third-party companies supporting all of the common wear-item parts for tape machines.

Company	Services	Phone	Manufacturers Supported
Amp Services	Head, motor and tachometer restoration	800-862-0601	All
Athan Corporation	Pinch Rollers, tape guides, motors, tachs	415-589-5206	All
ATR Service Company	Pinch Rollers, tape guides, motors, tachs	415-574-1165	Ampex
Bart Goss	3M M-56 and M-79 tape machine parts	801-674-9667	3M M-56 & M-79
Blevins Audio	Console and tape machine parts	615-242-0596	MCI (used equipment)
Dale Electronics *	Console and tape machine parts	212-475-1124	Sony/MCI, TASCAM, Fostex, Panasonic
Dan Sheperd	3M M-56 Tape machine parts	702-454-6660	3M M-56
JRF Magnetic Sciences	Heads and head restoration	201-579-5773	All
MDI precision motor works	Motor restoration	508-562-4420	All
Sony parts dept (Kansas City) *	Console and tape machine parts	800-331-6679	Sony/MCI

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* must have a part number

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to the pin. Also, inspect the soldered end of the pin. If funky-looking pins can be turned with a long-nose pliers, the connection is "cold" and should be resoldered.

ARCHY O'LOGIC, DIG?

Heat and dirt are the enemies of all equipment. Power supplies should be cleaned with a vacuum cleaner and a soft paintbrush (to loosen dirt) at least twice a year, more if the environment is dusty. Fans draw dirt into the "chimney" where it collects and clogs heat-sink cooling fins. Noisy fans will eventually stop, causing even more trouble for transistors and regulators. Replace before failure.

While you are in the power supplies, tighten all filter capacitor screws, which, if loose, can cause buzz or hum in the audio system. Clean all circuit board edge connectors with a clean cloth saturated with denatured or anhydrous (99 percent) alcohol. Do not use an eraser to clean gold contacts because the gold is only a "flash" plating that is very easily removed. Once exposed, the vulnerable copper underlayer is very difficult to keep clean. If your [cleaning] cloth turns greenish, it is a sign that very cold spray cleaners have been used.

NOTE: Cold metal condenses moisture; the copper turns green to "protect" itself.

TENSION AND HEAD ACHES

When playing old tapes, oxide shedding can be so bad it will bring the machine to a complete stop. If it's embarrassing for you to call a technician just to clean the heads and guides, grab a bright light for a closer look before getting on the phone. (More about tape restoration in a future article.)

As with most tape machines, some of the more common MCI problems are tension related. Before a problem actually prevents you from making music, have a technician confirm that the tension is within spec. Too much back tension (from the supply reel) will prematurely wear the heads. Too little back tension may cause the tape to skew out of the guide just before the pinch roller. Both situations will make the machine difficult to adjust and maintain calibration.

continued on page 123

Crash 'n' Learn

How to avoid problems with your hard disk through the use of a little preventive maintenance

BY EDDIE CILETTI & CRAIG ANDERTON

Hard drives have no user-serviceable parts (except for the technique described in December '95's "MI Insider" column for swapping out the control board if it, and not the platter itself, is bad). However, a little preventive maintenance can help extend the life of your hard drive.

PREVENTIVE MAINTENANCE

- Pay attention to early warning signs. If you start to hear a nasty rotational noise, immediately back up everything! The noise probably indicates that the lubrication on the ball bearings that allow the platter to spin has broken down or dried up. Fans (replacement cost about \$15) use much cheaper bearings and are even more prone to this type of failure.

- Heat is the enemy. Make sure the fan/filter combination provides unobstructed air flow to prevent platter motor failure.

- To keep from losing the heads and the disk surface, avoid high impact shocks to the drive, especially while it is moving.

- Pray that the power doesn't go down during a write operation (yet another argument for an uninterruptible power supply).

- Become a librarian. Since your hard drive will fail someday, always make copies of important files either on floppies, backup tapes, a second hard or MO drive, or a recordable CD. Regular backup is vital!

- Reformat your disk periodically (but beware of copy-protected software; see below). If your drive gets too full, files are broken up into multiple smaller fragments (fragmentation). This degrades disk performance because the head has to search around to find and store information. To reformat, back up all data to another storage medium, fully erase the data from the drive, reformat the drive using appropriate software (e.g., Disk Tools from the Mac's system disks), then copy back the saved data.

- If you own legal copies of all software, you needn't waste valuable space backing up the programs as long as you can reestablish your preferences and files.

- Try the "Shake and Shimmy Treatment." Power down, disconnect all peripherals, open the lid, pull any cards (video, sound modules, drive controllers, etc., and especially NuBus cards — but note their respective slot positions), turn the computer on its side or upside down, and use a light shaking motion to dislodge any loose bits (loose screws, wires, etc.). Some Mac users will have to remove the power supply because it plugs directly into the motherboard. Vacuum the fuzz balls (don't forget the fan), then, exercise all power and data connections to the drives and motherboard by unplugging and then reinserting. This removes some contact oxidation, and a light shake may actually unlock a stuck drive. Return the cards to their original slots, replace the cover, reconnect and restart.

DOS/WINDOWS/3.11/95/NT TIPS

On the DOS side of a PC, many programs modify your `autoexec.bat` and `config.sys` files. These are located in the root directory (`c:\`). With Windows 3.1 or Windows for Workgroups 3.11, there are many more places to hide. In the Windows directory or folder, initialization files (such as `win.ini` and `msmail.ini`) store preferences and configuration information that load each time you boot. A windows program called SYSEDIT automatically finds and allows you to modify all relevant files.

During the normal modification process, Windows modifies the `auto`, `config`, and `.ini` files every time you add a program or a driver. Backup copies of these files are automatically made by changing the extension of the file name (`win.ini` becomes `win.001` or `win.bak`). You can identify which was the most recently used `.ini` by sorting by extension and looking at the dates.

Just for protection, copy `autoexec.bat`, `config.sys`, and the aforementioned `.ini` files into a directory called "Vault," making them inaccessible to the system. Then copy these files to a floppy. If a problem occurs, relocate the suspect files to a temporary folder and copy the known working files to their respective spots — usually via DOS if Windows is not capable.

MAC TIPS

There is still much copy-protected software for the Mac; these are generally "installed" on your hard drive, which sprays little invisible files around your system. *Never* defragment, optimize, or reformat a hard drive without deinstalling any copy-protected programs, or you will lose the install.

Optimize only after deinstalling the program(s). On the Mac, use the color coding options to identify all copy-protected software, or when you first use the program, simply drag it over without officially "installing" it. This will require you to insert the program disk each time you want to run the program, but you'll be safe from installation-related problems, or losing an install if your hard drive crashes.



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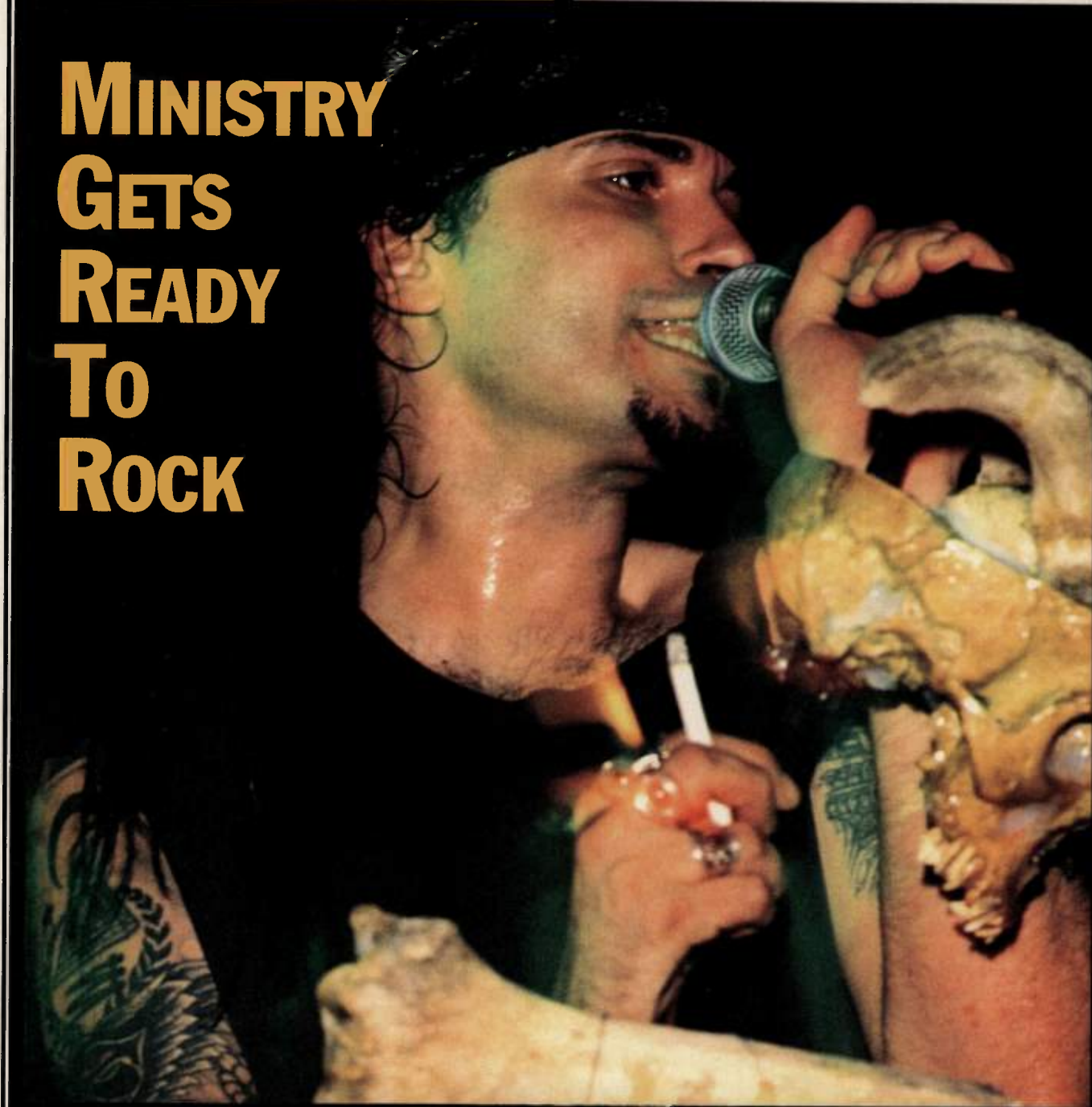
EQ

LIVE

NEW GEAR PAGE 104



MINISTRY GETS READY TO ROCK



Photos by Kristin Callahan

SPHINCTOUR Boys



MINISTRY AND FOH ENGINEER BILL SHEPPEL PREPARE FOR SPHINCTOUR 1996

BY ROBERT GRANGER

WITH SPRING around the corner, it's time for most of the bands that released albums during the late fall and winter to dig up their sound engineers, dust off their consoles, tune up their gear, and hit the tour circuit. Probably one of the most anticipated club tours announced so far this year is Ministry's Sphinctour 1996, which is in support of their latest release, *Filth Pig*. The quasi-industrial musical terrorists, led by guitarist and vocalist Al Jourgensen and bassist/vocalist Paul Barker, sent crowds into a moshing frenzy at '92s Lollapalooza festival (which had the band playing with as many as six guitarists at a time), and a headlining stint afterwards had them selling out the-

aters and small arenas within minutes.

With the tour scheduled to start in Oklahoma City on March 29, the band, as well as their newly appointed FOH engineer Bill Sheppel, are now gearing up for a tour that will last well into the year. *EQ* recently caught up with Sheppel and Ministry's Barker as both were in preproduction getting things ready in their separate corners to get the tour off the ground.

THE ENGINEER'S SIDE

"I've been Ministry's monitor engineer for the last couple of years," explains Sheppel, "and Lee Popa, who was their house engineer, has moved into doing some record-type stuff. So the spot became open and the band gave me the choice of what I wanted to do, and I've been moving towards front of house for a while."

With more than ten years of experience and a resume that includes monitor duties with ZZ Top, Jeff Beck, and Joe Cocker, Sheppel is more than qualified to mix Ministry's maniacal sound. "I just took the shot to go to front of house and I brought Bill Head, who's Aerosmith's monitor engineer, to take over the monitor gig, because Al and Paul are pretty strict when it comes to their on-stage sound, and I think Bill's got what it takes to handle it."

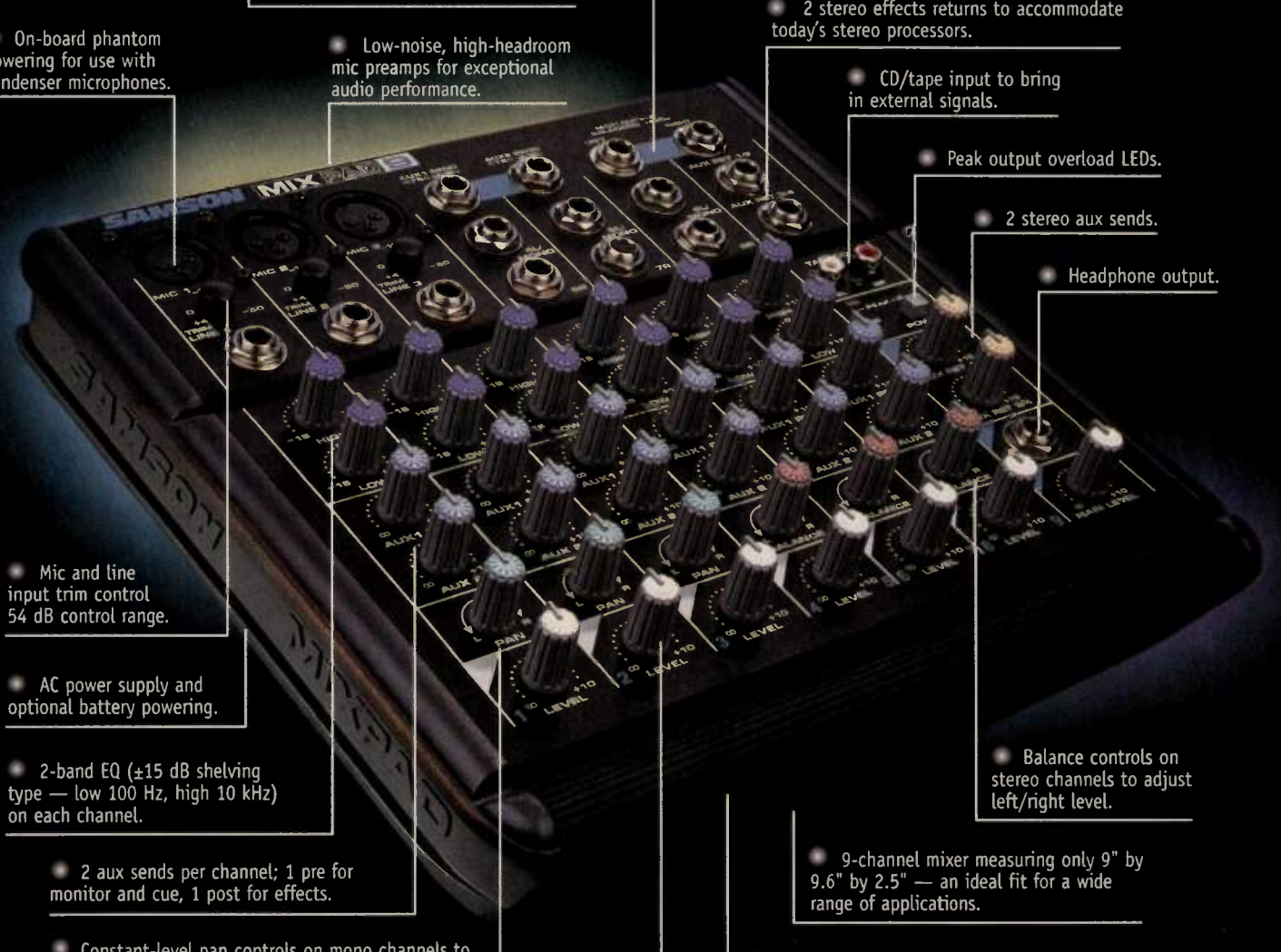
Taking over the front-of-house job position brings a lot of responsibility with it, especially at the beginning of a tour. Sheppel had to spec out a touring rig that would accommodate both the band and the venues they'll be playing. "We'll be carrying a Showco Prism rig for this tour. The band's booking agent has a rough itinerary that's not really set

in stone, but it gave me a good idea of how many people we'll be playing to. We're going to be doing theaters, small arenas, and a couple of smaller 3000 seaters. The bulk of the tour is averaging out to about 4000 or 5000 seats per show, with a few exceptions like the Arco Arena in Sacramento, which holds about 6500, the Fairpark Coliseum in Dallas, which holds about 8500, and the Summit in Houston, which holds 9000. So I was looking for a real versatile system, and the Prism fit the bill."

