

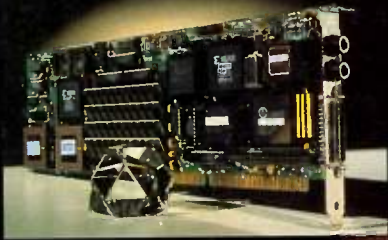
**TOTALLY TUBULAR REVIEWS: ROLLS • RSP TECHNOLOGIES • PEAVEY  
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**EQ**

**THE PROJECT  
RECORDING  
& SOUND  
MAGAZINE**

**1995 • ISSUE SIX**

**IN REVIEW:**



**SPECTRAL  
PRISMA MUSIC**

**DIGITAL TAPE  
DILEMMAS**

**ANALOG**

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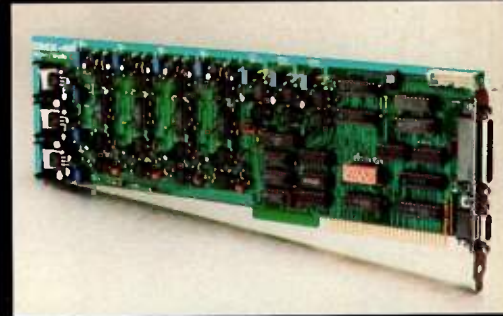
World Radio History



# EQ



PROJECT RECORDING  
& SOUND TECHNIQUES  
VOLUME 6, ISSUE 6  
JUNE 1995



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She's been "Around the World," but now singer Lisa Stansfield is back in her home town of West Lancashire and is putting the finishing touches on the upgrade of her project studio — which has grown tremendously with the addition the world's first Amek 9098 console.
- GLEAMING THE TUBE** *By Eddie Ciletti and Craig Anderton* .....66  
Even digital purists can't deny the magic of the vacuum tube. Revered for its warmth, the tube has crept back into the product lines of many manufacturers. In this special section, *EQ* takes a look at seven of these next-generation tube devices — the Rolls RP-220 mic preamp, the RSP Technologies Saturator, the Aphex Model 107 mic preamp, the Giltronics 356AT mic preamp, the Peavey VMP 2 mic preamp, the Grooves Tubes MP1 mic preamp, and the D.W. Fearn VT-1 mic preamp. This section also includes tips and techniques on using tubes.
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A 32\*8 & 24\*8 were used to track - and partially mix - Promised Land.  
A second 24\*4 was used during playback.



Mackoids meet Queensrÿche at their island cabin retreat.

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CIRCLE 44 ON FREE INFO CARD

World Radio History





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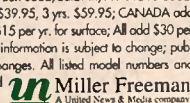
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**LETTERS TO EQ**

**AGE OLD WISDOM**

It has come to my attention that Roger Nichols made a reference to my age in his column [March '95]. I feel that I should respond to this personal assault by setting the record straight. Yes, it's true; I'm old. In fact, I'm so old that my first three gold albums were recorded on wire, as tape had not yet been invented. There, I feel better now with that out in the open. They say that to reveal the truth is to disarm your enemies. Oh, yes, I might as well take this opportunity to *thank* Mr. Nichols, for when I was a mere child struggling to master the complexities of producing and engineering, I knew that whenever I felt stuck, I could go to the store and buy any of a number of Roger's hit albums to see how they used to do it. In fact, I highly recommend listening to Roger's early work to any aspiring producer or engineer who can get his hands on an Edison wax-cylinder player.

*Stephen St. Croix  
via America Online*

**CHANGE YOUR TONE**

Firstly, congratulations on a great magazine, with interesting well-written articles.

Secondly, I would like to elaborate point #2 under "Mastering Tips to Remember," in the article "Mastering in the Project Studio" [April '95]. The author makes a very specific point on the necessity to print accurate and complete tones for analog. This is great and deserves applause. For digital formats, however, I beg to differ. It is absolutely necessary to print tones (a full set) as well as pink noise on any digital format. While digital 0 (full scale) is an absolute in theory, in practice, various manufacturers are not always accurate. When transferred digitally, a recorded program with no "overs" on one machine can cause "overs" in another machine. Also, if you arrive at the "mastering facility" with no tones, there can be problems with phase at the high frequencies that you will never know about without tones. This can be corrected — if you have tones — by adjusting the time base corrector on the 1630. Any major problem that causes long drop outs (other than defective tape) can usually be corrected by a technician if he or she has pink noise to recalibrate the machine with.

Thirdly, the 0-VU reference level of a DAT machine is a function of the calibration of the A/D-D/A converters and can vary (depending on the manufacturer) from -8 to -20 (a SMPTE-proposed operating level?). With the experience that I have had with digital and the various formats, I believe in and advocate the printing of tones and pink noise on any DAT or other digital format that has valuable recorded information on it.

Please keep up the good work.

*Ian Terry  
CEO Asian Operations,  
MUSITECHNIC  
Chief Engineer, Studio Tempo  
President, SPARS-Quebec  
Director, SPARS-USA*

**D8 IN COURT**

Congratulations on your contest to rename the DTRS format. Get me the addresses and I'll be happy to send a free case of the DARS Series audio tape, our new 8mm tape (for the Sony PCM-800 and TASCAM DA-88) to both of the winners. D8 is truly a great name, which is why Sony trademarked that name a few years ago for its 8mm Digital Data Cartridge products. Sorry. Sometimes you just can't win.

*Tom Evans  
Marketing Manager  
Professional Media  
Sony Electronics Recording Media and  
Energy Products Group*

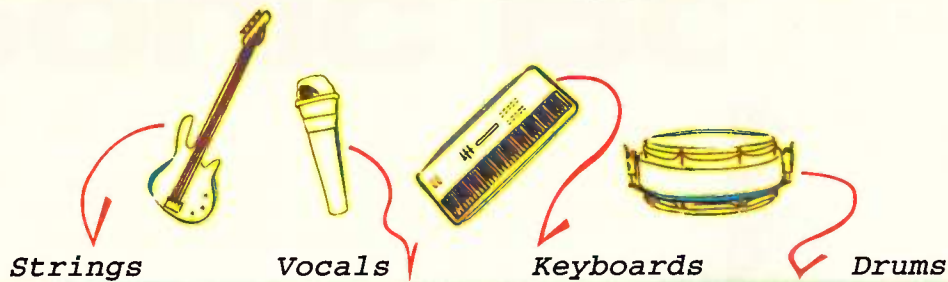
**MOD SQUAD**

I read Eddie Ciletti's article in the April '95 edition of EQ magazine with some interest, but also a considerable degree of concern at his suggestion that the modifications [for the Soundcraft 200 Series] might be applied to other mixers.

Mr. Ciletti is correct to stress the importance of careful grounding, and the "star grounding" scheme he describes is a good one to adopt in any audio installation. The concepts involved are also applicable within audio consoles, but there are important matters that Mr. Ciletti has ignored. The grounding scheme within consoles, particularly automated ones, is a complex issue involving considerations of the earth paths for digital as well as analog signals.

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**Steve Oppenheimer**  
*Electronic Musician* Editors' Choice (Equalizer/Filter)

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**Greg Rule**  
*Keyboard magazine*

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## LETTERS TO EQ

ment is something over which we at Amek take considerable care. Any changes to this arrangement are likely to introduce digital noise and may affect stability margins and RF rejection. They might even cause contraction of statutory limits of electromagnetic radiation levels.

It should hardly need stating that grounding modifications of the type proposed by Mr. Ciletti are likely to invalidate any warranty on the console. I would therefore advise readers against any attempts to "enhance" their consoles along the lines that Mr. Ciletti is suggesting. The results are likely to be at best disappointing and possibly even catastrophic!

A modern audio mixer from any reputable manufacturer should not exhibit an audible level of hum. Any hum that is present should be well below the general noise floor (hiss). If there is a significant hum level, questions need to be asked about the earthing system used in the installation.

If a console output appears to contain hum, the cause can more often be found in the grounding scheme of the installation. A good system will provide only one path from any given point to ground. Breaking this one path *with the mains isolated* should allow a resistance of several hundred ohms to be measured between the equipment and ground. Anything less than this indicates a second earth path that should be identified and removed. Earth paths through cable screens that link items of earthed equipment are a common cause.

Peter M. Harrison  
Director of Engineering  
Amek Systems & Controls Ltd.

### BREAKING WINDOWS

As a long-time appreciator of Craig Anderton's work, I've been somewhat dismayed at his continuing blather about Windows '95. Is Craig now working for Microsloth or what? This vaporware was announced in 1993 fer cryin' out loud! Why is the press such a willing dupe of Gate's spurious approach to "marketing"?

I've been trying to formulate a message that wasn't overly pejorative about having to see those praise-laden headlines, both in *EQ* and in *Pro Sound News*, the difficulty hanging

with my extreme irritation with this nonsense.

Imagine my delight to get the following from a friend via e-mail:

Three women are sitting in a bar talking about their love lives. The first one says, "My husband is an architect. When we make love it has power, it has form, it has function. It's incredible!" The second one says, "My husband is an artist. When we make love it has passion, it has emotion, it has vision. It's wonderful!" The third woman sighs and sips her margarita, then says, "My husband works for Microsoft. When we make love, he just sits at the end of the bed and tells me how great it's going to be when it gets here."

Beyond that, all one needs to ask Craig is, "Gee whiz, bro, is it gonna be as groovy as Word 6 [for the Mac]?" (hahahahaha) Get back to the music, and the hardware and software that is actually out there for us to use and appreciate.

Hank Alrich  
Greenville, CA

### CORRECTION

In the Product Views section of our April issue we mistakenly listed the frequency response of the Giltronics Model 356 vacuum tube preamp as  $\pm 2$  dB from 18–20 kHz. It should have read  $\pm .2$  dB from 18–20 kHz. For more information about the Model 356, check out the review in our special tube section starting on page 66. **EQ**

## WE INTERRUPT THIS PAGE...

...To announce the birth of  
Merilee Rose Anderton to our  
Technology Editor Craig Anderton.  
Send any congratulatory notes  
and cute little baby things to:

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# Sonic Boom



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*- Jim Aikin, Keyboard, May 1995*

*"Sound Forge succeeds in making itself the first truly complete professional sound editing system for Windows."*

*- Macromedia User Journal, March 1995*

*"This is what great software is all about."*

*- Electronic Musician, May 1995*

*"Sound Forge is a cool and full-featured program that's definitely a useful addition to any digi-head's toolbox"*

*- EQ, April 1995*

*"Sound Forge is so well written, so well documented, so powerful...it nearly brought tears to my eyes!"*

*- Seth Ritter, The Computer Program*

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**CIRCLE 72 ON FREE INFO CARD**  
World Radio History





## SKIP IT

**Q** In the March 1995 EQ Roger Nichols wrote about Ardent Recording Studios and how they are getting data onto a music CD without having to skip track 1. I have a jazz/reggae album ready to press, and I want to get a four-minute video on the CD that can be accessed by people with a multimedia PC. However, it also has to be transparent to the "straight" audio CD consumer, i.e., no "Skip track 1" message.

I have a quad-speed Yamaha recorder with CD Creator and SimpliCD. I understand about MPEG issues. Please, who can I talk in order to get more information and get my job done? Which replicator can handle the pressings?

Gus DeVille  
Palo Alto, CA

**A** It seems that Ardent Recording Studios does indeed have a solid amount of knowledge and expertise in this area. They are, in fact, at present patenting techniques for combining music and data on a CD (track 1), and are working on proprietary procedures in this field. Because you have already done your homework and are set to move ahead with your project, I would advise contacting Ardent directly. They would, perhaps, also be able to provide you with names of possible replicators. Contact Ardent Recording Studios at 2000 Madison Avenue, Memphis, TN 38104; Tel: 901-725-0855; Fax: 901-725-7011; E-mail: ArdentS@aol.com. Good luck and much success with your project.

Hector G. La Torre  
Executive Director

## TAPE FEAR

**Q** I just finished reading your article on DAT recorders [May '95], and as an owner of four machines (the latest being a TASCAM DA-30 mkII), I found it very informative. I have some DAT tape questions.

1) Is it true all DAT tape is really made by three or so media manufacturers?

2) Although many deck manufacturers claim three-hour DAT tapes are

too thin and may jam inside the machine, many people use them with no problems. (Some decks need to be modified to accept three-hour tapes. TASCAM, for example, has a pin sensor that can be disabled by a service technician to prevent three-hour tapes from being used.) Do the three-hour tapes create tape tension problems? If so, does that in turn affect the alignment and speed of the tape?

3) DAT vs. DDS: Many people are now using Computer Data Cartridges. The belief is that they meet a higher (ANSI) standard and are also constructed better to handle the constant FF and REW that a computer backup drive forces upon it. Should they be used to handle audio?

Mike Green  
via America Online

**A** Bruce Jackson, the head of Apogee Electronics, and I hope these answers will help you:

1) No, not all DAT tape is made by three media manufacturers. However, almost all is made in Japan, and, interestingly, the dozen or so DAT tape manufacturers do all use metal particles from only three suppliers. Apogee DAT, for example, takes what it feels is the best quality particles and outs them through a proprietary process that encases the metal particles and stops corrosion, which is the main cause of limited archive life.

2) Three-hour DATs are somewhat like the old 120-minute analog cassettes — to fit the extra tape into the same case requires thinner tape. Apogee doesn't offer this tape because [it feels] it is very difficult to produce a product with the ultra-low error rates and consistency of the standard base. Also, the tape is more fragile from a machine handling point of view.

3) DDS tapes are often the same tape with a different leader and are tested to meet the higher DDS standards. Apogee [as may other manufacturers] 100-percent tests its digital audio tape to performance levels several times beyond the DDS standard. DDS and Audio DAT Construction are essentially the same, with the audio product benefiting from the drive for better performance in the computer world (rather than the reverse). The long data cartridge use the thinner

tape and are designed to be used in the computer "DAT" drives, which are very different from audio DAT drives. We do not recommend using them in the "less gentle" audio drives.

Carol Craft  
Digital Media Specialist  
Apogee Electronics

## SI DCC?

**Q** Radio Shack is selling its DCC with Philips's guts for \$299. Since I'm a ways off from being able to afford a DAT. Is there any reason why I shouldn't consider a DCC purchase, besides the fact that most duplicating companies don't work off this format? Also, is the data compression "coloration" referred to in Craig Anderton's response in EQ&A (page 10, May 95) much greater than with DAT? Finally, can you back up digital hard drives with a DCC or DAT just like a regular digital tape back-up?

Clay  
via America Online

**A** DCC is already an orphan format. A great deal on a DCC would be like getting a great deal on a Beta VCR. If you go for this unit, buy lots of DCC tapes because I think it will be very hard to find them in the future. I would also be concerned about getting repairs if something goes wrong, although Radio Shack is pretty good about that stuff. Regarding "coloration": Yes, but "much greater" is a relative term. Either one sounds better than a cassette! As to your last question: No, with some exceptions. Some IBM hard-disk recording software lets you back up any kind of digital data to DAT with digital I/O. Digidesign software can back up audio files to DAT that have digital I/O, but not other types of files.

Craig Anderton  
Technology Editor

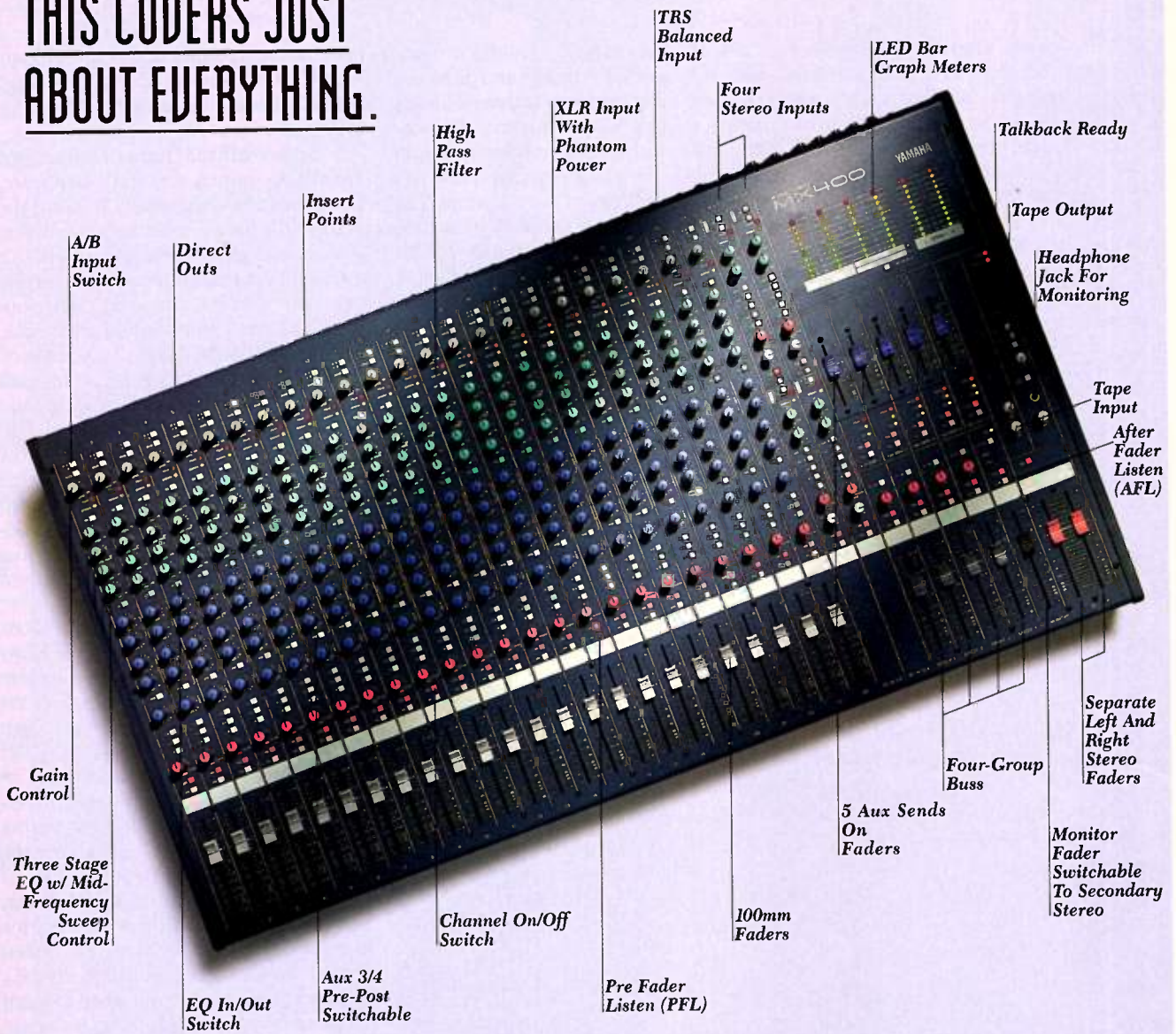
## TUBEY DOO

**Q** Would you please explain what "bias" and "tuning" mean with regard to vacuum tubes? Does your power amp or preamp start to sound different when tubes need to be tuned or biased? What is the procedure, and is it something that can be done by someone other than a technician?

Cory Rose  
Princeton, NJ



# THIS COVERS JUST ABOUT EVERYTHING.



## EVEN YOUR **ASS**.

There aren't many sure things in this business. Fortunately, the affordable mixer you see before you, the new Yamaha MX400, is a rock-solid exception to the rule. Available in 12, 16 and 24-channels and featuring a 4-group buss, the MX400 is one mixing decision that'll play well with everybody in your organization. And best of all, it comes with something you won't find on most other mixers. No regrets.

**YAMAHA**<sup>®</sup>



Call for more information.

© Yamaha Corporation of America, Pro Audio Products, P.O. Box 6600, Buena Park, CA 90622. (714) 522-9011. Yamaha Canada Music LTD, 135 Millner Avenue, Scarborough, Ontario M1S 3R1 (416) 298-1311.

CIRCLE 71 ON FREE INFO CARD

World Radio History





**A** Tube power amps definitely need to be correctly biased to perform and sound right. Biasing your amp should be done by an amp tech on his/her bench, and can range from about \$30 up to \$60 depending on the complexity of the amp. However, tube preamps are always used in Class A single-ended designs, which are self-biasing and require no adjustment.

The bias setting is much like the idle control on your car's engine. Basi-

cally, the bias supply provides a negative voltage that "tunes" and matches the tube's electron flow activity with the amp's design. So, just like an idle control on an engine, there is an optimum bias point for the particular tube you will be installing into your amp. The optimum bias point will vary from tube to tube, and, in most cases, it will be necessary to rebias your amp every time you change the tubes. Of course, you may get lucky and install new tubes that

have the exact same bias requirements as the set you are replacing. Described below are symptoms of an amp with under, over, and correct bias voltages:

**Under-Biased Amp:** Dangerous! Amp lacks punch and may also hum. The tubes run abnormally hot and the plates (the large, gray metal housing inside the glass) will glow red. An under-biased amp can be severely damaged and the tubes will wear out very fast. The engine is idling too fast.

**Over-Biased Amp:** Amp sounds dirty at all volume levels and loses gain and power. The tubes are running too cold but will last forever — if you can stand the tone. The engine is now idling too low.

**Correctly Biased Amp:** Amp sounds clean and tight at low and middle volume levels, and will distort musically (not harshly) when pushed to higher volume levels.

The only exception to an amp needing rebiasing every tube change is when you are retubing your amp with the same Groove Tube performance rating. [*In the interest of education, I'll excuse the slight and clever self-promotion here.*—HGL] Groove Tubes provide a wide range of closely matched high-quality sets of tubes. We've developed special quality testing procedures that match and grade our many types of power sets into a 1-to-10 performance scale that denotes the distortion characteristics of the tubes. So, for example, once your amp has been "tuned" for a set of Groove Tubes #5 6L6C, replacing them down the line *does not* require a rebias visit to the shop if you use the same tube type and rating number. More importantly, your amp retains the same tone and response you've selected.

For further info about tubes, including the various performance differences and specific biasing techniques, try reading our 850-page *Tube Amp Book*, 4.1th Edition, available at most music stores and through print distributors retailing for \$29.95.