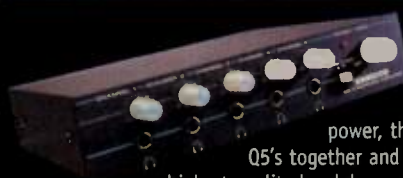
The Prism system that Sheppel chose to go with is a five-column-per-side small arena system with nearfield speakers for the center, six subs per side, and four front fills. The system is rated at about 140,000 watts. As for the console, Sheppel will be using a Yamaha PM4000

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MONSTER MOSH: Ministry's Al Jourgensen gets the crowd moving.

with 44 mono and 8 stereo ins. The main effects rig will consist of an AMS 1580S digital delay, an Eventide H3000SE, a TC Electronic 2290, two Yamaha SPX900's, and two Yamaha SPX90II's for reverbs, delays, and vocal treatments. "I'll also be using Aphex 612 noise gates and a few different types of limiters — Klark-Teknik, dbx 160X's, and some tube limiting — to keep things nice and tight.

"The way that the Prism system is designed, it's going to be ideal for this tour," states Sheppel. "Anywhere I can, I'll fly the rig. The top row of the Prism is a long-throw cabinet, and if it's a shorter room I'll leave that row out. Since I'm going to have a five-column grid, I can take the whole rig up in the

bigger places, and in some of the smaller ones I'll do a stack, where I'll mix in some of the different PA cabinets with the full-range front-fill cabinets and the subs."

Based on his experience as Ministry's monitor engineer, Sheppel also spec'ed out a monitor system that he felt would most benefit the band. "We'll be carrying a Harrison SM5 with extender, as well as 16 Showco SRM monitors, and three drum subs — two for Ministry and one for the opening act. We're going to be using four Prism full ranges flown per side over two double 18 subs. The monitor rack will consist of an AMS delay, an Eventide H3000, a Yamaha SPX900, six Klark-Teknik DN360 EQs, four Drawmer DS201 gates, and

four Klark-Teknik DN504 compressors."

As for miking requirements, Sheppel is pretty Shure of the route he's going to take: "Right now, I have a good relationship with Shure," explains Sheppel, "and the band's going to meet with representatives from Shure when I get to Chicago within the next week or so, so it's possible we'll be using a majority of Shure mics. What I'm planning on right now is a Beta 52 and an SM91 for the kick drum. The alternative would be a beyer M88. The snare and the toms will be Beta 56's, the condensers for overhead will probably be SM81's, and we might possibly have some AKG C414's. The guitar mics will include a Beta 56 and Sennheiser 409 per stereo rig, and a Beta 58A for Al's vocals. Everything else — the samplers, the keyboards, the ddrums — will be all DI."

Since Sheppel hasn't even gotten together with Ministry yet to run through a full-production rehearsal, you may be wondering what he's doing to get himself ready for the tour. "Basically, I've been listening to the new album a lot and taking notes — noting a lot of the panning, all the reverbs — and what I'll do when I get there is see who's playing which guitar part. They've added a new guitarist to the band, which means I'm going to have to see how the old stuff has changed. Fortunately, the new album has a lot less samples and is more straightahead, so it'll be easier for me to come in.

"During the last few tours, we spent a lot of time in band rehearsals, leveling samples to where we wanted them so we didn't have to compress them. So I'm going to go into rehearsal with the band, do my sampling charts on the new songs, and put that against my notes on the

record to see what's getting panned and which does what so when we get into full production, my job is a little easier."

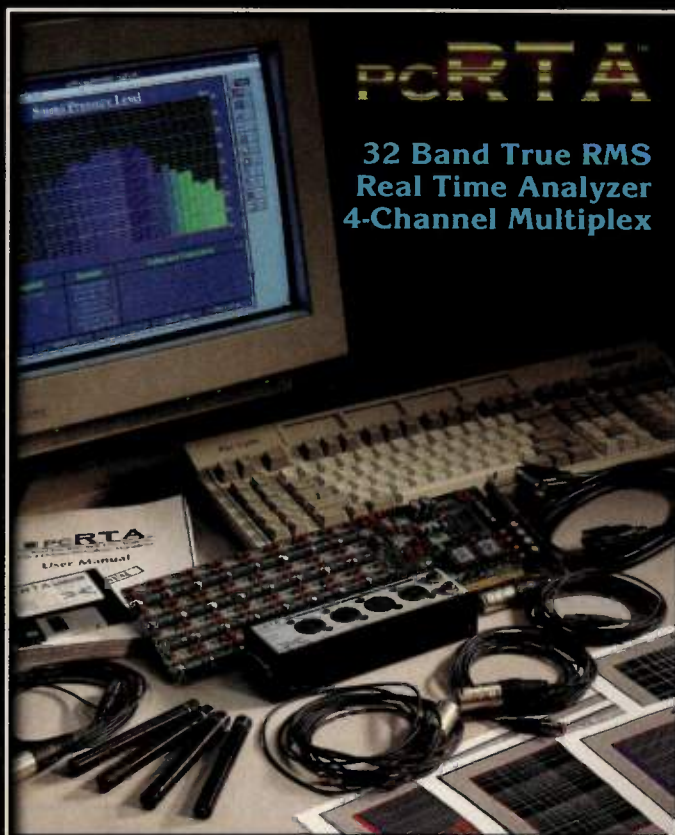
THE BAND'S SIDE

"Basically we've just been doing preproduction so far, which to me is just grunt work," states Ministry's bassist Paul Barker. "We can do what we're doing now in a garage because that's pretty much all we need. We have to figure out how we're going to do the song arrangements; how we're going to do the keyboard layouts with all of our samples and loops. Basically we have to figure out how to meet the song's demands. Then we just simply work out their arrangements; the grunt work of learning the nuts and bolts of the new music like the back of your hand so there's no problem in a live situation. Bill's going to come out in about ten days or so to spend a few days with us here at the current location. Then we're going to full production to rehearse for four or five days so Bill can get his stuff down."

Barker is quite confident in the band's choice to ask Sheppel to do front of house, and he's really not too worried about the details of the sound system or what the tour will bring. Right now, he and his cohorts are more interested in getting the set down cold and technically in order. "By and large, the new record is fairly stripped down as far as samples are concerned, so that isn't quite as much of a challenge as our past live outings. We are working on 'The Fall' right now, which is the song with the thickest layering of samples on *Filth Pig*, so that's a challenge. So we're concentrating on that right now."

continued on page 126

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CLUB PROFILE: ELECTRIC FACTORY

Photo by John Lafferty



ON OCTOBER 8, 1995, *Electric Factory Concerts* — a company primarily known for promoting concerts in the middle-Atlantic region of the U.S. — opened a new club in downtown Philadelphia, PA called *Electric Factory*. Since opening day, the venue has been host to acts such as Joan Osborne, Alanis Morissette, Bob Dylan, Collective Soul, Lenny Kravitz, Iron Maiden, The Ramones, and Lou Reed.

Electric Factory is a two-level club with a capacity of 3600 located in a building that used to be an old warehouse/factory. The primary club area on the first floor is about 130 feet by 80 feet, and then there is an upstairs balcony/bar area that is about 110 feet by 35 feet. According to Electric Factory/Clair Brothers systems engineer Franklin Simon, "There are no seats installed on the floor of the club, but we do run seated shows for special events like the upcoming Joan Baez show. I personally like having the seats because we get a bit of diffusion from them, which breaks up the room reflections.

EQ GOES BACKSTAGE AT A NEW ADDITION TO PHILADELPHIA'S CLUB SCENE

BY STEVE LA CERRA

"Electric Factory has 45-foot ceilings and there are well over 4000 panes of glass along the walls. Combined with the concrete floors, these materials obviously cause quite a bit of reflection due to their low absorption coefficient. So we have used over 1000 square yards of fabric hung from various points over the windows and rafters to break up the reflections and absorb as much sound as possible.

"We also had a Dubentine-style coiffure installed over the stage area and filled it with 4-inch rock wool because we were getting tremendous slap — especially with snare drum — off the concrete ceiling. A coffer is kind of like a sub-ceiling frame suspended above the stage with a curtain that hangs down around the perimeter of the stage. This has eliminated quite a lot of the slap that was coming off the ceiling and it has

made the stage quite livable. Acts have generally been pretty happy with the onstage sound, whether it's using our Clair monitor system or a monitor rig that they have brought in."

The house mix position in Electric Factory is located on the first floor at 58 feet from downstage-center on a one-foot riser. The system uses 12 Clair Brothers Audio S-4 II speaker cabinets with two per side flown and then four per side on a deck separate from the stage. The floor stacks were placed on the deck to avoid transmission from the speaker cabinets back to the mics on the stage.

Clair's S-4 II is a ready-to-go four-way cabinet with 18's, 10's, 2-inch midrange drivers, and one-inch tweeters (this is the touring cabinet Clair uses for everybody from U2 to Michael Jackson). There are also two S-4 sub-bass cabinets with two 18's per cabinet placed downstage center. Franklin notes

that the "S-4 subs are very efficient — for only two 18's in a cabinet, it's probably one of the louder front-radiator-style subwoofer cabinets. The subs are driven in mono (with a dbx 160XT compressor for protection) from an aux bus off the house console. We set the system up this way so that an engineer can get his mix together and then use the aux bus to add some 'oomph' to the kick drum, floor toms, and bass without feeding unnecessary program material into the subs. It makes the S-4's run very efficiently."

All of these cabinets are driven by Clair/Carver power amplifiers (Clair has modified the Carver amps to meet their specifications). These amplifiers are driven with the Clair S-4 II processor in a three-way active/four-way passive configuration. The house and delay systems (more on those in a minute) are running about 35,000 watts. There are six dbx 160XT compressors used for protection — and the system is capable of reaching about 112 dB at the mix position before compression even begins to kick in.

The house console is a 40-input Yamaha PM3000. Typically, Simon allows for about 35 inputs from the stage and then uses the remaining five inputs for effect returns. Outboard gear includes eight Klark-Teknik DN504 compressor/limiters, eight Drawmer gates, two Yamaha SPX1000's, a Lexicon PCM 70, and a Roland SDE3000 delay. There is also a TC Electronic 1280 delay. In the system drive rack there are Klark-Teknik DN27A third-octave equalizers, as well as a set of Klark DN360 equalizers and a spare Clair processor.

ZONING OUT

Because Electric Factory is such a large club, Franklin and Clair have set up several delay zones to fill in the program material from the house PA. Franklin states, "At 63 feet from downstage center (five feet behind the house mix position), there are four Clair R-4 cabinets (two per side, flown) that make up our primary delay zone. They are about 18 feet off the floor and pointed downward to the listeners. The way the matrix on the PM3000 console is set up, I can send subgroups or the entire program — which I tend to do more — to this delay zone. I'm happy with about 67 ms delay (also from a TC Electronic 1280) for these R-4's, which brings them into focus with the entire house PA."

Unlike a traditional balcony/bar area, the balcony at Electric Factory is off to the right of the performance area and actually runs right up to the stage, so there's no way to get proper coverage from the main PA underneath the balcony. Simon explains, "We have an entirely separate delay system for this area. This system has two zones, each using two Clair P-2 nearfield cabinets (containing a 12-inch and a JBL 2450 with a Clair custom horn), powered with a Clair/Carver amp. The first set of P-2's are used almost like a nearfield fill; they are placed inline with the main house system, but directed under the balcony. These amps have their own built-in processors that handle the crossover, time alignment, and primary EQ for the cabinets, so I don't have to mess with outboard units. Every zone is on its own third-octave EQ, either a Court GE 60 (from Jim Court/England) or Klark-Teknik DN360, and they are compressed with dbx 160's for protection. These cabinets are flown at about nine feet, so they are above the listen-

ers' heads. Then 40 feet from the front of the stage, underneath the balcony, are another pair of P-2's in their own delay zone for nearfield fill."

Upstairs along the large bar (which is about 120 x 40), are 12 P-2 cabinets set up in six delay zones using TC Electronic 1280's. There is a pair of P-2's in each zone, and each zone is approximately 20

feet apart. So as you walk down the bar, every 20 feet there are a pair of P-2's (spaced about ten feet apart) to cover the bar. These P-2's are mono. Since the whole bar area is on the right-hand side of the house fill, people listening from this area would not hear the left side of the mix if the bar system was in stereo.

These cabinets are

flown at about 11 feet high and angled downward toward that particular listening area. Simon comments, "It's a pretty smooth transition, and you get even coverage wherever you are listening from. Again, for each zone I can use the matrix outputs from the PM3000 to change the mix and add more vocal or more guitar."

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MONITOR LAND

Electric Factory's house monitor system uses a Ramsa S840 40x16 monitor console, currently running ten mixes, which Simon finds adequate for most of the shows that they do. "Court GE 60 EQs are used on the monitors, and I find them to be real smooth as far as phase shift is concerned. For monitor cabinets, we have ten Clair LP-15 slant monitors. Each of these has a TAD 15-inch woofer, a JBL 2441 driver with a Clair custom wooden horn that really sweetens the midrange, and a JBL 2405 passive high-end tweeter with a modified 2402 lens.

"The LP-15's are time-aligned, phase-corrected, and crossed-over through Clair/Carver AM-series amplifier racks. These ampli-

fiers can drive either the LP-15 or the AM-12 monitors, and we do have a pair of AM-12's that make up the drum fill along with two Clair ML-18 subbass cabinets (the ML-18's are very compact and have a lot of output for drummers who want their pants to shake). The AM-12 cabinet houses a 12-inch woofer and a JBL 2450, and is similar to the P-2 but is processed differently for monitor applications. There are also three-way stereo side fills for the stage — stage left and stage right each have a Clair 4145 sub-bass cabinet (with four 15-inch JBLs) and Clair M-4-N mid-high cabinets, which have a Community M4 driver and a JBL 2450 2-inch compression driver. Clair/Carver AM-series racks are used to drive the side fills as well."

Effects available in monitor world include Valley gates, Behringer compressors and Yamaha SPX90 II reverbs.

Since Electric Factory anticipated that a lot of acts would come in with their own monitor rigs, they installed a Clair 40-channel, double-monitor split. Each input from the stage is split to three places: the house, the monitor console, and then to an extra line available for a guest monitor desk. Franklin has observed that about 60 percent of the acts will use the house monitors and about 40 percent will bring in their own monitor rig as well as their own house console and processors. "The extra split makes connecting a guest monitor desk really easy," he adds. "Usually acts carrying their

own monitors carry their own mics, but our selection of microphones is pretty well-rounded. We have six AKG C460's, two AKG C451's, two Sony ECM-33's, 14 Shure SM57's, eight Shure SM58's, one Shure SM87, four Sennheiser MD421's, two AKG D112's, five beyerdynamic M69's, beyerdynamic M88's, and also 11 Countryman DIs."

Overall, the sound system at Electric Factory is probably one of the premier club sound systems installed in the United States. Simon finds that an interesting thing is happening with acts coming to perform here: "Many of them are already carrying production, but when they are told there is a complete Clair Bros. system here, they are very happy to leave their gear in the semi!"



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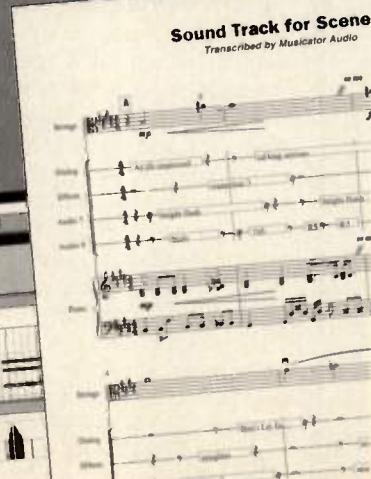
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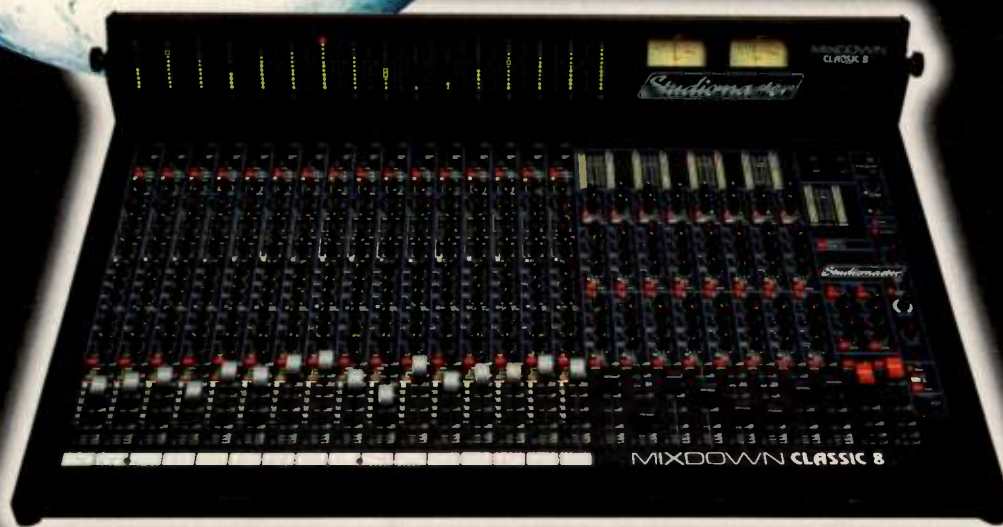
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INPUT CHANNELS - All input channels are crammed full of features including balanced mic and line inputs, inserts, direct outs, +48V, 20dB mic pad, three band EQ with sweep Mid sweep Low & EQ cut, six aux busses, MIDI mute, PFL and smooth 100mm fader.