Aspen Pittman  
President  
Groove Tubes

## Run Silent, Run Deep

ASHLY was the first to release a series of professional, fan-cooled amplifiers featuring power MOS-FET technology. The new CFT-1800 now offers the superior fidelity and rugged reliability of MOS-FET output devices in a quieter, convection cooled package. Designed primarily for use in recording studios, post-production facilities, or broadcast control rooms, the CFT-1800 will also satisfy even the most demanding audiophile enthusiast. In stereo operation, the powerful CFT-1800 delivers more than 300 watts per channel. Mono-bridged, the amplifier will put out a thundering 600 watts RMS for those room shaking subwoofer applications.

The user can also select various ASHLY Power-Card input options, such as a variable electronic crossover, an adjustable compressor-limiter, or even a very unique module for small mic-line mixing needs. The CFT-1800 is even covered under ASHLY's exclusive Five Year Worry-Free Warranty program. So, when the situation calls for running silent, while still running very, very deep, the CFT-1800 is the logical choice for the discriminating professional.



**ASHLY**

Ashly Audio Inc., 100 Fernwood Avenue Rochester, NY 14621 • Toll Free: 800-828-6308 • 716-644-5191 • FAX: 716-266-4589  
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CIRCLE 08 ON FREE INFO CARD

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Port Washington, NY 11050  
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# Who else provides so much ? For so little ?

## AMEK AUDIO

BIG provides the audio quality and standards which made AMEK world famous. Superb equalization, dual path modules, multiple aux and output buses and stereo inputs with MS decoding provide an incredible combination of facilities.

The 28-input version provides 56 mono and 4 stereo inputs with 4 stereo FX returns; the 44-input version provides 88 mono inputs and 4 stereo inputs with 4 stereo FX returns.

## AMEK SUPERTRUE

The world standard in console automation. Running on a 486-based PC, SUPERTRUE captures and replays faders, mutes, solos and automated switches to 1/4-frame accuracy - ideal for music recording, video and audio post and broadcast production.

Superb timecode-based off-line editing facilities include the Cue List, which can trigger both console and external MIDI Events, and the Mix Processor, which includes Repeat, Merge, Shift, Erase, Trim, Swap and Copy operations on mix data.

## AMEK RECALL

Stores the positions of non-automated knobs and switches - up to 10 console surfaces can be stored in each Title. Selective recall and auto-scan provide rapid identification of only those controls you wish to reset. Graphic displays and AMEK's unique talking Voice Prompt guide you rapidly through the Recall operation.

## AMEK VIRTUAL DYNAMICS

VIRTUAL DYNAMICS provides powerful and extremely flexible gain control on each channel. One from a choice of nine devices can be selected - 3 compressors, including a dual-slope compressor with expander; 3 gates, including the Supergate with hysteresis and peak hold functions; Limiter, Expander and Autopanner. Screen graphics present each virtual device as a familiar piece of rack-mount hardware, but the controls are operated with the trackball and settings are saved - and automatically reloaded - with the mix.

## AMEK VFX (Visual Effects)

This incredible new programme will be released in SUPERTRUE during 1995. Outboard effects devices by many of the most famous manufacturers - such as Eventide, Lexicon, Roland and TC - can be controlled directly from the console via MIDI. AMEK's graphics templates simplify operation by presenting multi-level menus in the form of knobs and switches, allowing instant access to all programmable parameters.

## AMEK MMC

MIDI Machine Control is now implemented within SUPERTRUE and allows operation of popular recorders such as ALESIS A-DAT and TASCAM DA-88 with many sophisticated locator facilities such as auto drop-in/out, pre- and post-roll and multiple locate points.

**big**  
by Langley



# AMEK

Head Office, Factory & Sales:  
AMEK Systems & Controls Ltd, Console City,  
Oldfield Road, Salford, M5 4SX, U.K.  
Telephone: 0161 834 6747  
Fax: 0161 834 0593

In the U.S.A.:  
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# THE NEW TSR-24S LETS YOU CREATE YOUR OWN SOUNDS IN TWO STEPS. 1-DREAM THEM UP. 2-LAY THEM DOWN.

With the TSR-24S, frustrating menus and time-consuming steps don't control your programming. You do. Choose the effects you want, in the order you



want, then program and listen to them instantly. No catches. Naturally, the TSR-24S has plenty of raw material, with an arsenal of more than 75 effects. Plus, multiple modulation effects

## 94 DB S / N RATIO

When it comes to sound, not even compact discs are as clean as the TSR-24S. Our Silencer™ digital noise gate wipes out noise by writing digital zeros when there's no signal present.

**94** dB

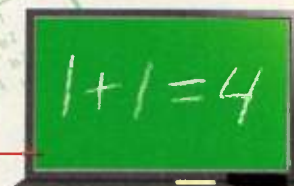
## SPECIAL EFFECTS

## OVER 75 EFFECTS

Gigaverb (the world's most flexible reverb), crystal clear sampling, multitap and modulated delays, multi-phase choruses and flangers, duckers, auto panners, 4-voice phasers, 10 separate EQs, 4 octaves of multi-voiced pitch shifting, arpeggiators, and more.

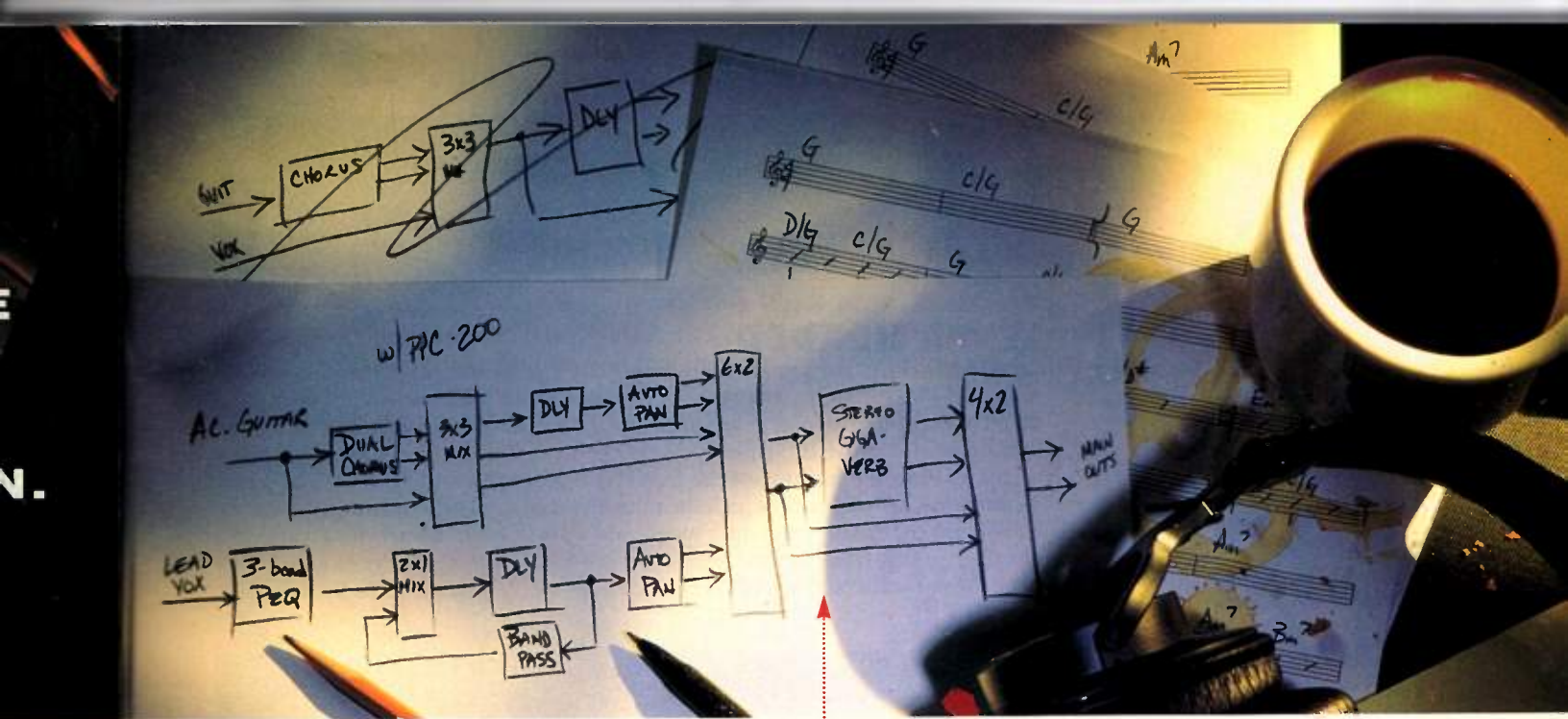
## DUAL DISCRETE STEREO

Take true stereo inputs, add four assignable outputs, and you get a lot of routing configurations. Let's see, there's stereo in, quad out; mono in, quad out; dual mono in, dual stereo out...well, you count 'em.



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capability and instant module/parameter access mean your great ideas become great music in a matter of seconds. No other machine at any price can match its flexibility. But even before you start dreaming up new sounds, you'll have to take the real first step. Drop by your nearest Digitech dealer today.



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**EXPANDABLE**

Add the available PPC 200 card, and you'll have the power of two TSR-24S processors. Parallel processing means seamless effect changes and more.

**S-DISC™**

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**ALGORITHMS**

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Press a couple of buttons.  
Reverb, chorus and reverb again?  
Redundant effects are not a problem. Link effects in any order to create algorithms, then program them in nearly limitless combinations.



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# EQ PRODUCT VIEWS

## MMMMM GOOD

**T**he Phonic M-Series 4-bus mixing consoles come available in 16- or 24-channel configurations. Stereo bus inputs and group bus inputs/outputs allow master and slave relationships between multiple M-Series mixers. Each channel provides XLR jacks and phantom power (switchable glob-



ally), and accepts 1/4-inch phone inputs. There are six auxiliary sends per channel, with one that has pre/postfader operation. Auxs two through six are set for postfader operation, but by utilizing internal jumpers, the auxs can be used for prefader operation. Each channel also has a 20-dB pad (switchable attenuator), individual gain control, and a 3-band EQ. For more information, contact Phonic, Corp., 1632 McGaw Ave., Irvine, CA 92714. Tel: 714-253-4000. Circle EQ free lit. #102.

## STUDIOUS STUDER

**S**tuder's D19 MicAD is a multichannel digital mic preamp designed to complement digital multitracks, digital audio workstations, multichannel digital recorders, and digital mixing and distribution systems. The MicAD features 20-bit digital output, and is a stand-alone, 2U-high 19-inch rack-mount unit. There are eight independent audio channels with separate XLR inputs for mic and line connections. Digital outputs feature four AES/EBU connectors in addition to a multichannel output in ADAT optical. S/PDIF or TDIF is available as an option. For more information, contact Studer, 1865 Air Lane Drive, Suite 12, Nashville, TN 37210. Tel: 615-391-3399. Circle EQ free lit. #105.



## LEVEL HEADED

**S**ymetrix has got something to keep your line level audio on its best behavior. The 422 stereo AGC/leveler is an automatic gain controller designed to boost stereo signals that fall below the target output level and pull back levels that rise above it. Symetrix's latest effort features a parallel input/output meter to allow the user to see the input level and adjust it to the desired target output level. Other features include a threshold control for adjusting sensitivity, a response control for regulating speed, and a peak limiter control for creating an absolute ceiling level. For more information, contact Symetrix, Inc., 14926 35th Ave., West, Lynnwood, WA 98037. Tel: 206-787-3222. Circle EQ free lit. #101.



## PAY LESS TO COMPRESS

**I**f money is a concern to you, then Furman's latest effort should put a smile on your face. The C-128 single-channel compressor/limiter is an economical unit that can be used in the studio as well as on the road. The action of the C-128 can be varied from a compression ratio of 2:1 (gentle compression) to 50:1 (hard limiting). Attack time is adjustable from .05 to 50 milliseconds, while release time may be varied from 50 milliseconds to 1.1 seconds. A ten-segment LED meter indicates the amount of gain reduction. The C-128 features three function push buttons: Compress, De-Ess, and Side Chain. Compress is used for normal compression or limiting. When De-Ess is selected, sibilant high frequencies above 4 kHz will trigger gain reduction. Side Chain activates the rear panel's sidechain jacks, which are used for direct access to the C-128's detector circuit. This permits patching in an equalizer to provide frequency-selective compression. Two C-128's may be linked together as a stereo pair via a standard patch cord with two 1/4-inch plugs. Retail price is \$269. For more information, contact Furman Sound, Inc., 30 Rich Street, Greenbrae, CA 94904. Tel: 415-927-1225. Circle EQ free lit. #103.

## GET CONVERTED

**O**tari has released the new UFC-24 universal digital audio format converter. The UFC-24 can convert up to 24 channels of audio at one time and simultaneously output up to five different formats. The UFC-24 comes standard with the capability to convert 24 channels of ADAT, TDIF-I, PD, or SDIF-II, with AES/EBU as an option. When used by itself, the UFC-24 with the AES option can output 120 channels of digital audio across five different formats at one time. Retail price is \$1995. For details, contact Otari Sales and Marketing, 378 Vintage Park Drive, Foster City, CA 94404. Tel: 415-341-5900. Circle EQ free lit. #104.





## BUGGING OUT

**S**haped like an insect, the MIDI Bug from Ensoniq indicates when there is reception of MIDI data occurring. The MIDI Bug is made of durable plastic and comes equipped with a MIDI In jack that can be connected to the MIDI Thru or Out of your favorite MIDI device. Any MIDI transmission received will trigger the Bug's eyes to glow. This insectoid is perfect for testing out your MIDI system or for adding an indicator light to gear that does not have one. It can be left connected to the MIDI Thru port to show the reception of MIDI data or connected to the MIDI Out of a device to determine if it is sending MIDI data. Retail price is \$12.95. For more details, contact Ensoniq, 155 Great Valley Parkway, Malvern, PA 19355. Tel: 800-553-5151. Circle EQ free lit. #106.



## SHIELDS UP

**K**RK Monitoring Systems now offers the option of video shielding on all of its nearfield monitors. Now tagged with the letter "S," the K•RoKS, 6000S, 7000BS, and 9000BS full-range monitors offer video shielding for placement close to video equipment. Drivers are shielded with a metal alloy "can" known as mu/metal, which isolates magnetic flux. For details, contact KRK Monitoring Systems, Inc., 16462 Gothard St., Unit D, Huntington Beach, CA 92647. Tel: 714-841-1600. Circle EQ free lit. #108.



## CATCH THIS 22

**d**B Technologies has released the AD122 22-bit stereo analog-to-digital converter. The AD122 converts analog signals to a 22-bit digital audio data stream. Twenty-two-bit operation resolves signals all the way down to -160 dB from full scale. Other features include -122 dB RMS noise floor, built-in Acoustic Bit Correction rebiting to 16- to 20-bit formats, and AES and word clock external sync. For details, contact Audio Intervisual Design, 1155 N. La Brea Ave., West Hollywood, CA 90038. Tel: 213-845-1155. Circle EQ free lit. #107.



## DECKED OUT

**D**enon's new pro cassette deck, the DN-790R, has three heads and Dolby S noise reduction that promotes wide dynamic range. The DN-790R has a dynamic range of 84 dB. The deck also includes Dolby B, C, and HX Pro. Additional features include a real-time tape counter, playback speed control, and an auto-tuning system that makes bias adjustments under computer control. The DN-790R comes with rack-mount brackets, while all inputs/out-

puts feature both balanced XLR and unbalanced phono-type connectors. The DN-790R retails at \$950. For details, contact Denon Electronics, 222 New Road, Parsippany, NJ 07054. Tel: 201-575-7810. Circle EQ free lit. #109.

## THREE-IN-ONE

**I**f you're in the market for some compression, de-essing, and spectral enhancement in a 1U rack-space device, check out dbx's 168A studio dynamics processor. Users can select either stereo or dual-mono mode. The compression section has been designed to protect digital recorders from overload without coloring the program material, as well as to allow live vocals to stand out without excessive loss of dynamic range. A "silence gate" gain hold prevents holes, pumping, breathing, and noise rush-up during pauses in the program material. The 168A features dual-independent de-essers to eliminate excessive sibilance on vocals. A continuously variable threshold over a 20-dB input range and special circuitry are the origins of the unit's de-essing functions. For more details, contact dbx Corp., 8760 S. Sandy Parkway, Sandy, UT 84070. Tel: 801-568-7660. Circle EQ free lit. #110.





# EQ PRODUCT VIEWS

## MIX ON A MACKIE

New from Mackie is the SR24•4 audio mixer. Mackie's latest mixing console can be used in the studio and on the road. The SR24•4 features the same high headroom and low noise performance found in the 8•Bus and Compact Mixer Series. Mackie's mixer also has sweepable mids, 6 aux sends (pre or post), aux send masters, talkback, mutes, PFL/AFL solo, and 20 mic preamps. Two-track returns and control room output are standard as well. For more information, contact Mackie, 16620 Wood-Red Road, Woodinville, WA 98072. Tel: 800-898-3211. Circle EQ free lit. #111.



## RACK 'N RAIL

The new MRK multibay electronic enclosure from Middle Atlantic Products is here for all of your racking purposes. It can be outfitted with fully perforated, vented, or Plexiglas front doors. The MRK model includes a removable top-mounted service plate and provisions for a 10-inch fan, built-in vertical cable raceways, a large cable entry at the bottom, threaded weld-nuts for optional leveling feet, and laser-cut internal braces made from 1/8-inch thick structural steel. Standard outside widths measure at 22-1/4 inches. The five MRK enclosures comprising the product line range in height from 70-3/4 inches to 83 inches, and incorporate up to 44 spaces. Outside depths range from 26 inches to 31 inches. The racks can be ganged together and anchored to the floor with all equipment installed. Retail prices begin at \$800. For details, contact Middle Atlantic Products, Inc., 8 North Corporate Drive, Riverdale, NJ 07457. Tel: 201-839-1011. Circle EQ free lit. #112.



## IT'S BETTER WITH BEYER

beyerdynamic's new MCE 83 studio microphone has been designed for studio applications such as instrument miking. It employs back electret technology and has a generous frequency response that is specially equalized for instrument miking. The MCE 83 has a cardioid polar pattern, a frequency response of 40-20,000 Hz, an SPL capability maximum of 138 dB, and an electret/condenser transducer. It has a voltage of 12-48 volts and is constructed of a brass case with a matte finish. Retail price is \$329. For more information, contact beyerdynamic, 56 Central Ave., Farmingdale, NY 11735. Tel: 516-293-3200. Circle EQ free lit. #113.



## FEELING GROOVY

It seems as if tubes are taking over and Groove Tubes (GT) is one of the companies heading the revolution — as is exemplified with its new vacuum tube condenser microphone, the MD3. The mic features GT's exclusive Sensitivity Control that allows the changing of the mic's sensitivity without affecting the tone quality. The MD3 features a large-diameter capsule that is home to a gold-sputtered Mylar diaphragm 3 microns thin. The acoustical port on the rear of the capsule will produce cardioid and omni polar patterns when fully closed or opened. Additionally, hypercardioid and supercardioid polar patterns are achieved in the positions between fully opened and closed. The MD3's condenser circuit employs a dual-stage tube preamp that uses a 12AT7 dual triode tube. Retail price is \$1840. For info, contact Groove Tubes, 12866 Foothill Blvd., Sylmar, CA 91342. Tel: 818-361-4500. Circle EQ free lit. #114.





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## Turn Iron Oxide Into Gold.

**Ampex 499. Unsurpassed dynamic range, lowest distortion.  
No wonder more artists go gold on Ampex than on all other tapes combined.**

Until you add the magic, tape is just iron and plastic. Make sure that magic comes across with Ampex 499 Grand Master® Gold tape. It delivers unsurpassed dynamic range and the lowest distortion of any analog mastering tape. Period.

In fact, every element of Ampex 499 Grand Master Gold is engineered to deliver the richest sound possible for audio, video and film.

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With Ampex you also get the largest distribution network in the business backed with customer service that has long been the industry standard.

Such attention to detail might seem a bit excessive, until you realize that more records go gold on Ampex tape than on all other tapes combined.

For more information, or the name of your nearest distributor, call **800 227-8443**. Ampex 499 Grand Master Gold. The gold standard.

# AMPEX

Ampex Recording Media Corporation, 401 Broadway, M.S. 22-02, Redwood City, California 94063

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# EQ PRODUCT VIEWS

## HAMMER AWAY

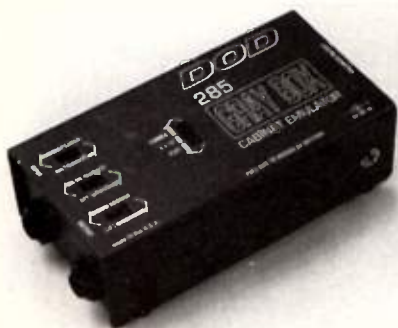
**S**uitable for all instruments, the TBR-3 Hammer 120 is part of Rivera's Rack Series of dual-channel amplifiers. The Rivera TBR-3 Hammer offers all-tube circuitry, and delivers 60 watts per channel and has an additional tube-gain stage giving players the ability to drive the power amp circuitry at full power directly from their instrument. A Hi/Lo power level switch as well as the ability to operate in triode or pentode mode allows a choice in output power from full to

25 percent while retaining the quality of the overdrive. For details, contact Rivera R&D Corp., 13310 Ralston Ave., Sylmar, CA 91342. Tel: 818-833-7066. Circle EQ free lit. #115.



## GRAY MATTER

**D**OD Electronics's 285 Gray Box provides cabinet emulation that allows guitar preamps and amplifiers to be connected to either a recording or PA console. The 285 can also function as a direct box for guitars and other electric instruments that need to be connected to mixing consoles. There are three speaker-setting options available with the Gray Box, and a flat frequency response setting is available for standard direct box use. When using the 285 with a guitar preamp or amp, the 4x12 cabinet emulator provides an enhanced low end while a Combo setting emulates a twin speaker, or open-backed cabinet. High-impedance unbalanced sources can be fed directly to a low-impedance input on the 285, while there is a ground-lift switch that minimizes hum and noise. For details, contact DOD, 8760 South Sandy Pkwy., Sandy, UT 84070. Tel: 801-566-8800. Circle EQ free lit. #116.