OUTPUT SECTION - The sixteen tape monitors can be used as extra inputs bringing the total number on a 16 channel up to 34. The upper row of inputs even feature two band EQ, PFL, a couple of aux sends and fader reverse. All output groups have insert points. 12 segment bargraphs and 100mm faders. A line up oscillator, stereo return and a built-in talkback mic.

8

WHEN YOU NEED TO GET SERIOUS....



Stuudio-master

CIRCLE 75 ON FREE INFO CARD

NEW GEAR FOR YOUR NEXT GIG

HEARD IT ON THE RADIO

Performers who take their act on the road internationally may want to check out Garwood's new Radio Station I.D.S. wireless ear monitors. The system possesses the qualities of the company's Radio Station combined with synthesized technology for international use. The I.D.S. UHF system features legal frequencies between 510-900 MHz and is comprised of a processor/transmitter, active antenna, and belt-worn receiver. Users can select frequency settings that correspond to the country in



Garwood Radio Station

which it is to be used via two buttons. The system automatically pre-selects a set of legal radio frequency options for the selected country, and from this list, the user can choose the desired operating frequency. The frequencies pre-selected by the unit are free of intermodulation, so multiple systems can be used simultaneously. Other features include an Operation mode that locks the receiver to the programmed operating frequency, Garwood's compansion noise-reduction system, and a threshold compressor with dynamic



Audio-Technica's 1100 Series

ratio circuitry to prevent overmodulation. For more information, contact Garwood Communications, 4 Terry Dr., Suite 10H, Newtown, PA 18940. Tel: 215-860-6966. Circle EQ free lit. #122.

GET AUDIO TECHNICA(L)

The Audio-Technica 1100 Series consists of the ATW-1127 UniPak transmitter, the ATW-1128 handheld dynamic mic system, and the ATW-1129 handheld condenser mic system. All three systems feature true diversity reception with two independent RF sections, and a selection of 20 VHF frequencies. A ground-lift switch on the receiver and adjustable squelch control are both standard fare with Audio-Technica's 1100 Series. A minimum operating range of 200 feet is offered, while dual-power battery-save switches on all transmitters may be set "high" or "low" for extended battery life. For more information, contact Audio-Technica, 1221 Commerce Drive, Stow, OH 44224. Tel: 216-686-2600. Circle EQ free lit. #123.

MIGHTY MOUSE

The Klipsch Professional KP-110-B has been dubbed the "Mighty Mouse" of performance monitors because of its compact size. It is designed for use in live or studio nearfield applications, including keyboard, stage monitoring, and recording. The KP-110-B features a Tractrix Wave horn that provides a controlled beamwidth of 110



Klipsch KP-110

degrees in both the vertical and horizontal planes. The low-frequency component is a long-stroke woofer. For more information, contact Klipsch Professional, 149 N. Industrial Park Rd., Hope, AK 71801. Tel: 501-777-0693. Circle EQ free lit. #124.

GIZMO ROKS

Gizmo Bags from Rok Sak are specifically designed to carry many of today's modern musical electronics. Gizmos come in eleven models that can support approximately 300 different models from manufacturers such as Mackie, Alesis, Korg, and more. Gizmos are made of heavy-duty, water-resistant Cordura, while the main compartment and accessory pouch are lined with velour. A thick foam shell protects Gizmos from the rig-



Gizmo Bags

ors of travel, while dual zippers make opening and closing simple. Other features include dual-handle straps, a 50-pound weight-bearing capability, an adjustable shoulder strap, and shoulder pad. List prices start at \$20.95 to \$45.95. For more information, contact Music Industries, Corp., 99 Tulip Ave., Floral Park, NY 11001. Tel: 516-352-4110. Circle EQ free lit. #125.

GAINING W8

The W8C compact touring system from Martin Audio is the compact version of the Wavefront 8 designed for use in a W8 flown array as an underslung cabinet to cover the nearest rows or as an inverted cabinet on the top row to increase high frequency throw in large

venues. It can also be used above 120 Hz as a stand-alone array component in touring or club situations where the full frequency low-mid band (850 Hz-3.5 kHz) is produced by a 6.5-inch cone driver loaded by a toroidal phase plug and horn that maintains constant 55 degree horizontal dispersion. Above 3.5 kHz, high frequencies are handled by a 1-inch exit compression driver. For more info, contact TGI North America, 300 Gage Ave., Unit 1, Kitchener, Ontario, Canada N2M2C8. Tel: 519-745-1158. Circle EQ free lit. #126.

UTILITIES INCLUDED

TASCAM's M-08 compact utility mixer includes four mono and four stereo inputs with 4 XLR balanced mic inputs and phantom power. Each channel has a 2-band EQ, overload indicators, two aux sends (pre/post), level and pan controls, and mute and PFL switches. The M-08 provides four effect returns, inputs to the Aux and stereo busses, as well as a tape input for monitoring and preplay functions. TASCAM offers a gain control on the stereo channels and a trim control on each of the four mono channels plus inserts for accessing additional signal processors. Retail price is \$349. For more information,



TASCAM M-08

contact TASCAM, 7733 Telegraph Road, Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #127.

So SP(ECIAL)

Peavey's SP line of sound-reinforcement enclosures now includes trapezoidal enclosures for the SP 2G and SP 5G speakers, improved performance in the Black Widow woofers loaded in the SP 2G and SP 4G, and a new high-frequency driver protection circuit called the Sound

Guard. This circuitry is a switching mechanism that doesn't affect the original signal until excessive power is introduced into the system. Only then does the signal see the protection circuit that offers a more linear approach than the usual light bulb. Other additions to the SP line include two new floor monitors, the SP 112M and SP



Peavey's SP Line

115M. For more info, contact Peavey, 711 A Street, Meridian, MS 39301. Tel: 601-483-5365. Circle EQ free lit. #128.

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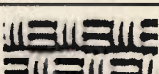


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CIRCLE 52 ON FREE INFO CARD

Gold Line FD-23 Feedback Detector



IF THERE'S ONE thing that most engineers would agree upon, it's that they dislike feedback. It's annoying, can distract the band, and if it gets out of control, it can disturb your audience. One of the most popular ways to help combat feedback is through the use of a 31-band, third-octave equalizer, and these units are most effective when the engineer can quickly recognize the frequency at which feed-

back is occurring. For experienced monitor engineers, this might not be a problem. But for others the solution has been to carry a spectrum analyzer. The trouble with this is that good analyzers cost a lot of money and aren't always easily moved to a remote location. What if you could have a compact analyzer that doesn't cost an arm and a leg, could be put in your pocket (OK, your briefcase) and would be accurate enough to help you identify the frequency feeding back? Enter the Gold Line FD-23 Feedback Detector.

This new measurement tool from Gold Line is not intended to replace a spectrum analyzer, but it really augments an analyzer as a portable tool and serves people who don't have the dough to blow on an analyzer. The FD-23 is a self-contained unit (good move Gold Line) that contains an analyzer, condenser measurement microphone, and power supply in a case that is about the size of a walkie-talkie. And at a suggested list price of \$259, purchase is a reality.

The unit can be powered by eight alkaline AA batteries (which will die a

rather quick death) or by eight rechargeable AAs. When the unit is connected to an external wall-wart power supply (12 volts DC @ 200ma), the NiCads can be recharged while the unit is in operation. Do yourself a favor and go for the power supply and NiCads, because using alkalines is going to be expensive (and environmentally wasteful). [Gold Line states that alkaline battery life is between 15 and 24 hours.] An internal switch selects use of either the NiCads or alkalines.

The way that the FD-23 operates is relatively simple because it uses the same filters employed in Gold Line's big-boy analyzers. The only external control on the unit is an on/off/sensitivity dial, and by clicking this on (there is a five-second turn-on delay), the front-panel LED display will come to life. Now if you have an audio program playing, a bunch of LEDs will dance along to the groove, but the idea is that you need to turn the sensitivity control down until a minimum of LEDs are lit.

If a frequency is ringing and the sensitivity is set accurately, the display of the FD-23 — which has LEDs for third-octave frequencies from 80 Hz to 12.5 kHz — will light an LED representing the frequency that is ringing (within that third-octave tolerance). Your 31-band equalizer just so happens to have gain adjustments at the same frequencies (how convenient), so move the slider that matches the frequency indicator on the Gold Line unit to reduce the ring. If the sensitivity is set too high, many LEDs will light, making it difficult to know what frequency is ringing. If the sen-

ROAD TEST

MANUFACTURER: Gold Line, Box 500, West Redding, CT 06896. Tel: 203-938-2588.

APPLICATION: Feedback analyzer designed for use in live-sound situations.

SUMMARY: The FD-23 actually does help you detect feedback.

STRENGTHS: Self-contained; portable; easy to use.

WEAKNESSES: Eats up alkaline batteries very quickly; frequency analysis only extends to 12.5 kHz.

PRICE: \$259

EQ FREE LIT. #: 129

BY STEVE LA CERRA

Are there flies inside your speakers, or do you need a Furman Iso-Patch™?

Get rid of buzz and hum caused by ground loops
with the new Furman IP-8 and IP-2!



Furman IP-8 Isolated Patch Bay

The new IT-1220 provides any studio or stage with quiet, balanced power.

The Furman IT-1220 is a rack mount, 20 Amp Balanced Isolation Transformer designed to provide ultra-quiet power to an entire studio.

It can make your audio system dramatically less susceptible to hum pickup, with a typical 10 to 15 dB improvement in noise floor—a result often surpassing that obtainable from complicated star grounding schemes with heavy buss bars and ground rods.

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The back panel of the IT-1220 provides 12 isolated AC outlets for your equipment. The front panel provides two more, plus a three-color, 20-LED voltmeter.

Inside the IT-1220, a specially wound and shielded toroidal isolation transformer delivers perfectly balanced AC power—and very quiet performance from the equipment that's powered by it.

Find out how easy it is to produce with the sound of silence, with the Furman IT-1220.



IT-1220 20 Amp Balanced Isolation Transformer

You should get a buzz from creating music with your equipment, but not from the equipment.

Of course, any band or studio with a rack full of equipment can be plagued by buzz and hum.

Furman's new Iso-Patch series gives you a solution—by (temporarily or permanently) isolating your rack components from each other to break ground loops, and put an end to buzz and hum.

How does an Iso-Patch work? Simple. Each of its input/output module features a low-distortion isolation transformer, which isolates line level audio signals, breaks ground loops—and puts an end to those annoying noises.

The eight channel IP-8 Iso-Patch Isolated Patch Bay looks and works like an ordinary patch bay with standard, half-normalled 1/4" jacks. The IP-2 is a two-channel version, small enough to fit in any tool kit—and priced so low you can afford more than one.

See the new Iso-Patch series at your dealer today, or call, write or fax us for a free Iso-Patch data sheet and a copy of our catalog.



IP-2 Dual Isolator

FURMAN

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CIRCLE 94 ON FREE INFO CARD

WRN

sitivity is too low, you will not see any LEDs light.

Gold Line suggests that you keep the FD-23 at your house console position, turned on with the sensitivity adjusted so that some of the LEDs are barely lit (this is why you really need the power supply). If you begin to hear feedback, the display on the FD-23 will light an LED at the closest

offending frequency or frequencies. If you're quick on the draw for the EQ, you can kill the ring before it chases the audience out of the room. If you don't have the unit powered up during performance, you're doomed — the five-second turn-on delay can seem like a lifetime of ear abuse while you're waiting to analyze the situation. If you play by

the rules, the FD-23 actually does what it is supposed to in this application.

During our road test, EQ tortured this device and took it into an application where the FD-23 really excelled: using it to ring out a stage monitor system. You move to each monitor/mic (or sit in the drummer's seat) with the FD-23 powered up (thus the need for NiCads) and

have the monitor engineer bring the level up on the wedge. When you hear the monitor start to ring, watch the FD-23's display to see what frequency is ringing and then tell the monitor engineer to adjust the EQ for that monitor. This really beats guessing what frequency is ringing and is also a lot better on your ears than letting the monitor guy bring EQ sliders up to exaggerate the ring in an effort to find it. Since the FD-23 is so portable and self-contained, you don't have to drag an AC cable, measurement mic, stand, and an analyzer up to the stage.

Beyond its usefulness as a monitor analysis tool, the FD-23 can help you in situations even where feedback is not actually happening. If you are mixing house and hear a frequency that is building up (but not necessarily feeding back), the FD-23 shows you that frequency by the LED most brightly lit. Then use the graphic in your house-drive rack to reduce the buildup. This can be really convenient when mixing in rooms where the console is located in a spot where the bass builds up. Since the FD-23's display only runs up to 12.5 kHz, analyzing frequencies in the top octave will be left up to your experienced ear, but including those extra bands would put the cost of the unit over the top.

If you plan to take the FD-23 on the road, Gold Line offers a padded case for an extra 12 bucks. The FD-23's case is made of a material called Cycollac, which, I'm told, is nearly indestructible. While the FD-23 will not replace your \$2000 spectrum analyzer — and it isn't designed to — it does give you accurate frequency analysis in a compact, easy to use, *portable* package. Check it out. **EQ**



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BABY
ABOUT BAD
SERVICE.
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GROW UP
AND PAY
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CIRCLE 87 ON FREE INFO CARD

EQ On The Strip

How to understand
and use your studio
and live-sound
console's equalization
functions better

BY WADE MCGREGOR

What form of EQ is best for your application: fixed frequency, semiparametric, or fully-parametric? Should it also include low-pass and high-pass filters? Should there be an EQ bypass switch?

The mixing console input EQ should suit your situation and skill level. If you find the difference between 300 Hz and 3 kHz to be confusing, then having to select the center frequency of an EQ band may be intimidating. Entry-level mixers often provide a simple 3-band fixed EQ for exactly this reason. A 3-band EQ is simple to use and may in fact sound better than a more sophisticated equalizer for two reasons. First, the console designers can be more careful in the selection of components as they only need to suit a single frequency per control. Second, mixers are less likely to go as far wrong in misapplication of the EQ. However, if you know your way around Qs and Hz and you must have exact control over the EQ range, then you may demand the control that a parametric equalizer can offer.

There are a number of basic types of filters used for EQs in mixers: shelving, peaking, notch, high-pass and low-pass. Each of these filters performs a different function (see fig. 1) and can be used in combination to create almost any frequency response you could require. It is rare, though, to have them all on every input except in the most expensive consoles.

SHELVING FILTER FACTS

- Affect every frequency beyond the turnover point of the filter
- A high-frequency shelf filter will affect the upper harmonics of an instrument without altering the fundamental frequencies
- Remove low-frequencies from cymbal microphones
- Low- and-high frequency filters in console EQ are most often shelving filters

PEAKING FILTER FACTS

- Handy for reducing a single section of the frequency band
- Good for reducing excessive sibilance in a voice, loud notes in a bass, or overtones in a drum

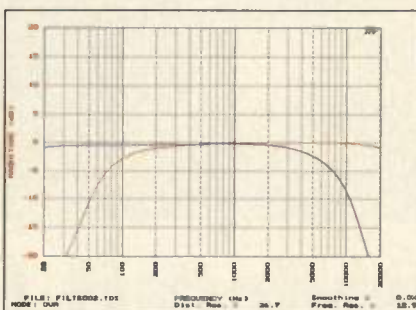


FIGURE 1A

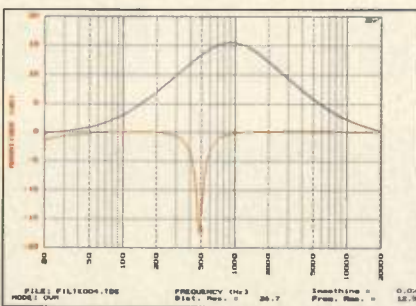


FIGURE 1B

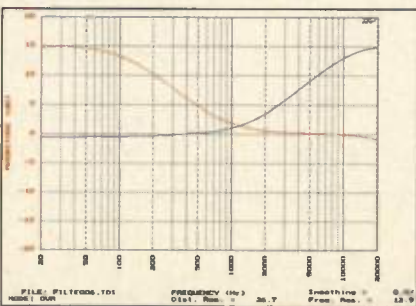


FIGURE 1C

- A very specific tool for tonal adjustment, but...