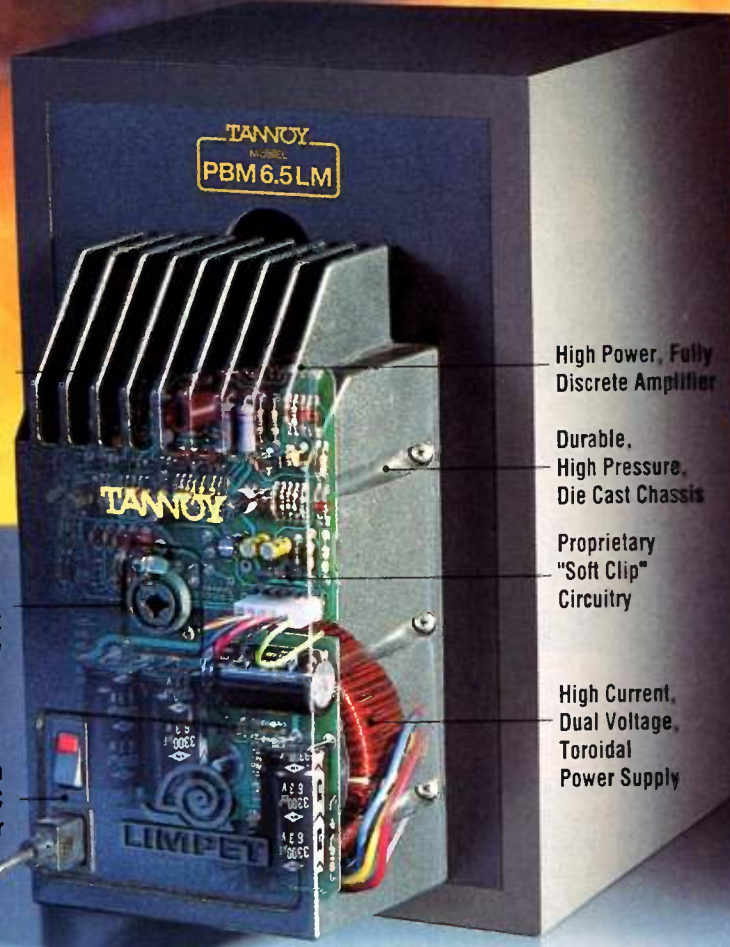


## HAVE YOU HEARD?

**Selenium's** new DH200HM compact 1-inch compression driver/biradial horn features a titanium diaphragm with kapton former, 100 watts RMS long term @ 2000 Hz, and a frequency response of 2000 Hz — 20,000 kHz. You even get a 2000 Hz high-pass filter. (Tel: 610-524-5530)...**Mosses & Mitchell**, the well-renowned English manufacturer of audio jacks, is taking its act to the states. Now audiophiles can reap the rewards from using Mosses & Mitchell's jacks by contacting its new U.S. distributor, **Marshall Electronics** (Tel: 310-390-6608)...**AKG** is making news with their new D230 microphone that has been specifically designed for use in demanding ENG (electronic news gathering) field applications. It's got an omnidirectional pattern, integrated windscreen, cast metal chassis, and an extended shaft for extended reach and better handling. (Tel: 818-895-3426)...The case is far from closed with the **Case Closed Company**, which manufactures custom-designed cases that store 8mm and DAT tapes in all kinds of configurations. The cases hold four 8mm tapes or three 8mm tapes and one DAT tape, or two 8mm tapes and two DAT tapes. It keeps the dust away and is really inexpensive — only \$5 bucks a case. (Tel: 810-264-7500)...**Rocktron** has been practicing voodoo lately with their VooDu combo rack. The heart of the rack is the VooDu valve preamp and the Velocity 120 amplifier. And the two units are housed in one carrying case so guitarists don't have to schlep around extra baggage. The preassembled rack combo comes with a 3-space bag, cables, and Rocktron rack plate...Politically correct **Technomad, Inc.** is just mad about the environment, and announced that it will use 100-percent recycled plastics in the manufacturing of its black polymer loudspeaker cabinets. Technomad also uses dyes free from heavy metals for coloring its cabinets, and all printing is done on unbleached recycled paper (Tel: 707-766-9548)...All systems are go with the System 19 from **Per Madsen Design**. It's the follow-up to the original RACKIT system of modular, stackable units that are used for storage for any kind of audio/video gear — pro or consumer. Component racks hold units up to 19 inches wide, and come in a variety of heights (Tel: 415-822-4883).



# They Call Him "Mr." Limpet®



Fully Integrated  
Heat Sink

XLR or 1/4" Combi  
Input With 3 Position  
Adjustable Input  
Sensitivity

Lighted AC Switch  
& Detachable IEC  
Connector

High Power, Fully  
Discrete Amplifier

Durable,  
High Pressure,  
Die Cast Chassis

Proprietary  
"Soft Clip"  
Circuitry

High Current,  
Dual Voltage,  
Toroidal  
Power Supply

■ Every once in a while a product comes along which not only meets the ever increasing demands of the market, but one whose smooth commercial styling, ergonomics, durability and outstanding performance demands respect. Introducing MR. LIMPET. ■ The LIMPET is a unique, compact design that combines a very high current toroidal power supply, fully discrete amplification stages, and ultra wide (10 Hz to 80 kHz) bandwidth capabilities in a very affordable system.

■ Built using a one piece high pressure die-cast metal housing, the LIMPET is not only very rugged electrically and mechanically, its internal construction takes advantage of the industry's most advanced assembly techniques. ■ The LIMPET amplification system can be used with a wide range of TANNOY professional reference monitor systems, and provides the user with a number of improvements in both the performance of the loudspeaker system, and its flexibility. ■ Each single channel LIMPET system delivers an enhanced stereo image because the channels are fully separated - no power supply sagging due to inter-channel coupling, no crosstalk, no interference. Almost any kind of input level and connector can be used, since the LIMPET offers a balanced or unbalanced "combi" connector that can utilize either 1/4" or 3 pin jacks. ■ The ultra-low noise input section

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

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



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# EQ STUDIO WARE



## FORCE TO BE RECKONED WITH

If you've got an IBM PC computer with a full-length 16-bit slot, then you're the perfect user candidate for Electric Works Corp.'s DMX-4 audio switcher. This professional-quality software programmable stereo 4-channel audio switcher mounts directly to any IBM PC/A7 and has four unbalanced stereo inputs under the software control of programmable DAC devices that end in one balanced stereo audio output. In addition to stereo switching, mixing and fading controls, the DMX-4 also includes a summed mono output. There are connections for eight incoming logic closures and the ability to generate up to eight outgoing closures through software. For information, contact Electric Works Corp., P.O. Box 1-36457, Fort Worth, TX 76136. Tel: 817-625-9761. Circle EQ free lit. #117.



## YOU CAN READ

For professional audio CD one-off or archival applications, the Kodak Writable CD Audio and CD-ROM Authoring System 225 enables users to output digital audio onto custom CDs. The system includes the Kodak PCD Writer 225, which reads and writes CDs at twice the standard rate. An expandable write buffer helps to write discs more reliably by reducing the risk of buffer underruns. With the disc-at-once writing feature, the entire disc image can be created on a hard disk and written as one complete disc. Discs can be written in any standard CD format, and an internal bar-code reader allows users to take advantage of the disc identification number on Kodak Writable CD Media with INFOGUARD Protection System. Retail price is \$2850. For information, contact Eastman Kodak Company, 343 State Street, Rochester, NY 14650. Tel: 800-CD-KODAK. Circle EQ free lit. #118.

## DEEP DAWTS

If you are a user of Orban's DSE 7000 digital audio workstation, then you will be pleased to hear about the release of Version 5.0 software for the DSE 7000. Version 5.0 contains the new Time-Fit time compression and expansion system. Time-Fit lets users compress or expand an element or stereo mix by as much as 25 percent, boast the engineers at Orban. The inclusion of Time-Fit gives users the option to not use outboard boxes, and to keep compression/expansion "in-house." Other features include pitch shifting, two octave vari-speed copy, a two octave vari-speed play that keeps output sample rate constant, reverse audio, and expanded help. Version 5.0 is compatible with all DSE 7000 workstations. For more details, contact Orban, 1525 Alvarado St., San Leandro, CA 94577. Tel: 510-351-3500. Circle EQ free lit. #119.



## LISTEN TO YOUR COMPUTER

Yamaha's YST Series powered computer speakers are providing quality sound for PC users. The YST-SS1010 system features the YST-MSW10 subwoofer matched with a pair of YST-M10 speakers. The YST-M10 speakers have an output of 10 watts per channel and have full-range 3.5-inch drive units that are individually shielded so the speakers can be placed close to any magnetically sensitive equipment such as a video monitor. The YST-MSW10 subwoofer is a nondirectional speaker that features an automatic power switch. Frequency response on the YST-M10's is 80 Hz-20 kHz, while the YST-MSW10's frequency response reaches all the way down to 35 Hz. For more details, contact Yamaha, 6600 Orangethorpe Ave., Buena Park, CA 90620. Tel: 800-301-7076. Circle EQ free lit. #120.



## CAN WE SEE THAT AGAIN

The Instant Replay Hard Disk Audio Player from 360 Systems is a professional digital audio recorder that features immediate access to 500 individual audio cuts of any length. All recordings are stored on a 4- or 8-hour internal hard disk and can be high-speed transferred via the built-in D-NET file transfer network. Instant Replay features sample-rate conversion, a bright information display, AES/EBU and S/PDIF Digital I/O, analog +4 dBu I/O, and a printer port. For details, contact 360 Systems, 5321 Sterling Center Drive, Westlake Village, CA 91361. Tel: 818-991-0360. Circle EQ free lit. #121.



## PRETTY NEATO

MicroPatent's new patented labeling system helps anyone create and apply professional-looking labels to CD-Recordable (CD-R) write-once compact discs and audio compact discs. The MicroPatent NEATO CD labeling system includes a NEATO label application tool, label design templates for four popular desktop publishing and database applications, and 100 blank CD-ROM labels suitable for laser printing. It automatically centers the label on the CD, and applies equal pressure across the entire surface of the label simultaneously to avoid creasing and bubbling. The templates include Aldus Pagemaker, FileMaker Pro, QuarkXpress, and CorelDRAW, and you also get 100 die-cut gold CD labels. Retail price is \$79.95. For the deal, contact MicroPatent, 250 Dodge Ave., East Haven, CT 06512-3358. Tel: 800-648-6787. Circle EQ free lit. #122.

## HAVE YOU HEARD?

**Ensoniq** is making some cool sampled sounds for use in the ASR-10 and TS series musical instruments. The collections take on an urban theme — *Phunky Phar*, *Euro Klub*, *Hip Hop Essentials Vols. 1 & 2*, and *Techno Synths*. Each collection comes with five HD disks and manual (Tel: 610-647-3930)...Faster than a speeding bullet is what **Timeline's** DAW-80 workstation will be because of the recent inclusion of Intel Pentium processing power. No, it won't cost more, but it will provide DAW-80 users with increased performance such as screen update time and enhancement of the workstation's ability to display and operate editing functions simultaneously (Tel: 619-727-3300)...**Patchman Music** has just created four new soundbanks for Yamaha synthesizers. Volume 1 is for the VL1 and VL1-m and contains 64 new patches designed to be used with a breath or wind controller. Some new patches include improved flute, trumpet, and violins. Volume 2 is for the TX802 and contains 64 new Performances and 64 voices including New Age keyboard layers, harps, and "analog" synths. Volume 12 for SY/TG77 and Volume 15 for SY99 contain 64 Producer Analog Emulations, including analog Oberheim, Moog, and Korg. Volume 14 for the SY99 contains 64 new age keyboards. Retail prices are \$39.95, \$25, \$25, and \$25 respectively (Tel: 216-221-8887)...The Sabre Plus edit console from **Digital Audio Research (DAR)** has some upgraded features like a new easy-to-read monitor with multicolor 16-track screen display and up to 20 hours of hard-disk storage. You can even get the optional Advanced Signal Processing package that includes facilities for mixing, panning, and EQ together with aux sends and returns.