- Less suited for more overall shaping of the sound unless low-Q (wide bandwidth)

NOTCH FILTER FACTS

- The great problem solver, commonly providing up to 48 dB of attenuation
- Must be accurately set and since some sounds drift in frequency, may require retuning
- Removes clock whine from old samplers and synths
- Best approach to kill feedback frequencies

HIGH-PASS FACTS

- Cuts the audio signals below the cut-off frequency
- Typically 12 to 24 dB/octave
- Usually fixed frequency between 75 Hz and 160 Hz
- Variable versions can be used to tune to just below the frequency that produces a negative effect (too thin) on the instrument or voice
- Can reduce wind noise, breath noise, foot falls and other rumbles
- Better than using the shelving EQ for ensuring that destructive subsonic frequencies don't get to your loudspeakers

High-pass filters add a certain amount of phase-shift to the audio signal, but they remove noise at subsonic frequencies that can rob recordings of headroom and sound-reinforcement systems of amplifier power. Use the high-pass filter on every input that doesn't have any significant low-frequency content except when you have total control over the conditions at the microphone.

LOW-PASS FACTS

- Cuts the frequencies *above* the cutoff frequency
- Less common on mixer inputs, but often found on outboard graphic and parametric EQs
- Typically 12 to 48 dB/octave
- Usually variable in frequency between 12 kHz and 30 kHz
- Protects sound system high-frequency drivers and/or A/D converters from RF energy picked up in microphone cables

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Vari Air™: A variable Air Band™ equalizer that varies the gain and frequencies at five selected bands: 2.5Khz; 5Khz; 10Khz; 20Khz; and 40Khz; providing a boost only shelf at the selected band pass.

A B COMPARISON: When compared with other preamps, sounds recorded with the PreQ3 jump out of the mix. The real effect will be realized in the final mix!

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The PreQ3 was designed for high end recording, however, the pricing has made it possible for everyone to benefit from this new technology.

FINALLY, a world class mic/pre at a price everyone can afford.

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- Reduces high-frequency noise such as hiss from wide-open microphone preamps

- Reduces the transients in signals, making the sound more mellow and less present.

High-pass and low-pass filters take their name from the frequencies they *don't* affect. This makes the name confusing at first. A high-pass filter passes the high frequencies and reduces the low frequencies. Conversely, a low-pass filter passes the low frequencies and reduces the high frequencies. The names are based in

electrical engineering and not sound mixing. For this reason a high-pass filter is sometimes simply called a low-cut filter!

TWISTING THE KNOBS

The 2-, 3- or 4-band fixed frequency EQ is the fastest to set on the fly, but still requires a little thought to find the

WHICH EQ, WHEN?

Live-sound systems include a series of equalizers: in the input strip; in the group or master outputs; the system equalizer (between the mixer and the amplifiers or the stage monitor equalizer). Each of these EQs has a specific purpose. When you have problems with the sound, which EQ should you turn to?

The Input EQ is best for the following purposes:

- Adjusting the tone of an instrument to remove resonances or make it cut through the mix
- Adjusting the tone of a vocal microphone, perhaps to add a little edge to a vocal or to remove excessive sibilance
- Remove extraneous noise in a microphone, such as rumble from wind, breath, handling, or leakage from other instruments playing in other frequency bands (e.g., removing cymbals from the kick-drum channel)
- Creating a special effect, such as the GIANT TOM sound

If the strip EQ cannot tune in on a specific problem, the input EQ can be supplemented by a parametric equalizer patched into the channel insert. Examine your channel EQ; if you find you have made the same equalization setting across an entire group of channels, for example, cutting 2.5 kHz on all the guitar inputs, then perhaps you should change that to a single setting on the Group EQ. This may require you to create subgroups that suit your equalization needs as well as your mixing requirements.

The Group EQ is best for the following purposes:

- Changing the overall quality of a group of instruments or vocals, such as making the background vocals fit around the lead vocal
- Adding an overall sheen to a drum sound
- Ganging up EQ with the inputs to create extreme equalizations for an effect

What The Audience Hears

The System EQ is intended to create an overall response in the sound-reinforcement system that suits the particular performance. This should be the place where you make the changes to the system that best reflect the overall sound you are trying to create.

The System EQ is best for the following purposes:

- Tailoring the response to suit the abilities of the loudspeakers, such as removing extreme low frequencies when

you don't have huge subwoofers, or knocking out a little 4 kHz on a system that seems harsh

- Pulling back frequency bands that cause feedback

You cannot affect the sound of the room with system EQ, only the direct sound from the loudspeaker. If the room is boomy, you will be making the direct sound thin to compensate, but this will not lead to a balanced sound from the system, only a system as unbalanced (inversely) as the room.

System EQ should not be used to improve the sound of the lead vocal at the expense of all other instruments and vocals. If you can spare another EQ, then it should be inserted into the channel (or group) of the problematic vocal to modify the sound to suit your taste. If you don't do this, you may find that you are undoing the system EQ on every other input channel of the console.

What The Band Hears

The on-stage monitor system EQ is similar to the main system EQ. You want to make the monitor system sound as clear and natural as possible. There may, however, be situations where you must tailor the sound in the monitors to extreme tastes within the band or to unusual circumstances onstage.

The on-stage monitor EQ is best for:

- Creating a smooth, even frequency response from the loudspeakers
- Reducing problematic frequencies that resonate or cause feedback
- Making the sound cut through the blur of on-stage sounds
- Removing frequencies, such as extreme lows and highs, that may cause damage to the loudspeakers
- Filling in frequencies missing from the on-stage sound of the instruments

To EQ Or Not To EQ

Always consider the capability of the loudspeakers when applying EQ. Don't expect to boost 30 Hz until you get 120 dB of chest-thumping bass from a single 12-inch woofer placed 40 feet away. Equalization can never replace using the right microphone or loudspeaker in the right place, but it can enhance the quality of the sound and may even produce good sound in spite of less than ideal conditions.

—Wade McGregor

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WORKSHOP

right settings. You cannot tune these filters in on a sound, so you must consider what approach to take: additive or subtractive. When in doubt, always subtract ($-$ dB), because it will produce less noise, maintain the best headroom, and usually be more musical. If you have an acoustic guitar that sounds boomy, you can do two things: add more highs or reduce the lows.

With 3-band EQ, it is best to try reducing the low-frequency and a little of the mid-frequency to reduce the boomy quality. Simply reduce the level in those bands slowly until the sound clears up. You may have to raise the low-frequency after you cut the mid-frequency control to get the right balance. This can also improve the gain-before-feedback in live sound applications.

Semiparametric equalizers have become the most common input EQ on current mixing consoles. These EQs come in a couple of typical variations: fixed-frequency low and high bands with one or two mid-frequency bands; or all bands with variable frequency controls. By carefully tuning the peaking filter at a high boost ($+$ dB) and then setting the amount of cut ($-$ dB) to suit your needs, even these more complex EQs can be quick to setup. Sweeping the frequency control with the gain in that band boosted can sound real bad, but quickly points out the problem frequency. Don't do this at high monitoring levels, though, or you can damage the loudspeakers and even your hearing.

KNOWING WHEN TO BYPASS

EQ is just one of the many tools available to you within your mixing console. When things are going right, you may not even need any EQ on an instrument or voice. Always remember that you should start to fix any problem at the source, changing the microphone position or microphone type can produce far more dramatic results than any form of EQ. When you can't get what you need at the source, then EQ, but use it wisely.

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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TC Electronic M2000 Processor



MANUFACTURER: TC Electronic A/S, Grimhojvej 3, DK-8220 Brabrand, Denmark. Tel: +45 8626 2800; e-mail: tc@tcelectronic.com. U.S. Office: TC Electronic, 705-A Lakefield Road, Westlake Village, CA 91361. Tel: 805-373-1828; e-mail: tcus@tcelectronic.com. Web Site: <http://www.tcelectronic.com>.

APPLICATIONS: In-studio and live-sound effects processor.

SUMMARY: More versatile processing power from the makers of the M5000.

STRENGTHS: Easy to use right out of the box; Wizard function that lets you find the right preset; dynamic morphing; built-in 20-bit converters; sounds great.

WEAKNESSES: Nothing worth noting.

PRICE: \$1995

EQ FREE LIT. #: 130

HAS TC ELECTRONIC done it again, or is it just my imagination? After studio hits like the tc2290 and the M5000 processor, it seems like they have already outdone themselves. I know one engineer who wanted to sell his dog to get an M5000 for his project studio. Well, gather up Rover and head on down to your local TC Electronic dealer to check out the new twin-engine M2000 signal processor.

PHYSICAL

The M2000 is a one-rack-space device. Looking at the rear of the M2000, you will find gold-plated XLR connectors for the analog in and out, power switch, and AC cord receptacle on the left half of the unit, and XLR plus RCA jacks for the digital I/O, MIDI, and a footswitch jack on the other half.

On the front panel of the M2000, from left to right, there is a soft power switch, PCMCIA card slot for externally saving settings, level meters, LCD display that always shows what is going on in both engines, and control buttons grouped for Setup, Engine 1,

Engine 2, Combined 1+2, Snapshots, Control, and, finally, the Adjust knob for controlling parameter values.

The way the M2000 is set up, you are never more than one button press away from any parameter screen. Each front-panel button has two functions, the second function being accessed by pressing the Shift key before pressing the desired button. That's it. Out of the box to meaningful usage time of five to ten minutes — and if you read this review, you won't even need the manual.

ASSISTED OPERATION

Actually, the M2000 includes two major features that will keep the manual gathering dust on your bookshelf. Built-in Help will instantly brief you about functions in the current display. All you have to do is press Shift and then press I/O (which is also labeled Help for its shift function). If your buddy is not looking over your shoulder, he will think you actually read the manual.

Now for the best "manual-less" feature of the M2000: The on-board

Wizard. There is actually a very small person living inside the M2000, on call 24 hours per day, to help find a preset that matches your application. There is a separate Wizard key for Engine 1, Engine 2, and Combined 1+2 operations. If you are looking for nice reverb for vocals, call up the Wizard and select the ALGORITHM = REVERB; INSTRUMENT = VOCALS; and CATEGORY = GENTLE. The display will tell you how many different presets match your criteria, and let you try each one in order.

The Wizard criteria includes:

- Algorithms for Reverb, Delay, Chorus (including Flanging & Phasing), Pitch, Dynamic (compression/limiting/expanding/de-essing), and, of course, Misc.

- Instrument selection for Vocals, Guitars, Bass, Keyboards, Percussion, and Classic instruments (violins, flutes, etc.).

- Categories of effects that consist of Gentle, Normal, and Extra (which, I guess, is a hint that it is probably more effect than is legal in some states).

E.I.E. I/O

I have been pushing the E.I.E. I/O digital standard for farm implements for a few years now, but the industry has been slow to come around. The M2000 has failed to include this standard, but has seen fit to include all other analog and digital I/O configurations.

The physical input/output choices are:

- Analog is 20-bit (4-bit, 64 times oversampling), XLR Pin 2 Hot, greater than 105 dB dynamic range, selectable for consumer or professional levels.

- S/PDIF is RCA coax, also accepts EIAJ CP-340, IEC 958, up to 20-bit digital.





• AES/EBU is XLR, up to 24-bit digital.

I/O choices don't stop here. There is an I/O page that allows you to select analog or digital inputs, mono or stereo operation, sample rate, primary output connection, wet/dry mix for signal output, and output dither level.

I want to talk about the output dither level for a moment. If your primary output is analog, then it is wise to select 20 bits as the dither level because you have 20-bit converters. If your output destination is a DAT machine, then the dither level should be set to 16 bits because 16 bits is the maximum that can be stored on a DAT tape. If you have a multimedia device that will accept 8-bit digital audio, then your highest fidelity will be at the 8-bit dithered level. If you set the bit level higher than that acceptable to the receiving device, then the digital audio is truncated at the receiver's bit level with no advantages gained from the dithering operation. Because of the way bits are used in consumer format S/PDIF, 20 bits is the maximum resolution, but when there are consumer 20-bit devices, then you will be ready.

If you are connected to an AES device, then you can exchange digital information up to 24-bit resolution. Remember, that if you are connected to a 16-bit device, then you are only using 16 bits of the information, and any dither setting other than 16-bit will be wasted. There are, however places where you can use 18-bit, 20-bit, 22-bit and 24-bit information.

Uses for other than 16-bit resolution are:

- Recording to 20-bit or 24-bit optical disc recorders such as the Sony PCM-9000.
- Recording 20-bit or 24-bit through a Rane PaqRat to a TASCAM DA-88 or ADAT.
- Using external 20-bit converters like the Apogee D/A 1000, or other high-res. converters.
- Recording 24-bit information on the new Studer or Sony 48-track digital recorders that accept 24-bit digital signals.
- When connecting to another digital processor that will accept 20-bit or 24-bit signals, like another M2000 or an M5000.

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- Selecting 18-bit when the external converter is an Apogee D/A 500.

- When connected to a digital console such as the Yamaha 02R, AT&T DisQ, or Sony APX-R3 digital console.

- When the destination is Digidesign Pro Master 20 and storage is selected as 20-bit.

Remember, every time you process a digital signal, you add some low-level distortion and noise. If you are connecting multiple digital signal processors, then maintaining 24-bit signal routing until the very end will ensure the highest quality in the final output.

ROUTING OPTIONS

The M2000 includes extensive internal routing paths between the two mono In/stereo Out DSP engines. The routing choices are:

- **Serial:** Stereo In/Out when you want the signal to pass through one effect before passing through a second effect.

- **Parallel:** Both engines will work as stereo effects, and their outputs will be mixed together. A mono input will be processed and exit as a stereo effect.

- **Dual Input:** Dual-mono input with a stereo mixed output, allowing you to get two separate effects from separate sends with stereo return.

- **Dual Mono:** Left is always Engine 1 and Right is always Engine 2. Mono in, mono out.

- **Stereo:** The two engines link together to perform true stereo operations. Left and right audio paths are completely separate, but control parameters are copied from one to the other.

- **Preset Glide:** The M2000 will perform preset changes by crossfading from the current effect to the new preset. This would allow a Delay to keep repeating while a Chorus effect is fading in.

OTHER COOL FEATURES

- **Tap:** There is a button on the front panel that you can tap while the M2000 learns the tempo. You can then select the note value of the tap sub division and the millisecond value will be automatically calculated.

- **MIDI Monitor:** Allows you to monitor all MIDI activity received by the M2000. All note, program, control, and sys ex on each channel.

- **Tuner:** A built-in guitar tuner that will show you the detected note and whether you are sharp or flat.

- **Memory Card (64k):** You can store the entire machine on a memory card. When you plug your memory card into someone else's M2000, the machine boots from your card and the M2000 acts as though it is your M2000, completely ignoring the resident presets (unless you want to).

- **Editing:** All of the parameters of each effect can be modified to suit your needs.

- **Security:** You can program in a PIN number to keep your kid brother from changing things.

THE COOLEST FEATURE

Dynamic Morphing: Let's say that you have a vocal track that has a nice, soft, sexy vocal during the verses and then explodes into a Janis Joplinesque chorus. The best-sounding reverb during the verse is long predelay with de-essing and a long reverb time. If the chorus vocal hit, it would probably sound like a building collapsing. With the M2000, you can set up the reverb you like for the soft vocals, set up a completely different reverb for the chorus vocals, and the M2000 will seamlessly morph between them depending on the level of the signal. The coolest part of the transition is that the long reverb from the verse hangs over just the right amount. It sounds like you have the vocal on two different tracks, each with its own reverb settings.

YEAH, BUT HOW DOES IT SOUND?

I knew we would have to get to that part sooner or later. After the Roger Nichols "Hammer and Chisel" test, the overall impression was 5 Stars.

The setup for the test was as follows:

First was the frequency response and signal-to-noise test, analog in and out, with the Meyer SIM machine. Flat as a ruler, matching the spec sheet +0, -2 dB, 10 Hz to 20 kHz, better than 96 dB S/N.

continued on page 124

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W91

Aardvark Aardscape



MANUFACTURER: Aardvark, 202 East Washington, Suite 306, Ann Arbor, MI 48104. Tel: 313-665-8899.

APPLICATION: Processes sounds to make them sound as if they were recorded on analog tape, as well as provides other distortion effects.

SUMMARY: The Aardscape comes real close to analog tape distortion, but getting the sound optimized for different signal sources requires experimentation.

STRENGTHS: Simulates tape distortion accurately but is flexible enough to create several different families of distortion effects; can enhance some sounds, make them stand out, and add punch; compact.

WEAKNESSES: Comparatively costly; nonintuitive tweaking process; difficult to service.

PRICE: \$695

EQ FREE LIT. #: 131

NOW THAT WE have crystal-clear digital recording, people want to make it warm and fuzzy, just like the analog gear they sold to go digital. To satisfy the ever-changing desires of a fickle public, we've seen tube boxes, saturators, warmers, and a host of other devices that supposedly make digital sounds more "analog."

The half-rack Aardscape is the latest product in this category, but it does things a little differently. First, it's solid-state, not tube-based. Second, it provides a significant amount of control, not just a one-size-fits all "warmer" effect. And, finally, while it's designed to simulate analog sounds, it can also produce variations on this theme that range from pseudo-hard

limiting to strange kinds of "distortion" compression. All in all, it's an interesting box; let's dig deeper.

SHAPES OF THINGS

The rear panel has both balanced XLR and 1/4-inch phone unbalanced ins and outs. The outs are available simultaneously, while a selector switch chooses between the inputs. Also on the back: a barrel jack for the 16.5-volt wall wart.

The front panel has a bypass switch, power switch, input level control with 9-step LED meter, "warmth" knob, "drive" (output level) knob, and two three-position switches. The "brilliance" switch offers full, clean, and bright positions; the "saturation"

switch chooses among soft, medium, and hard. The controls are detented, which helps a lot if you want to dial in identical settings on two units processing stereo material.

USING AND ABUSING

I've always been ambivalent about analog tape distortion, because sometimes it would enhance a sound and sometimes detract. This box works the same way, although, of course, unlike tape distortion, there's a bypass switch if things don't work out, and you're not limited solely to tape distortion effects.

With analog tape, simply changing the input level alters a complex array of variables. With the Aardscape, it's necessary to consciously change each variable, so tweaking is crucial because the results aren't always intuitive. Granted, there's a limited number of controls, but there are still a lot of possible combinations of settings.

On sampled drums, the Aardscape can give that unmistakable "soft punch" you get with analog tape (I used the "soft" saturation setting and brilliance set to "full"); with the "hard" saturation setting, it definitely sounds like the meters are pinning on a tape recorder running Ampex 456. But settings that work wonderfully on rock drums can sound murky on jazz voice,





settings that sound just fine on jazz voice don't always work on keyboards (but just a slight change can make keyboards come alive), and so on.

With electric guitar I never did arrive at any setting that I really liked — just about any multieffects in my rack produced more pleasing distortion options. However, with acoustic guitar the Aardscape was able to give a pleasant, subtle sort of "lift" to the track. What all this means is that the Aardscape has a learning curve, and it may take you a while to figure out what settings work best with various sound sources.

Because a sound is worth a thousand words, there are downloadable WAV and AIFF examples in my AOL site (keyword SSS > EQ Online > Review Unit Demos). The first example uses drums (bypassed, then set for optimum punch, and finally over-the-top distortion). The second example uses program material, where the added distortion sounds like — well, like recording the song on my TASCAM Model 32 analog deck with the meters going a bit into the red.

The Aardscape's heart is contained in a potted module, so if it ever blows up and Aardvark isn't in business, you're in trouble. Having said that, the peripheral circuitry is well-constructed, so hopefully reliability will not be an issue; and Aardvark has been around for seven years, so they're not just some new company (although they are new to the digital audio world).

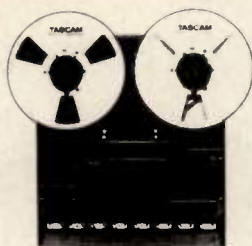
THE BOTTOM LINE

Although it provides several different types of distortion effects, many people will probably be interested primarily in tape distortion. If that's all you want, then, at \$1190 for stereo processing, you have to wonder if there aren't more cost-effective alternatives to achieve not necessarily the same sound, but nonetheless impart a warm and fuzzy feel to digital sound sources. (For example, the Peavey VMP-2, reviewed in the June '95 issue, can warm up tracks, but it's also an excellent tube mic preamp, lists for

continued on page 126

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Sytek MPX-4A Mic Preamp



MANUFACTURER: Sytek Audio Systems, 2424 W. Irving Park Rd., Chicago, IL 60618. Tel: 312-588-4477.

APPLICATION: Amplify up to four microphones simultaneously and feed balanced, XLR inputs.

SUMMARY: There's more than life to tubes, and this is a very high-quality and low-noise piece of gear.

STRENGTHS: Excellent overall specs, particularly in noise, frequency response, and phase linearity; clean, open, detailed sound; toroidal power transformer and internal power supply; manual includes schematics.

WEAKNESSES: Gain knob not calibrated; dual-color LED would be nice to indicate clipping as well as pre-clip.

PRICE: \$1480

EQ FREE LIT. #: 132

ALTHOUGH THE BIG buzz is for tube gear feeding output transformers to get that "creamy," vintage mic preamp sound, there are times when what you really want is the cleanest, most detailed sound possible. Solid-state has a good reputation for clarity, but unless there's a great deal of care taken in the design, a certain brittleness can result.

Sytek's quad mic pre is state-of-the-art solid state. It's based on Class A amplification topology, which draws more current than the average design, but makes crossover distortion a non-issue. Rather than being all-IC or all-discrete, the MPX-4A uses matched transistors as a front end, with ICs handling the more mundane gain-changing and balancing chores. The output stages are 5532's — not exactly the hippest ICs around, but they're not being asked to work very hard either; they're essentially line drivers for the XLR outs and have nothing to do with the initial preamplification.

MAKING THE CONNECTIONS

The MPX-4A is spartan in its simplicity: the rear panel of this 1U rack unit

has four XLR ins and four XLR outs, as well as the receptacle for an IEC standard AC cable. The front panel is separated into four sections (one per pre-amp), each with a gain control (up to +65 dB max), peak LED that lights when the signal is 8 dB below clipping, and three pushbutton switches for mute, phase reverse, and 48-volt phantom-power enable. The on/off switch is also on the front panel.

LOOKING INSIDE

The power supply has a hefty toroidal transformer and uses discrete parts instead of three-terminal regulators. Shielding is well-implemented (no doubt a contributing factor to the extremely low equivalent noise figure of -129 dB with a 150-ohm source impedance); the circuit board is essentially one big ground plane. All ICs are socketed, and the resistors are high-quality metal-film types. The unit appears to be hand-wired, giving a custom feel to what is obviously not a mass-market product, but designed to appeal more to mic preamp connoisseurs.

Aside from frequency response, which extends from 10 Hz to 85 kHz (± 0.25 dB), testing the specs was not possible since they fall beyond the range of my test equipment. Quoted signal-to-noise ratio exceeds 100 dB, phase linearity is within 0.1 degrees from 10 Hz to 20 kHz, THD is (noise) -0.0015 percent at 60 dB gain, and the common-mode rejection ratio exceeds 100 dB at 100 Hz. Translation: These specs are very good, and they're obtained not just by circuit design, but also by proper component and PC board layout.

THE SOUND

Plug a mic in, and what you hear is what you get — this is the proverbial straight wire with gain. In comparison with less-expensive mic preamps, the biggest difference is a highly open quality and "definition" that offers a great deal of sonic finesse...the sound is extremely "focused," with lots of detail. And although conventional wisdom says you need a tube for warmth, the sound is so free of the brittleness and tiny distortions associated with solid-state gear that it has its own kind of warmth.

Overall, this is quite a unit. At \$370 per preamp it's not cheap, but it's not outrageous either considering what you get. I'm sure not everyone will need four mic pres in a box, but for miking drums, multiple vocalists on stage, picking up ambience (something that's viable with a low-noise unit like this), and other multi-mic applications, the MPX-4A delivers. It may not have tubes and transformers, but if you want a classy unit with a transparent sound that's built to transcend the sound *du jour*, this is a well-crafted solid-state unit that deserves a long, hard look. —Craig Anderton



LOU REED

continued from page 78

sound of the pick is heard through the entire record — a perfect added percussion track right off the bat. And that's something I've been doing since an album I made called *Coney Island Baby* where I used to mic the electric guitar; a mic in front of the guitar to just pick up the picking. We didn't have to do that because the Manley picked it up anyway. It's so amazing how things sound when you put them together. On "Finish Line," you'd swear there's a jew's-harp at the beginning.

Steve: We were looking for it, but it wasn't on the tape.

Lou: It got to the point where we went out and got a jew's-harp. I thought, since we hear it maybe we can define it better by actually playing it, but none of us could play it and we were saying, "Who do you know that plays jew's-harp?" Then we said, "Oh forget it."

Bob: You could look at your 802 [local musician's union] book.

Lou: We finally figured out which instrument it was — it was the high end of the bass, I think *in* with the electric guitars. When they blended together, a fourth sound came out that separated. There's like this fourth force! Well it's there, leave it alone. We got a guy playing the jew's-harp in there...great!

Bob: How much guitar layering was there on the album? Every guitar sound on the album is you?

Lou: Yes

Steve: Not a lot of layering, though. The thing was, we did a lot of stereo guitar recording. I recorded a lot of the amps in stereo. So they sound bigger and they're very real sounding.

Lou: "Egg Cream" sounds like it's more than one guitar, but it's just one guitar and seven mics! People have said to me, who is playing the other two guitars! It's just one...

Bob: ...in real time!

Lou: Yeah! The most layering occurs at the very end of the album — that's four guitars at the end of "Twilight." That's the most.

Steve: When Lou wanted to play through his big giant cabinets — he has a really great Soldano and a Cornish cabinet — those guitars were done at the Magic Shop, 'cause he obviously would have been evicted! They were at somewhere around 150 dB.

MAINTENANCE

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REEL-MOTOR DRIVE AMPLIFIERS

The following information applies to all MCI models except the JH-10 and JH-100, which used AC reel motors. The Ampex MM-1000 and MM-1200 also used AC reel motors as did the Studer A-80, the 3M M-56, and the Soundcraft 700 series. Nearly all other machines use DC reel motors.

The most common reel-motor circuit failure results from either too little or too much tension. This can be due to a pass-transistor failure. If the transistor is shorted, the reel motor will spin at full power as if in Fast Wind mode, even without tape to interrupt the photo sensor. If the transistor is open, the reel motor will not turn at all.

The transistors in question are easily accessed in the left side power supply (one of two located at the rear of the machine). Remove the power supply "chimney" by turning the four thumb screws near the fan. In the "wind tunnel" of the chimney are four transistors mounted on heat sinks. These are connected to the reel motor drive board via four, three-pin Molex connectors (P4 and P5 are for the supply motor; P6 & P7 are for the take-up motor).

Swapping these connectors in pairs will move the problem to the opposite motor. If so, pull out the black-finned heat sinks and change both of the 2N3055H pass transistors. (The "H" suffix indicates a high-performance version. Any 2N3055 will work, but not for as long.)

If the problem does not move to the other reel motor, check the current limiting resistor on the reel motor drive board. This is a square, white-ish power resistor (as shown in the March '96 maintenance column). It has a very low resistance (.39 ohms), so a high reading on a VOM meter means it's "open," and should be changed.

Glenn Coleman is president of Coleman Audio in NY (516-334-7109). In addition to providing maintenance services, Coleman Audio also manufactures a line of audio accessories, including a cable testing box (model CA-7). Coleman Audio's e-mail address is: glennny@aol.com.

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EQ APRIL 123

APRES MIDI

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As far as the mixes were concerned, it reminded me of when I used to do live sound at The Stanhope House — a blues bar in northern New Jersey. The band picks up and starts playing and it's your job to make them sound as good as you can on the fly.

The functionality of the Euphonix console made this marathon recording session relatively smooth. With snapshots already arranged for various situations, it made the curve balls much

easier to deal with. I was prepared for so many different possibilities that it was hard for someone to think up a recording situation that I hadn't already thought of. The marathon ran from Monday through Saturday, and after it was all over I took five days off. And as for which band I liked the best...

Producer/composer Roy McDonald is chief engineer and director of technical services at Apres Midi. He has worked with Dr. John, Joe Lynn Turner, Phoebe Snow, and Ben E. King, to name a few.

TC ELECTRONIC

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Next, I fed an audio signal from a Sony SG-800 tube condenser mic (the one with the heat sink) through an Avalon (and then GML) mic preamp, into the 20-bit converters of the M2000. I compared the analog output from the M2000 with the digital output fed to my Apogee DA-1000 20-bit converters. The sources were an acoustic guitar and a vocal in a very quiet, ambience-neutral room. The results were amazing. I could easily hear the difference between mic preamps, which tells me that the resolution of the M2000 converters is right up there. All of the reverbs were very smooth and lacked any sign of graininess.

I tried the digital EQ and was very impressed. The sound quality was smooth and airy. The parameters did what they said they were doing. When I boosted 841.4 Hz by 1.7 dB, that is exactly what happened. The EQ is 5-band parametric. The high and low bands are shelving, while the center three bands are full range 20 Hz to 20 kHz at ± 12 dB in 0.1 dB steps.

I checked out everything: compressor settings, gates, limiters, de-essers, reverbs, choruses, phlangers, and phasers — even Bypass sounded good.

The reverbs were especially smooth. One good test for me is to stop the tape and listen to how the echo dies out. Another good test is to just listen to the wet signal by itself and see how intelligible the source still is. The M2000 passed both of these tests with flying colors.

CONCLUSION

The M2000 by no means replaces the M5000. The M2000 is more like the M5000's smart little brother. The M5000 has 3-band compression, the M2000 has single-band compression. The EQ in the M2000 has three different slopes for curve shaping, the M5000 has continuously variable "Q." The M2000, however, has Dynamic Morphing, built-in 20-bit converters, a much easier navigation system for menus, and is about one third the cost.

I don't see M5000 owners (including myself) getting mad, I see them getting a couple of M2000's to augment their M5000. The biggest trouble with good products like the M2000 is that if you like more than one of the features, one M2000 just isn't going to be enough. It's a good thing each M2000 only takes up one rack space. —Roger Nichols

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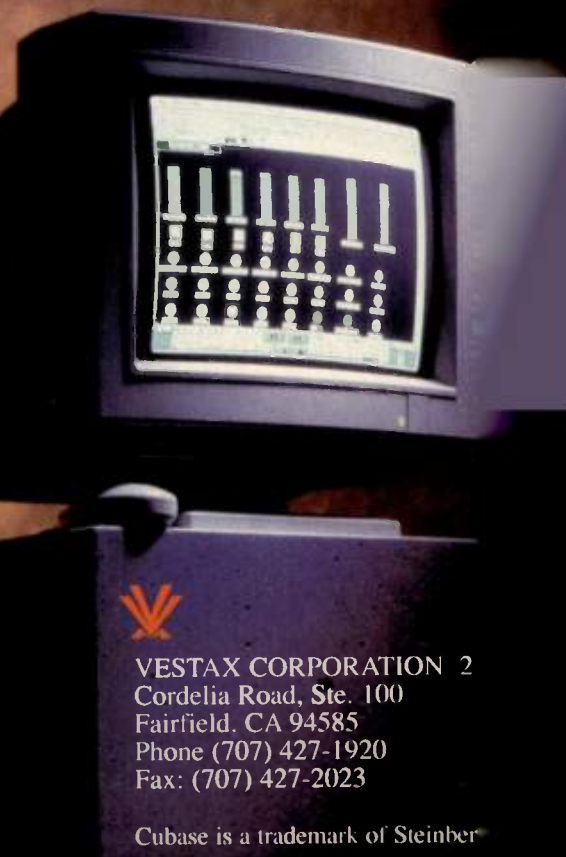
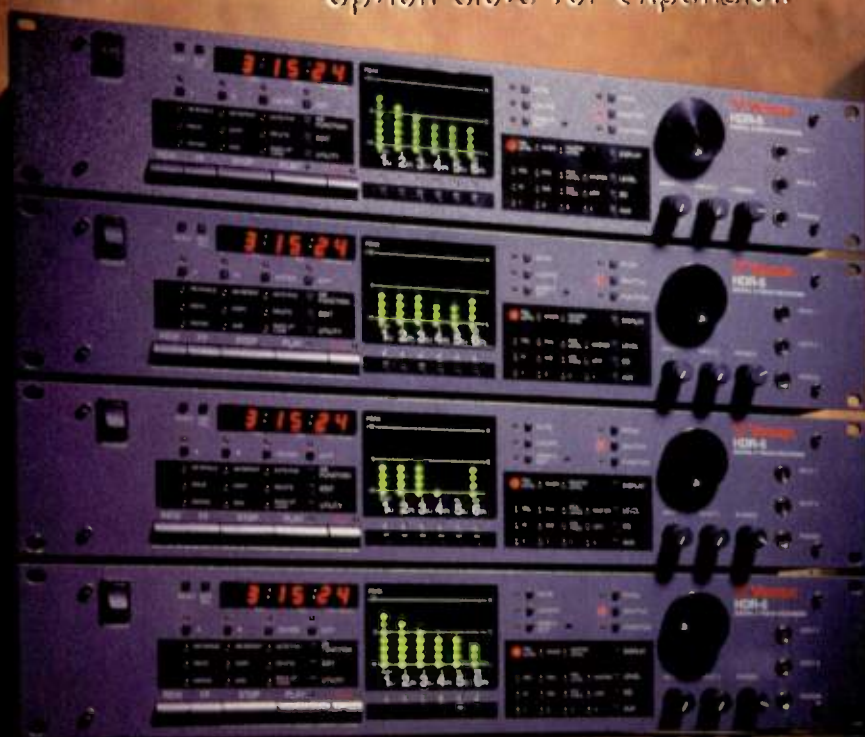
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AARDVARK REVIEW

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under a grand, and throws in good-sounding EQ.)