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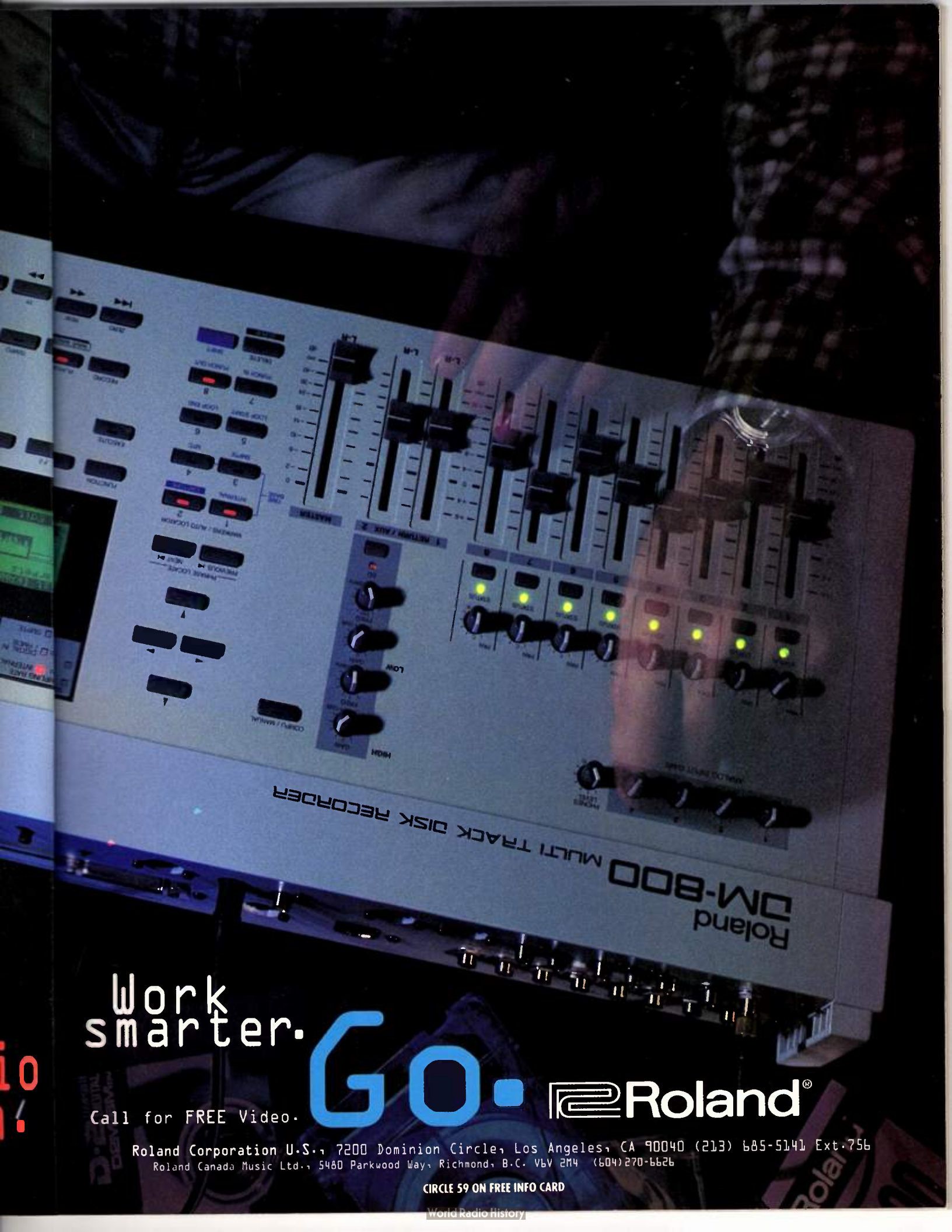
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World Radio History



# Vintage Shure

Spend your summer at this Shure line from the '30s and '40s

**MICROPHONE NAME:** Shure Model 40D  
**PRICE WHEN NEW:** \$150 (1933)  
**TYPE OF MIC:** Tube condenser  
**POLAR PATTERN:** Omnidirectional  
**FREQUENCY RESPONSE:** 40 Hz–10 kHz, ±4 dB  
**RATED SOURCE IMPEDANCE:** 200 ohms  
**MIC NOTES:** The Model 40D was Shure's first condenser microphone and one of the earliest condenser microphones to be manufactured. The body of the mic contained two tubes for the pre-amplification circuitry and several variations of the 40D were available. The 43E had the element mounted on a desk stand separately from the power supply and the 43F used the same element on a floor stand. These mics were only in the Shure line for a few years, until roughly 1938.

**MICROPHONE NAME:** Shure Model 55  
**PRICE WHEN NEW:** \$60 including shock mount (1940)  
**TYPE OF MIC:** Dynamic  
**POLAR PATTERN:** Cardioid  
**FREQUENCY RESPONSE:** 40 Hz–10 kHz  
**DIMENSIONS:** 4.25 inches high x 3.25 inches wide x 3.50 inches deep  
**WEIGHT:** 2.5 pounds, less cable  
**MIC NOTES:** The microphone shown in the photo is actually a 555, designed for broadcast use and designated by the attached shock-mount base. The standard 55 used the same element with a base similar to the one shown on the 720A and had a list price of \$42.50. This microphone (introduced in 1939) was the first single-element dynamic microphone with a cardioid polar pattern. The Unidyne 1 element, designed by Ben Bauer, also introduced the idea of using ports at the rear of the mic body to achieve phase cancellation and a directional pattern. In 1951, the 55 was discontinued and Shure began production of the 55S (the 'S' stood for small) which is still in production today. Also available were the 55A (50-ohm impedance),

the 55B (200-ohm impedance), and the 55C (35 kohm impedance). In 1947, a version was introduced that featured a small switch at the rear of the head to select high, medium, or low impedance.

**MICROPHONE NAME:** Shure Model 700A  
**PRICE WHEN NEW:** \$25 (1937)  
**TYPE OF MIC:** Crystal  
**POLAR PATTERN:** Omnidirectional  
**FREQUENCY RESPONSE:** 40 Hz–30 kHz  
**DIMENSIONS:** 2-3/8 inches in diameter  
**MIC NOTES:** The 700A made its first appearance in Shure's 1937 catalog and had a swivel-mounted head for tilting. The mic was produced until at least 1942, though available data is quite sketchy on this particular model.

**MICROPHONE NAME:** Shure Model 720A  
**PRICE WHEN NEW:** \$45 (1939)  
**TYPE OF MIC:** Crystal  
**POLAR PATTERN:** Switchable: unidirectional, omnidirectional, or bidirectional  
**FREQUENCY RESPONSE:** 40 Hz–10 kHz  
**OUTPUT LEVEL** 63 dB below 1 volt/bar (unidirectional)  
**DIMENSIONS:** 6 inches high x 2.75 inches diameter  
**MIC NOTES:** The Shure 720B "Tri-Polar" microphone used dual elements to achieve its three different polar patterns. It was Shure's first multipattern mic and used one element for omnidirectional pickup and the second element for bidirectional pickup. The two were combined to obtain the unidirectional pattern. This mic was only produced from 1938 to 1939 and was also available with a black finish.

**MICROPHONE NAME:** Shure Model 5B  
**PRICE WHEN NEW:** \$10 (1941)  
**TYPE OF MIC:** Two-button carbon  
**POLAR PATTERN:** Omnidirectional  
**DIMENSIONS:** 1-1/16 thick inches high x 3-3/4 inches diameter  
**MIC NOTES:** The Model 5B was developed in 1934 and produced until 1942. Probably the coolest-looking mic ever manufactured, the round shock mount (part # R20C) was considered an accessory and cost \$2.50. The 5B was the successor to one of the very first mics Shure manufactured (also a carbon-button mic) in 1932. **EQ**







**YEAH, SHURE:** Clockwise from top right:  
The Model 40D, 555, 700A, and 720A. Center: Model 5B.



# Live's "I Alone"

EQ speaks to engineer  
Lou Giordano on the  
recording of the song  
from Live's  
*Throwing Copper*

**EQ:** How did you go about recording the basic tracks for "I Alone"?

**Lou Giordano:** The recording process went really fast, and the take on the CD is the second of three. We recorded at Pachyderm Studio (Cannon Falls, MN), and all four band members played together. We set up a configuration where the main room was dedicated to the drums. Everyone played in this

room except for Ed Kowalczyk (lead vocalist). There was an iso booth with a lot of marble surfaces and sliding glass doors off to one side, and (guitarist) Chad Taylor's amp went in there. He had a pretty elaborate set up with three amps going at once — mainly to have the option to mix and match, but occasionally they were all used. It was mostly a Marshall JCM Series, a Fender Twin, and a Vox AC30, but we sometimes used a Groove Tubes amp as well.

**Was each amp miked separately?**

Each amp was miked separately and recorded onto a separate track. Sometimes there were three amps for each guitar part, but usually one or two of them sounded better than the others and they were printed on separate tracks. We went through a kind of discovery process where at first we spread sounds out over a lot of tracks but then we realized that certain things could get mixed together. So we started tightening it up a little bit.

**What mics were you using on the amps?**

Nothing unusual. I close-miked each amp with the typical Shure SM57 or Sennheiser MD421, and usually one mic or the other sounded good. Sometimes both of them sounded good. The Fender Twin was an open-backed cabinet and at times we had both the front and rear of the cabinet miked.

**Did you need to reverse the phase on the mic at the rear of the cabinet?**

Yes. Usually one position will sound right and the other won't, but the problem is that sometimes the rear mic is not entirely 180 degrees out of phase.