Another possible issue is that I feel many people have romanticized tape distortion to the point where they might be disappointed by something that accurately simulates it — consider how many engineers try to make tracks “more analog” by using tubes, which produce a different sound altogether. Some people, looking backward through the fuzzy glow of nostal-

gia, think of analog tape distortion as a panacea; it's not. It's a useful processor that works well in some applications but not in others.

Overall, Aardvark has accomplished what they set out to do, and the results are cool. If you generally like digital and just want to sweeten the occasional drum or vocal, you can probably get by with less costly alternatives. But if you're an analog tape sound fanatic who wants to experiment with other distortion effects as well, the Aardscape comes closer than anything else I've heard to analog tape saturation in a box.

—Craig Anderton

MINISTRY LIVE

continued from page 98

Archiving and programming the necessary loops and samples for the live show is also a very important part of preproduction for the band. As Barker explains, samplers have made it a little easier for the band to exercise more creative freedom. “Basically, over the years we've come to realize that because of sampler technology, we could get away without using tapes anymore. That was so liberating because we weren't locked into a track. So from that point on, we haven't used any tapes; we just do the loops and reduce the sample size to a minimum so we can load as much of the show in as possible and try and max out the RAM of our samplers. If we need more, then we'll have two samplers running concurrently. We just want to keep stuff to a minimum — to the most minimal thing we can get away with.

“Part of Ministry's signature sound is that the drum sound varies — sometimes dramatically — from track to track,” states Barker, “and we really feel we have to retain that in a live situation.” Their solution: ddrum triggers on drummer Rey Washam's miked acoustic set as well as DW trigger pedals connected to an Akai ME35T audio MIDI interface and an Akai S1000 sampler. This gives them the flexibility to use the acoustic kit for the newer songs, and the “MIDI-ized” ddrum hits for the older, more industrial sounding songs.

The band also takes the same approach when it comes to their keyboards. “We're using a Roland A30 controller,” explains Barker, “and it's great because it's totally disposable. We always have a back-up lying around. We just want to make sure that at any time during any song if something goes down, you can just swap it and the show goes on. That's what years of touring and doing it all yourself teaches you.

“Of course, you have to reach the point where you can afford it. At that point you want to make sure that your rigs aren't so extravagant so that you can in fact afford another one. That's sort of our live mentality. The A30 is coupled with a couple of Akai S3000 samplers. We have all the shows backed-up on disk, and that's about it. Everything else is just your standard rock ‘n’ roll guitar/bass kind of thing.”

So what can you expect from the band in terms of a show? Barker's working out he details right now: “I think this tour is going to be more of a somber, gloomy kind of partaking — in a fun kind of way.”



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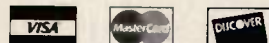
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Your Studio And The Internet

Do's and don'ts on surfing the 'Net

BY MARTIN POLON



No single topic is hotter in the offices and facilities of recording studios, postproduction facilities, Foley stages, studio equipment manufacturers, and audio dealers than that of the Internet. These and other similar businesses in audio use the Internet to communicate, research, advertise, and transfer information and data. As with all other technological innovations in and about audio, the personal and project (P&P) studio operators can participate in the various options offered on the "IWAY" in the same way as the big boys.

In fact, in a way, the Internet empowers the smaller studio operator and audio practitioner because on the Internet, everyone is equal! A display page on the Internet's World Wide Web (WWW) provided by the largest studio in New York City can be equaled or bettered by a Web page from a small P&P studio in La Jolla! Not to mention that the La Jolla studio can hook up an inexpensive color camera to a computer and continuously broadcast on the Web page. In January, this periodically updated view of sun and fun in Southern California on a flower-filled patio (with the Pacific ocean in the background) could sell more recording time than the most sophisticated Web page showing a state-of-the-art console in a New York City studio (reached by slog-through six feet of snow).

The following features of the Internet should be of interest to all studio operators.

1. World Wide Web (WWW) pages from various manufacturers allow tech support contact, provide information, catalogs, and product information.

2. File Transfer Protocol (FTP) will transfer from dedicated servers of software for studio computers, consoles, programmable signal processing equipment, etc. Equipment makers, computer providers such as Apple and Microsoft, and even dealers make software upgrades available for products already installed and in use in the studios.

3. Usenet News Groups (UNG), especially the ones dedicated to studio audio, professional audio, and related audio and video subjects, are very much like electronic magazines. The UNG may contain literally hundreds of topics and an equal number or greater number of comments on the topics. The newsgroups are a good place to see what experience other studio users have had with particular pieces of audio equipment.

4. E-Mail to dealers, equipment makers, and just about everyone anywhere who a studio owner/operator/manager might want to do business with. Many studio users find it much faster than traditional "snail mail." It can be a real time and cost saver for internal and external correspondence.

5. The ability to create World Wide Web "Home Pages" is well within the reach of any and every studio owner. New software application programs such as Adobe's Page Mill, or even state-of-the-art integrated applications such as Claris Works 4.0 can utilize HTML or Hyper Text Markup Language to create an attractive and utilitarian Web page that will advertise the studio and its services, plus provide links to other appropriate pages. Many businesses actually hire HTML professionals to create their Web pages and in some cases to maintain them on a dedicated server. Several of the largest online services such as CompuServe plan to offer storage and display of individual Web pages.

However, there are certain problems with Internet usage, primarily due to the Internet's relative adolescence as it becomes a major communications pathway for the entire planet.

You should deny unlimited access to the Internet at your facility. First, enable those computers in the studio that have a real need for access, while isolating them from internal networks, studio functions, and the like or use a "firewall" computer to filter all Internet access.

The reasons for Internet isolation actually begins with the cost of access. Many studio users of the Internet use a computer service provider such as America Online (AOL), CompuServe, E-World (from Apple Computer), Prodigy, etc. These services have excellent computer communications functionality (E-Mail), plus in several cases offer significant research and audio-related information areas. These providers also offer Internet access, but at the same rate as all of their other regular services and at the same fees — roughly three dollars per hour after a ten dollar per month charge with four or five free hours of usage. Any significant Internet usage quickly adds up to major monthly charges in the multihundred dollar range. Even the use of dedicated Internet servers still leaves a tariff in the range of one dollar per hour. So unlimited usage of the Internet in a studio shop with five or ten employees can cost lots.

Another reason for security in using the Internet is the presence of hackers who can cause terrible damage to any computer system they gain access to. The problems caused range from damaged hard drives to corruption of applications and stored files.

The bottom line with the Internet is that as a popular and commercial tool, it is just beginning to grow. It provides an enormous opportunity for studios to advertise their wares to the most techno-literate 25 percent of the population. The various other services available are just the frosting on the Internet cake.

EQ

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Not only do we have the best selection of the finest products in the entire music industry, but our prices are so affordable, you won't have to take a second job just to start making music!



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Got a question about a product you've purchased or are thinking about purchasing? Just give us a call! Whether you're a novice or a seasoned pro, our technical support team has the knowledge and experience to answer any question you might have. And no other dealer has anything like our huge, online product database that gives our staff instant access to technical information about thousands of products.

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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 autopacer automatically inserts 4 seconds of silence between songs or broadcast segments.
- Multi-function display clearly indicates transport mode, tape counter position, tape type and level indicator.
- Multi-counter with both tape counter and run-time modes.
- Independent L and R stereo level controls and master record level control.

Tascam 103 Advanced Features:

- 3-head system allows you to record on a tape and monitor it at the same time, without rewinding.
- MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction.

202 mkIII Dual Auto Reverse Cassette Deck



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

- Normal speed and high-speed dubbing.
- Autospacer automatically inserts 4 seconds of silence between songs or broadcast segments for pro quality tapes.
- Incorporates Dolby HX Pro sound technology to extend high frequency performance and minimize distortion on Normal, Metal and CrO2 tape.
- Allows you to quickly and easily create a professional-sounding composite tape from several sources. Functions like Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks you want.
- Twin two-head cassette decks in a durable rack-mount housing that can be used separately or in tandem during recording and playback for total flexibility.

- **Play** material on deck 1 while deck 2 records on one or both sides.
- **Record** simultaneously on both decks from an external master.
- **Play** back both sides of one or both decks in a continuous loop, up to five times.
- **Auto Reverse** automatically reverses tape direction during playback and record.

- **Repeat** rewinds tape and allows infinite looping during playback.
- **Time** switch for unattended record/playback (timer required).

New! 302 Double Auto Reverse Cassette Deck

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

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

CD-601 Professional CD Player



Frame-accurate cueing precision, extremely high-fidelity and a small form factor make the CD-601 ideal for post-production applications where sound effects and music are "torn-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	PMD-101	PMD-201	PMD-221	PMD-222	PMD-430
Stereo/Mono	Mono	Mono	Mono	Mono	Stereo
Heads	2	2	3	3	3
Inputs/Outputs					
Mic Input	1/4-Inch	Miniplug	Miniplug	MiniXLR	1/4-Inch
Condenser Mic	Built-In	Built-In	Built-In	Built-In	—
Remote Jack	—	Yes	Yes	Yes	—
Modular Tel. Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR	—	—	—	—	Yes
Mic Attenuation	—	0-10dB, -20dB	0-10dB, -20dB	0-10dB, -20dB	0-15dB, -30dB
Ambient Noise Cont.	—	Yes	Yes	Yes	—
MPX Filter	—	—	—	—	Yes
Manual Level Control	—	Yes	Yes	Yes	—
Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pitch Control	±20%	±20%	±20%	±20%	±6%
Bias Fine Adj.	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
Half-Speed Playback	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

Telex

ACC2000/4000 Series Cassette Duplicators

Designed for high-volume 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 wow and flutter, frequency response, signal-to-noise 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.



FingerTip Operation	Easy Maintenance:
• Individual rotary audio level controls allow for an increase or decrease of audio levels as the master translates to the copies.	• Stanted 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 pinch roller for convenient cleaning.
• Stop all tapes instantly, at any point during the copy or rewind cycle.	

ACC2000 Mono Master Module:

- 1/2 track, two-channel monaural duplicator produces 3 copies from a cassette master at 30ips (16X normal speed).
- Expands up to 27 copy positions by adding ACC2000 copy modules (four positions each).
- Erase heads in the copy positions automatically erase existing audio as new material is being recorded.
- Track select, short tape indicators, auto/manual operation.
- Includes removable power cord and protective dust cover.

ACC2000 XL Mono Master Module:

- Same features as ACC2000, plus—Extended Life cassette heads.
- **ACC4000 Stereo Master Module:**
- 1/4 track, four-channel stereo duplicator. Same features as ACC2000 Mono Master Module.
- **ACC4000 XL Stereo Master Module:**
- All features as ACC4000, plus—Extended Life cassette heads. Can be configured for chrome or ferric cassette duplication.

ACC2000 Mono Copy Module:

- 1/2 track, two-channel monaural copy module.
- Each module has four copy positions with erase heads and controls for side select.
- LED displays indicate end-of-tape status for each pocket.
- Includes ribbon cables for connection to ACC2000 master and other copy modules.
- Includes removable power cord and protective dust cover.

ACC2000 XL Mono Copy Module:

- Same features as ACC2000 Copy Module, plus—Extended Life cassette heads. Connects to ACC2000 XL Master Module.
- **ACC4000 Stereo Copy Module:**
- 1/4 track, four-channel copy module. Has all the features of the ACC2000 Copy Module.
- **ACC4000 XL Stereo Copy Module:**
- Same as the ACC4000 Copy Module, plus—Extended Life heads. Configurable for chrome or ferric cassette duplication.

Copyette EH Series Duplicators

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

Stereo Copyette 1+2+1

Weighing only 8 lbs. (3.6 kg), this unit has a durable, impact resistant housing and includes a removable power cord, carrying handle and protective cover. It also has an optical, non-reflective end-of-tape sensing system that provides gentle tape handling. A mono version is also available.

Stereo Copyette 1+2+3

This duplicator copies both sides of three cassettes at once, yet it's as small as the 1+2+1. It weighs only 12 pounds (5.4 kg) and includes a hard cover to protect the unit while not in use. It uses all DC Servo motors for the ultimate in reliability. A mono

TASCAM 112 mkII Stereo Cassette Deck



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

- Utilizes Dolby B or C noise reduction with Dolby HX Pro
- Automatically selects proper bias type, so you get optimal recording & playback response with Normal, Metal or CrO2 tape.
- Gear independent input dials let you dial in stereo VU calibration with one dial. You can also adjust for channel specific calibration.
- Offers two Autolocator buttons and a MEMO IN control. These controls allow you to select two points on any tape for one button forward/reverse to wherever the action is. Additionally RTZ (return to zero) quickly spools the tape back to 0000 on the tape counter.
- Rear-mounted RCA input/output jacks for easy connection to high-quality sources
- Optional LA-112 connector provides additional balanced or unbalanced XLR inputs and outputs. Installation is simple and requires no special tools.
- 25-pin D sub connector (parallel port) on the back, links the deck to the optional RC-134 remote control unit or for fader 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 mkII virtually eliminates wow and flutter. HTSC is an advanced servo control system that maintains consistent back tension on the tape all through the reel, combating inconsistencies brought on by extreme temperatures and humidity.
- Super Accuflex Rotating Head System allows recording or playback tape direction to be changed with one button. A single-screw azimuth adjustment makes it easy to maintain the head alignment after many hours of continuous use.
- For unattended record/playback of material that is longer than one side of a tape, there are two features that spare you from constantly attending to the deck:
 - Auto Reverse mode plays or records in both directions before stopping, switching sides on the fly.
 - Continuous Reverse mode allows you to loop the tape during layback up to 5 times, or record in both directions, without pausing to flip the tape and re-engage the record mechanism. Both features are accessible from the front panel, with one-button selection.

122R mkIII 3-Head Stereo Cassette Deck



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

- All the features of the 112R mkII (no reverse of course) plus—
- XLR balanced and unbalanced RCA inputs and outputs are selectable with the flip of a back-panel switch. There are 1/4-inch inputs on the front panel for simple and direct plug-in of line-level gear

- MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction
- Bias and level fine tuning for each channel. These tuners can be used in conjunction with the one-touch 400 Hz or 10 kHz oscillator adjustment signals to get proper VU calibration before or during each recording session.
- Record/mute autopacer automatically inserts 4 sec. of silence between songs or broadcast segments for pro quality tapes

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MDX 1200 Autocom

- Attack and release times, with Intelligent Program Detection, prevents common adjustment errors.
- Newly-developed, powerful noise gate.
- Switchable soft knee/hard knee characteristics for varied sound pressure levels.
- Bright, illuminated LEDs show gain reduction.

MDX 2100 Composer

- Integrated auto/manual compressor, expander & peak limiter.
- Compresses "musically" in dynamic range without any audible "pumping" or "breathing".
- Attack & release times are controlled automatically or manually.
- Interactive Gain Control (IGC) combines a clipper and peak limiter for distortion-free limitation on signal peaks.
- Servo-balanced inputs and outputs are switchable between +4dB and -10dB.

ALESIS

3630 Compressor

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

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

t.c.electronic

Wizard M2000

Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and six different routing modes. There are 250 factory programs including reverb, pitch delay, delay, chorus, flange, phaser, ambience, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit analog conversion, AES/EBU and S/PDIF digital inputs/outputs, "Wizard" help menus, 16-bit dithering tools. Tap and MIDI tempo modes and single page parameter editing.

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

Symetrix

601

Digital Voice Processor



- Accepts mic or line level analog signals, converts them to 18-bit digital and then performs 24-bit digital domain signal processing.
- Processing includes fully parametric shelving EQ, notch/dynamic filtering de-essing, delay, chorus, gating, expansion, compression, AGC and DC removal.
- Combination of 128 factory presets and 128 non-volatile user programs.

- Has XLR-balanced mic and line inputs, XLR-balanced stereo output, Digital XLR-balanced and S/PDIF (RCA) inputs and outputs. MIDI input/output supports connection to virtually any type of MIDI control device for programming or controlling the 601 in real time.
- Ideal for a variety of recording, broadcast, live sound, and post production applications.

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Fostex

XR-5/XR-7 Multitrackers

XR-5 Features:

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

- MIDI/TAPE multi-mix mode supports MIDI synchronization
- Together with the Alternate Mix mode the XR-5 can simultaneously mix all MIDI sound source output with playback sound and effect output while monitoring!



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

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

TASCAM

PORTA 03 mkII Ministudio

The easiest way to get into multitrack recording, the PORTA 03 is an extremely economical 4-track recorder that lets you overdub as well as middown 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 sent to LINE OUT for stereo midown
- Track selector indicates which of the 4 tracks you're recording to

- SAFE selection keeps you from inadvertently recording over tracks you've recorded earlier
- Headphone jack for comfortable monitoring
- RCA output jacks for middown to cassette



PORTA 07 Ministudio

The PORTA 07 packs high-end features into a compact and economical package. Achieves great sound with high speed tape transport, high-low EQ and DBX noise reduction.

- 4-track recorder with integrated four channel mixer
- Two 1/4-inch LINE inputs and two 1/4-inch MIC/LINE inputs with trim control
- Separate high and low EQ for each track provides 10dB of boost or cut
- dbx noise reduction for improved signal-to-noise ratio
- Punch-in/out, manually or with optional RC-30 footswitch.
- Effects send with stereo return can be applied in varying amounts to all four channels

- "Bounce or 'ping pong'" a submix of multiple mono or stereo tracks onto a single empty track, leaving the original submix tracks free to overdub new material onto. You can even add a "live" track to the submix while you're bouncing down, to squeeze in yet another track.



424 mkII Portastudio

The 424 is premium Portastudio that takes multitrack recording to the next level. Features superior audio quality, balanced XLR inputs, enhanced equalization and a built-in studio style AUX section.

- All the features of the PORTA 07 plus—
- 4-track recorder with 8-input mixer (4 mono MIC/LINE inputs with 1/4-inch and balanced XLR jacks and 2 stereo inputs with 1/4" jacks)
- Separate 3-band EQ section for each of the four mono channels with 10dB of boost or cut and sweepable midrange
- Auto Punch in/out with rehearsal, plus a Repeat switch lets you set up a tape loop that goes over the same area of a tape while you practice your punch-in/out and overdub moves—without committing a single note to tape
- Two independent dedicated AUX sends let you use more effects or use one as tape cue during tracking

- Dual-speeds, logic-controlled tape transport system improves tape handling and sound quality. Select 3-3/4 inch per second HIGH speed for the best possible recording quality or NORMAL 1-7/8 ips speed.
- Monitor output makes it easy to connect an external monitor amplifier without repatching—at middown.
- Tape DIRECT OUTS are provided for integration with external mixers.



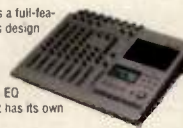
MIDI Musicians Take Note!—If you've got MIDI keyboards, drum machines and sound modules in your set up, you can exploit the power of "virtual tracking" with either the PORTA 07 or 424/464/488 Portastudio. You can use a MIDI synchronizer like the Tascam MTS-30 MIDI-Tape Synchronizer to record (strip) 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 until final middown, 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 middown.

- 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 localizing 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.
- Woofer blends seamlessly with the 3" polyimide soft dome ferrofluid 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 media for minimal resonance and features an anti-diffraction radially slanted front baffle design.

PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" lowfrequency driver and 3/4" tweeter are fed by a completely redesigned handwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radially slanted 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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CARVER

CA-400/CA-900 Stereo Power Amplifiers

Designed from the ground up for fixed installation applications, the CA-400 and CA-900 are manufactured under the most stringent quality control procedures and are backed up with a full five year warranty covering all parts and labor.

- 3-position barrier strip screw terminal inputs can be used with balanced or unbalanced lines
 - Independent CH 1 & CH 2 level controls with 11 detented positions.
 - Dual mono mode for operating both channels with a single mono input.
 - Bridged mono mode for combining the power of both channels into a single higher powered channel.
 - Internally configurable for parallel mono mode, for single channel low impedance operation.
 - Internal jumpers to bypass Left and Right Level Controls.
 - Internal connection points for add-on accessories like the optional Balanced Transformer Kit.
 - Independent CH 1 and CH 2 speaker relays will instantaneously disconnect if fault conditions such as over temperature, short circuit or D.C. offset is detected.
 - Power Ready, Signal Present and Clip/Protect indicators
- CA-400 features:** 130W per channel into 8 ohms, 200W per channel into 4 ohms.
- CA-900 features:** 325W per channel into 8 ohms, 450W per channel into 4 ohms.

Stewart

Power Amplifiers

PA-1000
PA-1400
PA-1800

- 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-1000 or PA-1400's (4 PA-1800's) can be run on one standard 20 amp 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.

BSN

Performance Series Amplifiers

Performance Series 1 300 Watt Power Amplifier

- Measuring only 3.5 inches high and weighing 26 pounds, the Series 1 delivers more than 150 watts per channel.
- Its welded steel chassis is unbelievably strong while a custom heat sink extension provides exceptional thermal capacity.
- An internal fan provides quiet background noise levels for critical monitoring applications and when pushed hard the cooling system insures continuous cool operation even in the most demanding situations.
- Active balanced inputs with both XLR and 1/4" phone jacks.
- Supplied with quality 5-way binding posts for highly reliable speaker connection.
- Front panel handles are reversible for either rack mount installation or easy handling.
- LEDs are provided for signal presence and clip indication; the detented gain controls have large knobs for easy front panel adjustments.

Performance Series 2 600-Watt Power Amplifier

- Same as above except the Series 2 weighs 32 pounds and delivers more than 300 watts per channel.

Performance Series 4 1200-Watt Power Amplifier

- Same as above except the Series 4 weighs 53 pounds and delivers more than 600 watts per channel.
- Has a switch selectable clipping eliminator that prevents damage to the speakers.

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 +26 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.
- Switched rotary pots resist and other contaminants.



MS1402-VLZ 14 x 2 Compact Mic/Line Mixer

Mackie's fanatical engineers have done it again. Balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room feature. Nice long 60mm faders, six studio-quality mic preamps and extra ALT 3-4 stereo bus—in less than 1.3 square feet of space.

- Studio grade mic preamps (chs. 1-6) with high headroom, low noise and phantom power. Also incorporate low cut filters to cut mic handling thumps, pops and wind noise. Lets you safely use low shelving EQ on vocals.
- Trim controls (chs. 1-6) with ultra wide range (+10 to -40dB) handle everything from hot digital multitrack leads to whispering lead singers and older, low output keyboards.
- Pan control with constant loudness and high L/R attenuation so you can pan hard left or right without bleed-through.
- Two aux sends per channel with 15dB extra gain above Unity.



The new MS-1202, 1402 and 1604 all include VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for Mackie's acclaimed 8-Bus console series, VLZ effectively reduces thermal noise and minimizes crosstalk by raising current and decreasing resistance.

CR-1604 VLZ 16-Channel Mic-Line Mixer

The hands-down choice for major touring groups, studio session players, as well as broadcast and sound contracting. The new CR-1604 VLZ features everything you would expect from a larger console, and then some! 24 usable line inputs with special headroom/ultra-low noise Unityplus circuitry, seven AUX sends, 3-band EQ, constant power pan controls, 10-segment LED output metering and discrete front and 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 assigns to 1-2, 3-4 or main L-R.
- 3-band EQ with mid-frequency sweep and low cut switch.
- AFL/PFL solo and mute switches with overload and signal present indicators.
- Rear panel features include insert points and 1/4-inch XLR connectors on every channel, as well as RCA tape inputs/outputs.
- 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 onboard signal processing gear.
- Double reinforced grounding system eliminates any hum.
- World-class power supply provides higher voltage output for better headroom and higher S/N ratio.

PREMIUM QUALITY MIC PRE-AMPS

- The M-2600's mic pre-amps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel.
- Accepts balanced or unbalanced 1/4" inputs, and low-impedance XLR jacks. Better still, the TRIM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the -20 dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug in anything—keyboards, guitars, basses, active or passive microphones, samplers and more.

THE BEST AUX SECTION IN THE BUSINESS

Versatile AUX section has 8 sends total, 2 in stereo. Send signal in stereo or mono, pre- or post-fader. Available all at once. Return signal through any of 6 stereo paths.

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 busses, 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 lightly sprung, look 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. Control centers assure zero positions for EQ and PAN knobs. Smooth low throw 100mm faders glide nicely yet allow you to position them securely without fear of accidentally slipping to another position.



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 unmuter 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 TCC functions that are as easy to use as a CD player. It's also equipped with basic pro features such as ID effect 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-IDs according to the track number and index information of the CD-Q code. So even if there is a break in the middle of a song or there isn't a non-recorded section between two songs, you can locate to the S-ID location (eg. beginning of song) precisely.

D-10 Digital Master Recorder



- Switchable 44.1 and 48kHz sampling frequencies
- Analog interface includes switchable XLR-balanced (+4dB) and unbalanced RCA (-10dB) inputs and outputs
- Equipped with and XLR-balanced AES/EBU digital interface and optical (S/PDIF) input/output conforming to IEC consumer
- Built-in 8MB RAM (4 MB x 2) offers instant start as well as scrubbing at 1ms/second accuracy.
- Advance jog/shuttle for precision cueing and monitoring.
- Auto Cue provides automatic locating to the exact start of audio modulation during ID search and tape loading.
- Universal GPI input/output enables easy and fast assemble editing, based on A-time between a pair of D-10s.
- Switchable 2-position reference level: -12dB/20dB.
- Start and Skip IDs as well as up to 799 P-IDs 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 Pro R-time. Also provides PCM monitoring.
- Optional 8333 interface card adds timecode and RS-422 (X 2) functionality to the D-10.
- Reads an external timecode and records on the sub-code area.
- Reproduces and outputs the timecode from sub-code area.
- Switchable RS-422 and EBUS protocols. Using the EBUS, up to 16 D-10s can be daisy chained.

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EQUIPMENT 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 -60dB to +4dB.
- Analog line inputs & outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enable direct digital transfers.
- Uses next generation A/D & D/A converters for amazing quality.
- Supports 32/44.1/48kHz sample rates & S/MPEG-free recording.
- Included in its design is a MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- TRS jack & level control to monitor sound with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter & 1 battery.



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 connectors. 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 the optical cable & the coaxial cable. Also includes a wireless remote control.



TCD-D10 PRO II

Portable DAT Recorder

- Has balanced XLR input, switchable mic (-60dB) or line (+4dB) inputs. A 12-pin digital connector provides interfacing with AES/EBU digital signals of 32/44.1/48.0 kHz sampling rates.
- Comprehensive self-diagnostics function constantly monitors the rotation of the head drum, capstan and reels. The tape transport mode and load/unload time are continuously checked as well.
- Up to 99 start IDs can be recorded in the subcode area. When the record button is pressed, the start ID is recorded automatically for 9 seconds. During recording, it can also be added manually to any position of the tape. Search for start IDs is 100X normal speed.
- 20-segment digital peak level meters include overload indicators. Closely tracks input signal for accurate level indications.
- During playback, the date and time of recording is displayed.
- Has a record-level limiter with a fast attack time of 300ms. Mic attenuator prevents distortion by suppressing signal level 20 dB.
- Immediate playback is possible through a built-in speaker.
- Supplied wired remote controller also accepts a mic holder. Two mic stand screw adapters are also supplied.
- Supplied NP-22H rechargeable battery provides 1.5 hours of operation. Optional NPA-D10 battery adapter enables 1 hour on AA batt. Supplied ACP-88 AC adapter operates on 100-240V 50/60Hz.



PORTADAT

PDR1000/PDR1000TC

Professional Portable DAT Recorders



- Direct drive transport with 4 heads for confidence monitoring.
- Balanced XLR mic and line XLR mic and two RCA analog line outputs. Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU balanced XLR.
- Left/Right channel mic input attenuation selector (0dB/-30dB).
- 48V phantom power, built-in limiter & internal monitor speaker.
- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status, ID number, tape source status and machine status.
- Supplied Nickel Metal Hydride rechargeable battery powers the PDR1000 for two hours. The battery has no "memory effect" and is charged in two hours with the supplied AC Adapter/charger.

PDR1000TC Additional Features:
In addition to all the features of the PDR1000 recorder, the PDR1000TC is equipped to record, generate and reference to time code in all existing international standards.
• All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
• External synchronization to video, field sync and word sync.

Roland



DM-800

Digital Audio Workstation

The DM-800 is 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 will make your work simpler, faster, more productive and more profitable. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing, to 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.

POWERFUL EDITING

- Time compression, pitch compression
- Completely non-destructive cutting, erasing, copying
- Very fast looping for music or scrub editing
- Scrub preview and preview to, from and thru
- Six levels of waveform zoom
- Optional RS-422 interface (D10-8000) for 9-pin control from video editor

FLEXIBLE I/O STRUCTURE

- Full digital patch bay
- Stereo AUX send bus
- Two stereo AUX returns
- Direct channel outputs
- Digital stereo input and two digital stereo outputs
- Four balanced analog inputs with gain controls and four balanced analog outputs with option for 4 more

FULL AUTOMATION

- Dynamic and snapshot automation of level, pan, 2-band EQ, including frequency select, boost and cut
- Microscope editing of automation data
- Phase level editing of level, crossfade and fade in/out

TRIGGER FEATURES:

- Trigger mode for any combination of 8 tracks for vocal fly ins or sound effects placements
- Advanced trigger mode for live operation with preset or dial up cue of phrases to be played one after another

MIDI FEATURES:

- MIDI machine control
- Internal tempo maps
- Accurate editing by bars and beats sub-beats
- 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.

ACCURATE SYNCHRONIZATION

- Frame accurate sync to any time code
- Locks to MTC
- Generates and reads all types of SMPTE, including 24, 25, 29.97 (Drop/non-drop) and 30 frames per second
- Incoming SMPTE reshaped to output jack

RECORDING OPTIONS

- Records to standard SCSI hard drives
- Up to 24 hours recording time possible
- Uses Magneto Optical or Syquest drives for fast project changeovers
- Optional internal 2.5" Drives for portable operation

PROJECT CATALOGING

- Up to 150 projects on line at once
- Easy cataloging of sound effects and projects
- Easy transfer of sounds from one project to another
- File compatible with DM-80

HIGH QUALITY SOUND

- Sampling rates of 48/44.1/32 kHz
- 18-Bit A/D and D/A with 128 and 8 times oversampling
- 24-bit internal processing

VIDEO OUT

- Composite, S-video, digital RGB output
- All track overview with infinite level of project zoom
- Views of phase and waveform editing
- Very accurate level mMeters
- Track status and time location

ALESIS adat xt

8-Track Digital Audio Recorder

An incredibly affordable tool, the new 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 onboard digital editing and flexible autolock.



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 20-bit, 8x oversampling performance for a flatter frequency spectrum, improved phase response and much less low-amplitude distortion.
- Frequency response is 20 Hz to 20kHz ± 0.5 dB, S/N ratio is greater than 92dB, crosstalk between channels is better than -90dB @ 1kHz.

Flexible Inputs and Outputs:

- Servo-balanced 56-pin ELC connector operates at +4dB for interfacing with consoles with 4 dB balanced/unbalanced inputs/outputs. Also includes unbalanced -10dB inputs/outputs (phono connectors).
- Has an electronic patch bay built-in so it can be used with stereo and 4-bus consoles.
- Multiple Optical Digital I/O can carry up to eight tracks at once completely in the digital domain. 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. A new Track Copy feature allows you to make a digital clone of any track (or group of tracks) and copy it to any other track (or group) on the same recorder. This allows you to assemble composite tracks for digital editing.
- Use two or more ADAT-XTs and the Tape Offset feature lets you copy and paste not only from track to track, but from location to location. Tape Offset assembles the elements of a project with a minimum of repetitive over dubbing. It changes the relative tape position of a slave XT to its master, so you can "fly" audio to different locations on each tape.
- Track Delay feature allows you to delay the time reference of a track by up to 170ms. With Track Delay, you can easily change the groove of a tune. Track Delay is individually adjustable on each channel and is excellent for fixing slight timing errors in recorded tracks (player lags behind or rushes the beat). In recordings with multiple microphones, you can time-align each track, precisely compensating for the spacing between mics with accuracy to 0.0001 seconds.

Intelligent Transport:

- Rewinds and fast-forwards up to 4X faster than the original ADAT.
- Advanced transport software continuously monitors autolock performance and the head constantly reads ADAT's built-in sample-accurate time code—even in fast wind modes.
- Newly developed Dynamic Braking software allows the transport to quickly wind to locate points while taking every precaution to treat the tape gently.