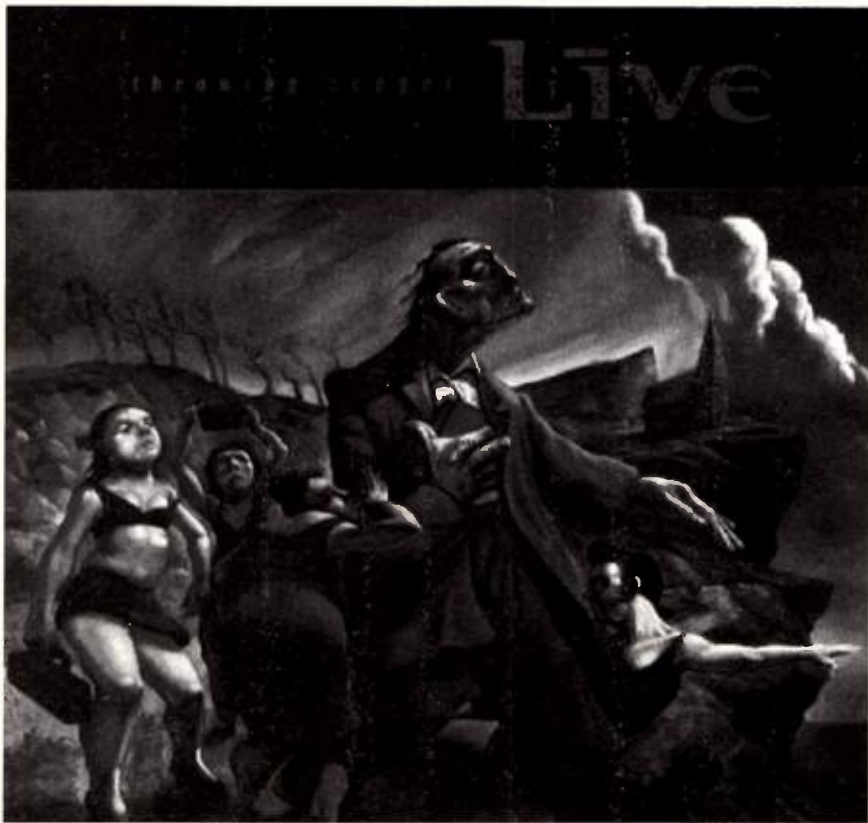
**How did you go about recording the bass?**

We used a combination of (bassist) Pat Dahlheimer's amp and a Demeter tube DI cut to separate tracks. We fooled around with time alignment between the amp and the DI. They are always a few milliseconds off, but the thing is that you usually end up delaying the DI. That takes away from the performance because the DI is exactly what the guy played, and it's the amp that is late. So for certain sections we used (producer) Jerry Harrison's Digidesign Pro Tools setup to move the amp track forward to meet the DI — it worked pretty well.

**Was the lead vocal being cut with the band?**

We were tracking vocals live and going for keepers. We had Ed set up with his guitar and a vocal mic in a little booth that looked into the main room. We used an AKG C12 for the vocal but we had to get the amp into a different area so it wouldn't leak into the C12.

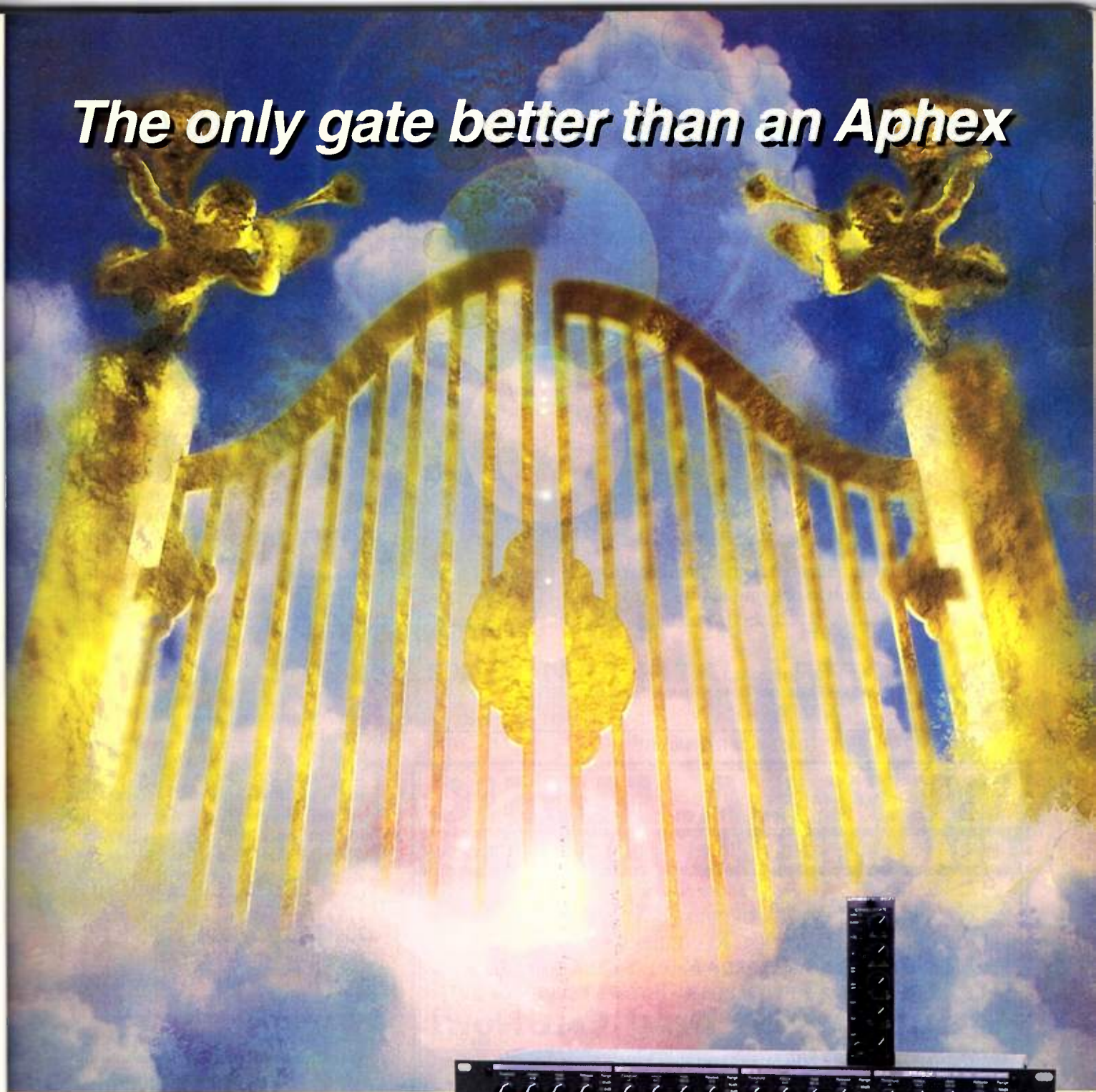
The only place for the amp was an area that was about 50 feet away. So the tech staff at Pachyderm devised this elaborate balanced line with direct boxes and transformers to get the signal from the guitar through 50 feet of concrete and mic cables. It came out in the lounge where we could set up the amp. So we tried to balance the signal before sending it down all that cable to avoid picking



PRERECORDED LIVE: Live's debut album, *Throwing Copper*.



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up noise. When Ed played loudly you couldn't hear the hum, but there were plenty of times when he played quietly and the hum was noticeable. We ended up really wanting to keep a lot of those parts. Jerry had DINR, Digidesign's noise-reduction software, so we ended up processing a couple of tracks with that to get rid of the noise. I was shocked at how well it worked. We even used it to denoise some of the vocal tracks.

**Ed's lead vocal part covers quite a lot of ground...**

Ed has amazing dynamic range, and he would go from singing really quietly to full-on yelling. I was tracking the vocals through a Hardy mic preamp simply for the reason that it had a smoothly variable gain control that could go a long way. I'd have little grease pencil marks for the verses and the choruses and I'd have to be riding them all over the place just to get the vocal on tape.

**Was compression done the old fashioned way?**

This was even before the compressor, just to get the quiet parts onto tape. I use a lot of compression, and for the vocals I like the dbx 165. It seems that it's the only compressor that's fast enough. I want the compressor to do its job and then get the signal back to where it is supposed to be. For guitar, I like UREI 1176's, and I'll compress to tape to keep it manageable. A lot of times there might be a really delicate part that you'll want to bring up in the mix and it's not going to do anybody any good if it's got tape noise.

**Was there a lot of vocal overdubbing?**

The background vocals were overdubbed, but for the lead vocal we'd keep the track that Ed had cut with the band. Then he would cut a few more takes and sometimes we'd comp together the best bits. A lot of times we wound up really digging the reference vocal, and that would become the finished track. The whole process went very quickly — the band members were real enthusiastic, and while I was setting up a mic they'd wait patiently for me to get a level. Then they'd get really excited and say, "Come on lets roll tape, we're ready!" It was genuine excitement that was contagious and got everybody worked up.

—Steve La Cerra



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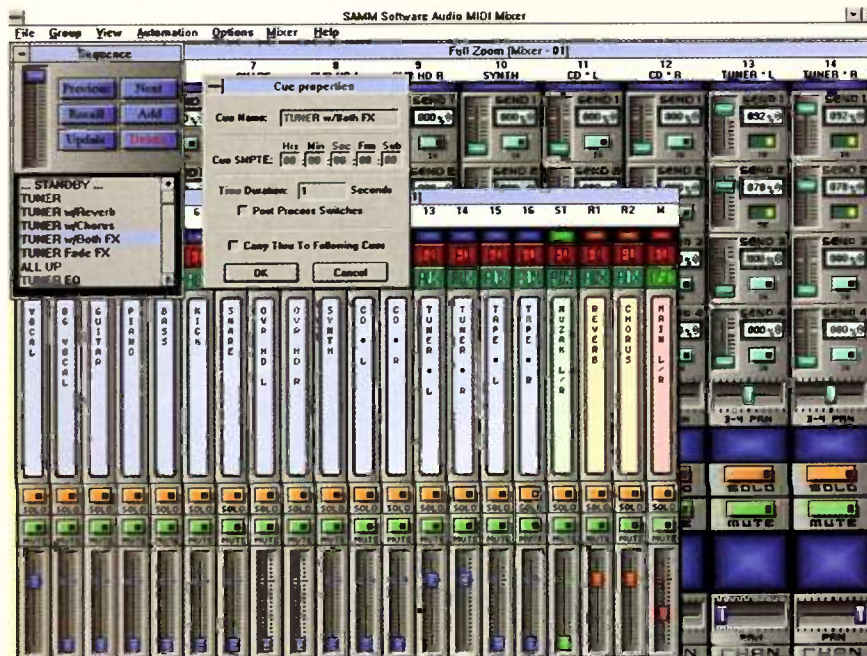
# Software Audio MIDI Mixer

Get more control  
over your ProMix 01  
with this new software

BY STEVE LA CERRA

The undeniable popularity of Yamaha's ProMix 01 MIDI-controllable mixer has led to growing third-party support. The latest on that front for PC users is Innovative Quality Software's (IQS) SAMP (Software Audio MIDI Mixer). It appears that the company plans to market versions of SAMP for different MIDI-controllable mixers, but the first version of SAMP gives users complete PC control over the ProMix 01. SAMP is designed to provide an interface that looks and feels like a hardware mixer so that total control of the ProMix can be attained quickly and relatively painlessly.

SAMP uses switchable zoom levels to provide various views of either the entire console or specific controls. The "Full Console" main screen is uncluttered and easy to understand, showing 16 mono input channels, one stereo input, two stereo effect returns, and the main L/R output (much like the ProMix itself). Each strip is numbered, has a labeling area, and shows solo and mute buttons, a fader, and small panels labeled "EQ" and "AUX." The equalization and auxiliary controls are hidden until the user switches to what IQS calls "Full Zoom." The number of input channels visible in Full Zoom is dependent upon the resolution of your monitor (a 1024 x 768 monitor shows 10 channels), but in this mode the screen allows access to the four auxiliary sends and the 3-band parametric EQ. The display gives plenty of visual feedback on the status of EQ; each channel has a EQ in/out switch, a reset-to-flat switch, and both numerical and graphic display of EQ settings (as in the ProMix itself, these



**SAMP IT AM:** Enhance your ProMix's performance with SAMP from Innovative Quality Software.

settings can be instantly recalled or copied to other channels).