Onboard Autolocator with Auto Record:

- Onboard 10-point autolocate system provides quick access to multiple tape locations. Four specialized locate points make your recording sessions quicker and easier.
- Auto Play automatically enters Play the moment any autolocate point is reached, Auto Return automatically rewinds at the end of a loop.
- Auto Record function lets you automate punch-in/punch-out times that are accurate to 1/1000th of a second.
- Rehearse Mode allows you to enter or exit record modes without actually laying tracks to tape.
- To record on the fly, you can even use the individual Record Enable buttons to punch in and out of tracks.
- Includes remote control with transport and locate functions, offers a footswitch jack for hands-free punch-in.

Optional Accessories:

- BRC Master Remote Control lets you command up to 128 tracks from a single location, with 460 nameable locate points, SMPTE & MIDI synchronization & extensive digital editing power.
- AI-1 Digital Interface offers sample rate and digital format conversion between the ADAT-XT's Optical Digital Interface and AES/EBU and S/PDIF formats.
- AI-2 Synchronization Interface allows synchronization to video and film. The AI-2 offers compatibility with video recorders and editing systems (including TimeLine's Lynx-2 system) and can issue MIDI Time Code and translate MIDI Machine Control commands to the ADAT-XT.

Digital Multi-Track Recorders

TASCAM



The first thing you notice about the eight channel DA-88 is the size of the cassette - it's a small Hi-8mm video cassette. You'll also notice the recording time - up to 120 minutes. These are just 2 of the advantages of the DA-88's innovative use of 8mm technology.

- The ATF system ensures that there will be no tracking errors or loss of synchronization. The DA-88 doesn't even have (or need) a tracking adjustment. All eight tracks of audio are perfectly synchronized. What's more, this system guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks - whether you have one deck or sixteen (up to 128 tracks!).
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48kHz. The frequency response is flat from 20Hz to 20kHz while the dynamic range exceeds 92dB.
- Execute seamless Punch-ins and Punch-outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks, whether you want to generate special effects or compensate for poor timing.

Fostex RD-8



Based on the S-VHS format, the RD-8 is designed for the home project or professional recording studio. Features include up to 40 minutes of recording time on a single tape, noiseless punch-in/out, selectable sampling frequencies of 44.1 and 48kHz and pitch and track delay controls. Systems are expandable from 8 to 128 tracks and there are a wide variety of options available.

- Full transport control is available via the RS-422 port, providing full control right from your video bay. The RD-8 records at either 44.1 or 48kHz and will perform Pull-Up and Pull-Down functions for film/video transfers. The Track Slip feature helps maintain perfect sound-to-picture sync and the 8-Channel Optical Digital Interface keeps you in the digital domain.
- The S-VHS transport in the RD-8 was selected because of its proven reliability, rugged construction and superb tape handling capabilities. 8 tracks on S-VHS tape allow much wider track widths than is possible on other digital tape formats.
- With its LCD and 10-digit display panel, the RD-8 is remarkably easy to control. You can readily access 100 locate points, and cross-fade time is fully controllable in machine to machine editing. Table of Contents data can be recorded on tape.
- Since the RD-8 is fully ADAT compliant, your machine can play tapes made on other compatible machines, and can be controlled by other manufacturers ADAT controllers. Your tapes will also be playable on any other ADAT deck.

SONY

PCM-800

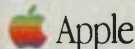


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- Also features a shuttle dial for precise tape control, variable speed playback of 6% in 0.1% increments and a flat frequency response from 20Hz to 20kHz.
- Up to 16 PCM-800's can be operated in perfect sync with optional RCC-S1 sync cables, providing up to 128 channels of digital audio recording and reproduction.
- Optional DABK-801 Sync Board provides SMPTE/EBU time code generation and chase synchronization. It can be locked to the incoming time code with subframe accurate offset, which is ideal for audio-follow-video applications.
- The DABK-801 also provides complete video synchronization to external video reference signal.
- Optional RM-D800 provides comprehensive remote control over all functions of the PCM-800. The RM-D800 can control up to six units for up to 48 channels of digital audio.

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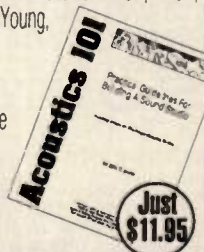
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Be sure to also take advantage of the inexpensive promotion and distribution opportunities available on the **World Wide Web**. You can set up your own Web "homepage," or you may want to consider joining the Oasis-sponsored **Musicians on the Internet** program, which promotes your CD online & distributes it via the CDnow! superstore.

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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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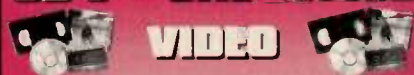
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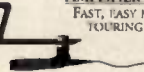
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ACROSS THE BOARD

continued from page 146

work accomplished usually have a very low number in that particular column.

There's a billboard near the Burbank airport that says "Safety Is No Accident." I think that a similar sign should be tacked up in every studio, saying "Preventative Maintenance Is No Problem."

FUN, FUN, FUN

If when you hear the name "409" you think of the all-purpose cleaner, then the rest of this column probably will be of no interest, but if the name "409" conjures up visions of '61 Chevys with 409-cubic-inch engines and the Beach Boys, then stick around.

Recently, I was lucky enough to get to work on the new Beach Boys (they are old enough now that I call them the Beach Guys) album that will be coming out this summer. The probably double album consists of remakes of all of the original Beach Boys songs, but with lead vocals performed by guest artists. Timothy B.

Schmit sang "Caroline, No" while Jimmy Web arranged and conducted the string session. The Beach Boys performed flawless harmonies that will snap you right back to the '60s. Junior Brown sang "409" and played the solo on his Dobro-guitar...what-ever-the-hell it is. Very cool. Sawyer Brown, Lorrie Morgan, and James House guested on a few of the tunes as well. Brian Wilson was there as well, and sang his butt off.

Whenever Joe Thomas, the producer, said, "OK, let's put some vocals on this track," it looked like a traffic jam on Malibu's Pacific Coast Highway as Brian, Al, Mike, Carl, Bruce, and Matt pushed their way down the hall and out to the microphones. The whole week that I got to work on the project was nothing but fun. Rick Fritz, Joe Thomas's engineer, let me drive for the week in the new Masterfonics Infrasonic Tracking Room in Nashville. The console was the new Solid State Logic SL 9000 J with full Ultimotion. The studio was big enough that I could set up for 30 strings, woodwinds, tympani, and percussion, and still cut basic tracks with drums, guitar, piano, bass, and vocal without having to move anything. Cool.

ENDING IT ALL

No, I am not going to shoot myself, I am just getting out of here until next month. Here's some closing thoughts to help tide you over:

- My Yamaha 02R is doing just fine, thank you.

- My Web site has been getting about 5000 hits per week and is starting to look pretty cool. There are some Beach Boy photos, as well as links to Steely Dan, Singing Mongooses, FBI, and Lawrence Livermore Laboratories. Check out the *EQ* magazine section. It has all of my columns since 1989 and some of my reviews as well. There will be more *EQ* stuff added, as well as other neat stuff like a copy of the U.S. law pertaining to contact with aliens (not the ones operating convenience stores).

- TTFN!

Speaking of Roger's World Wide Web page...you can find it at <http://www.digital-atomics.com>. Roger's e-mail is rnichols@digital-atomics.com. The time on Roger's atomic clock right now is 17:34:21.24356271835463278912 001 UTC in case you want to set your watch.

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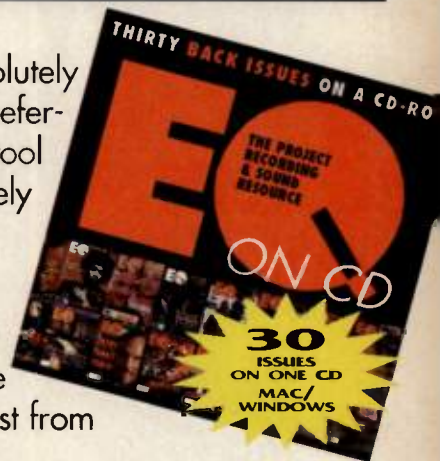
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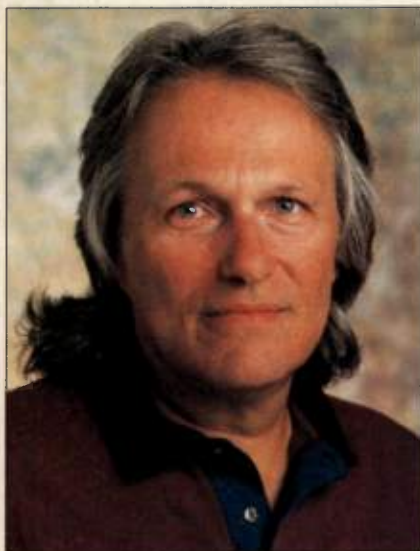
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Maintenance and Misery



Like love and marriage,
you just can't have one
without the other
(unfortunately)

BY ROGER NICHOLS

To me, maintenance is a subject that should be covered in school right along side of Reading, wRiting, and aRithmetic. Maintenance is a way of life for every living being. If you are a beaver, you have to maintain your whole dam house. If you are a studio owner, you have to maintain your whole damn studio, and, unlike the beaver, it feels like you are never going to get your head above water.

If you have ever spilled a Coke or coffee on a console, you know what

maintenance is. If you have ever busted a radiator hose on a deserted highway, you know what maintenance is. If you have ever been split up from your wife, you know what separate maintenance is.

The most important part of maintenance is preventative maintenance. Just like going in to the doctor for a flu shot before the season hits, you can prevent a lot of the problems that crop up in the studio by performing some day-to-day tasks that minimize the potential for session stopping catastrophes.

ROTARY CLUB WELL CARE

Although we take them for granted, DAT machines, TASCAM DA-88's, ADATs, Sony PCM-800's, and the Akai ADAM (don't forget the Sony PCM-F1) are a pretty sophisticated pieces of equipment. It takes a lot of precision to track those hair-thin tracks across a moving tape with heads rotating faster than the tires on a Subaru at 60 miles per hour. In this environment, "Cleanliness is Next to Godliness, I mean High Fidelity." (I must admit that I borrowed that saying from Stan Freeberg's 1959 recording "A Child's Garden of Freeberg." Steve St. Croix must have an original copy.)

Regular cleaning of your DAT (or other helical scan) machine is a must. If you wait until the "CLEAN" warning comes on or the error LED to start flashing, then it is probably too late. The heads will have become so clogged with oxide that no amount of cleaning will repair them, and you will have to spend \$200 to \$700 to replace the head drum. A once-a-week bout with the cleaning DAT (or 8mm or VHS) tape will save you a lot of misery in the end. Please remember that the cleaning tape should only be used for about 15 seconds, and should not be rewound. By not rewinding the cleaning tape, you ensure that a new fresh section of cleaning tape contacts the heads during the cleaning cycle. The TASCAM and Sony machines know when you have inserted a cleaning tape and go through the process automatically.

If you are a *very* experienced maintenance type person, or you have a friend with a video repair shop, you can clean the heads on a rotary head machine by removing the case and using a Chemtronics chamois tip cleaning stick to clean the heads with denatured alcohol or video head cleaner. Do not use rubbing alcohol because it contains traces of oil and will leave a coating behind that will attract more debris than you removed in the cleaning process. In some states, you can buy 180-proof alcohol like Everclear at the liquor store. I have been to more than a few studios that use Everclear to clean their tape machines, and if things aren't going well, they can drink a little of it to make them feel better. Back to the subject here, have someone physically teach you how to clean the rotary heads. One wrong move and you will be replacing the head drum.

THE "DUH" FACTOR

Maintenance and creativity take opposite sides of the brain. When you are in a studio-for-hire and something breaks, it completely ruins the creative flow process. When a producer is looking to book a studio for his next project, the quality of maintenance is way up near the top of the list. I have personally stayed away from otherwise great studios because the facility was ill maintained. The worst possible scenario is when you are trying to perform a task in the control room and you discover some small but annoying problem. When you call the maintenance staff in to take a look, they say, "Well, that's what you get for trying to do it that way." My next session will be at another studio.

I rate studios on a little sheet I keep in my Day Timer. One of the columns is labeled "Duh." If the tech comes into the control room after being rudely awakened and answers my question with "Duh, I dunno," then that studio gets a very high rating for "Duh" factor. The facilities where I can get the most amount of

continued on page 144

Perfection

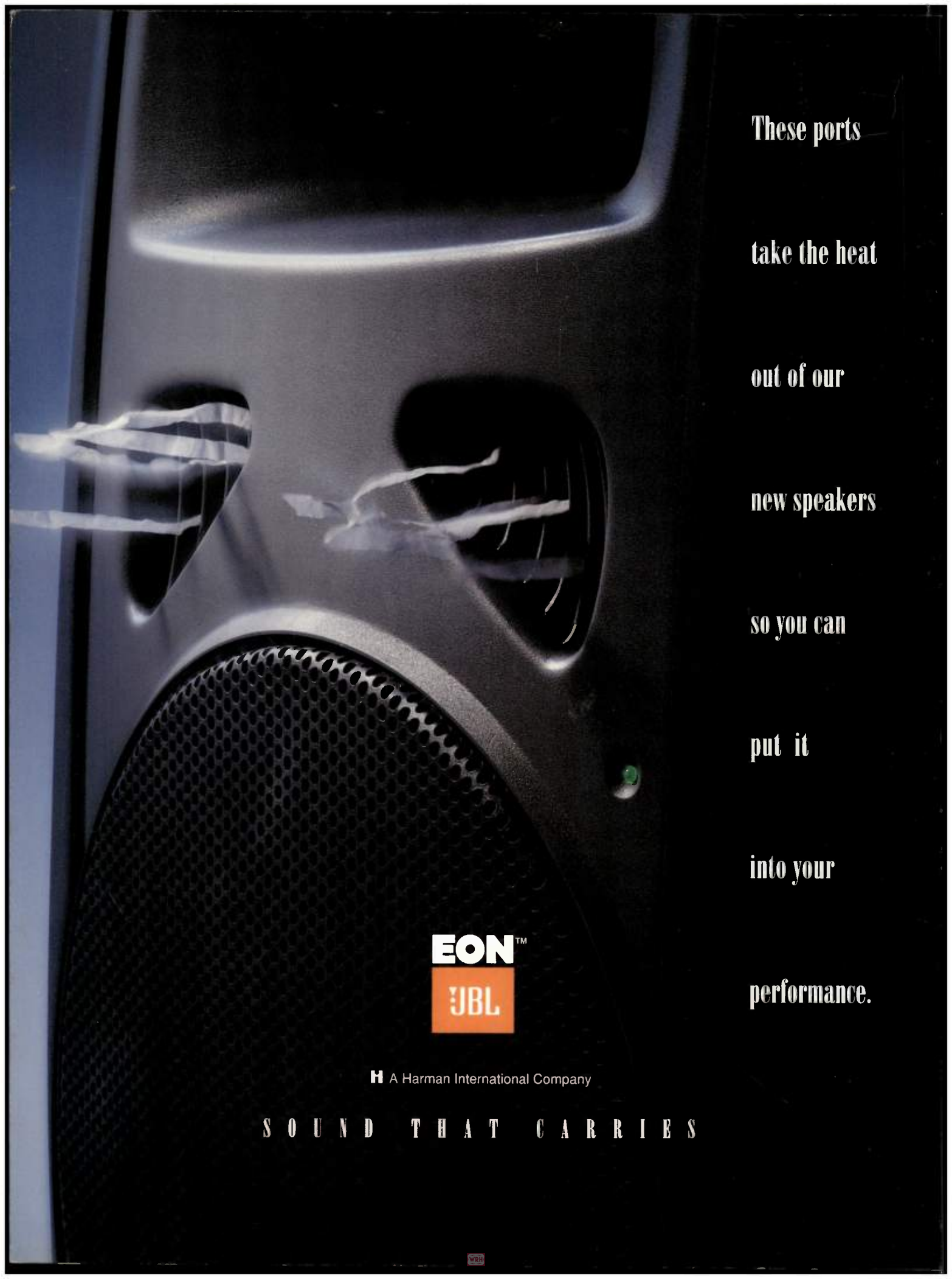


Every element of your performance is in place.
This is the take that goes for the platinum.
When there is no room for compromise, you choose
Neumann microphones. (Look-alikes just can't cut it.)
Only Neumann's unique combination of classic
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CIRCLE 70 ON FREE INFO CARD

A close-up, black and white photograph of a car's interior. The focus is on a speaker and two air vents. Wisps of smoke or steam are emerging from the air vents, suggesting heat. The speaker has a mesh grille. The overall tone is dramatic and emphasizes the 'heat' mentioned in the text.

These ports
take the heat
out of our
new speakers
so you can
put it
into your
performance.



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