Perhaps the most powerful function provided by SAMP is grouping. You can create an unlimited number of fader, mute, and solo groups with any channel acting as the master of the group. SAMP can be configured to control up to 16 ProMix 01 consoles (for a total of 288 inputs) and grouping functions can exist across multiple ProMix units (i.e., you can assign channels on more than one ProMix console to the same group). Any number of channels can make up a group, and group control can be applied to any input-channel function, including equalization, auxiliary send levels, and panning.

While the ProMix 01 has only 50 internal presets, SAMP allows storage and recall of an unlimited number of preset mix cues. Cues can be written for each section of a song with specific settings for fader levels, pan, mutes, and so on. They can then be strung together to make sequences capable of performing complex mix moves (without stressing the engineer). Since SAMP can chase SMPTE timecode, a scene change can be locked to a SMPTE number. For live situations, scenes can be stepped through manu-

ally. In addition to the standard snapshot-type of recall, SAMP can cross-fade between scenes, thus giving smooth transition of mix adjustments. Manual override of any mixer function is available at all times.

SAMP will probably appeal most to users who need automated or remote control over more than one ProMix console. But studios with more modest requirements should keep in mind that in addition to automating all of the functions normally available on the ProMix 01 itself, SAMP also adds software emulation of controls that are not built into the ProMix hardware such as auxiliary master level control and auxiliary send on/off switches.

According to Innovative Quality Software, SAMP was written using 32-bit assembly language programming, which overcomes some of the limitations of running software in the Windows environment. Standard programming techniques make it difficult to animate large numbers of on-screen controls, but IQS claims that SAMP uses this new programming technology to allow fast and detailed graphics to be handled smoothly. IQS is obviously committed to making

*continued on page 96*



# UNTIL OMAR, FRANK AND JIMMY TOLD US ABOUT OUR SERVO AMPS, WE HAD NO IDEA HOW GREAT THEY SOUNDED IN THE STUDIO.

## THE SAMSON MARKETING GUYS GET HIPPED TO THE NEW SERVO 500.

Just when we were sitting around trying to figure out why our Servo amps were selling so well, the phone rang.

"Omar Hakim is on line one," our receptionist cooed. "Shall I put him through?"

"If you don't, you're toast," we responded. "He's only the hippest drummer-composer-producer in the western hemisphere!"

"Omar, my man, what's up?"



"Uh...guys, just wanted to let you know how impressed I am with the Servo 500. It's really transparent, with lots of detail in the midrange and top end. And there's always plenty of headroom."

While we were recovering from Omar's comments, the intercom kicked in again. "Frank Aversa on line two."

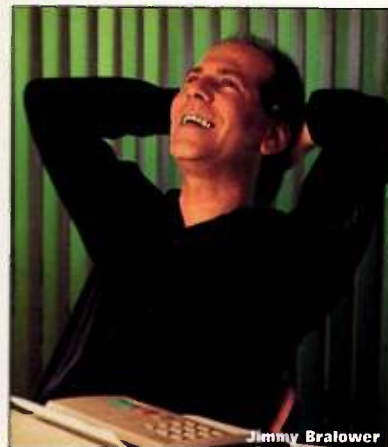
"What's the deal?" we wondered. "Frank's one of the hottest producers in the biz — he's done everything from the Spin Doctors to Burger King and Budweiser."



"I need another Servo 500 fellas," Frank said. "I already have seven, but I can't get enough of these. They sound so musical. Reminiscent of a tube amp, really smooth."

At that point, it was beginning to smell like a setup. "All right, which one of those engineering geniuses is pulling our chain now?" Just then, Sparky the marketing assistant flew into the room.

"Jimmy Bralower just faxed us about the Servo 500! Check it out: 'It really made my system come to life. I never realized my monitors could sound this good.'"



"Get outta here," we shot back. "this is too much. Jimmy's worked with people like Winwood, Clapton, and Cyndi Lauper — he even co-wrote Celine Dion's hit single, 'Misled'!"

## SOUNDS GOOD, BUT WILL ANYBODY BELIEVE IT?

At this point, Sparky piped up. "Hey, I've got a way cool idea. Why don't we use these guys in an endorsement ad for Servo? What better way to tell people how great these amps sound?"

"Never work, Sparko. Nobody will believe you can hear the difference in a power amp — unless your name is Fido," we laughed.

"Your loss, guys," he said on his way out the door. "Doesn't matter to me anymore. I just got a great offer from this new dinosaur theme park in Tasmania."



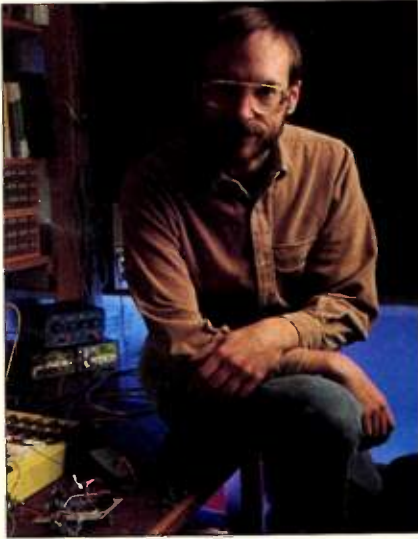
## SAMSON AUDIO

If you want our side of the story about the Servo 500, Servo 240 and Servo 150 power amps and the growing Samson Audio line, please call us at (516) 564-2244, fax (516) 564-5888 or write to us at: Samson Technologies Corp., P.O. Box 9051, Syosset, NY 11791-9051 © 1995 SAMSON

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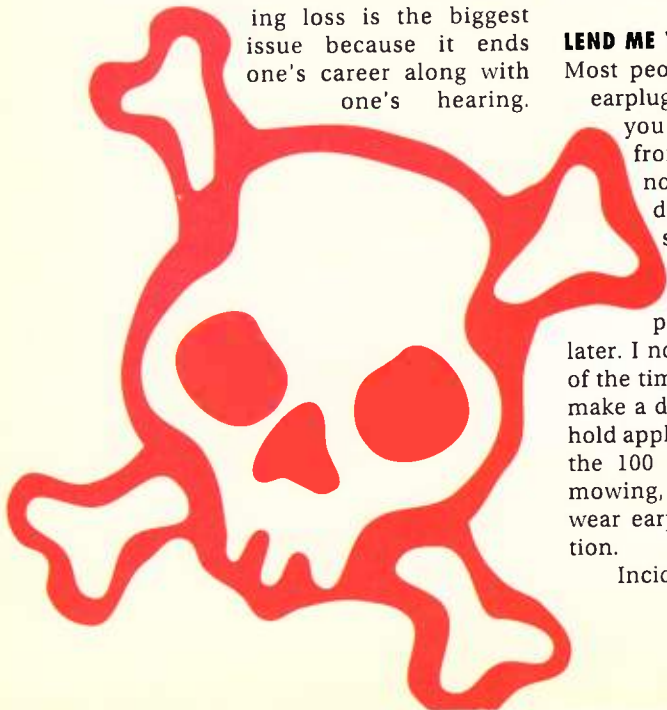
# When Killer Sound Is...Killer Sound



Use these simple health tips to record longer and keep fit

BY CRAIG ANDERTON

As musicians, we're subject to some unique health hazards that are not applicable to other industries. Of course, hearing loss is the biggest issue because it ends one's career along with one's hearing.



But there's also carpal tunnel syndrome from doing one too many edits on a digital audio workstation, breathing problems from inhaling smoke from on-stage smoke machines, having constant neck and shoulder pain from wearing too heavy a guitar, nerve compression for string players, wrist problems for drummers, and so on.

What made me aware of these issues was opening up a forum in my "Sound, Studio, and Stage" area on America Online for IFPAM (International Foundation for Performing Arts Medicine, 55 West Lindsley Road, North Caldwell, New Jersey 07006. Tel: 201-890-7874; Fax: 201-890-5421; E-mail: IFPAM@aol.com). IFPAM, which is allied with the British Association for Performing Arts Medicine and The German Society for Music-physiology and Performing Arts Medicine, is a nonprofit organization that raises money for medical research, prevention, and treatment of performance-related injuries. It has access to prominent health-care professionals, and it seemed to me that the advice and contacts presented in the forum deserved a wider audience. (Before going any further, I'd like to thank Nina Paris, IFPAM's founder, for contributing gobs of information to this article through her postings.) For example...

#### LEND ME YOUR EARS

Most people are aware that wearing earplugs to clubs is a good idea, but you need to protect yourself from other sources of loud noise. I noticed once that if I did a mix within 24 hours or so of taking a long plane ride, the mixes would always sound overly bright when I played them back a few days later. I now wear foam earplugs most of the time I'm on planes, and it does make a difference. Even some household appliances (like blenders) can hit the 100 dB mark; for drilling, lawn mowing, hammering, and the like, wear earplugs as well as eye protection.

Incidentally, because of a misin-

terpretation of OSHA guidelines, some people believe that exposure to anything under 90 dB is safe. However, duration is important, too. According to IFPAM, 25 percent of the people who are consistently exposed to levels of 85 dB will develop a hearing loss as a result. This isn't just a problem for rock musicians: a choir can generate 80 to 100 decibels, and orchestral instruments can hit well over 100 dB. In fact, it's not uncommon for orchestral musicians who sit near the percussionist or wind section to have hearing loss on that side.

For more information on earplugs, IFPAM recommends H.E.A.R. (Hearing Education Awareness for Rockers), a nonprofit organization started with backing from Pete Townshend (P.O. Box 460847, San Francisco, CA 94146; the 24-hour hotline number is 415-773-9590). They can recommend audiologists who custom-fit "high-tech" earplugs for musical applications.

One of the most popular brands for these is Etymotic Research, with 15 and 25 dB cuts available. Although custom earplugs cost \$100 to \$150, this is the cheapest insurance you'll ever buy for your career's longevity. They really do work, and require only a short period of getting acclimated.

Another organization devoted to hearing is the House Ear Institute (2100 West Third St., Fifth Floor, Los Angeles, CA 90057. Tel: 213-483-4431; Fax: 213-413-6739). I have a very good friend who was losing hearing in one ear; he went to HEI for testing and found out just in time what he needed to do to prevent any further deterioration. (By the way, he thinks the problem was caused by spending a huge number of hours driving with the driver's side window open, blasting air into his ear.)

#### STEALTH HEALTH

Hearing is just one problem; there are often muscle and nerve problems caused by overpracticing or the wrong kind of exercise. For example, if a drummer has a certain kind of elbow pain that involves the nerve, then starts lifting weights to "strengthen" the muscles, that may only make





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things worse. Probably straightening out the arm more often would help — which means rearranging the drumset so the cymbals are further away. However, if the drummer's pain is from an elbow muscle problem, then reaching out further to strike the cymbals may cause further deterioration. Although performing arts medicine is not quite as far along as sports medicine, here are some useful references.

*The Musician's Survival Manual-A Guide for Preventing and Treating*

*Injuries in Instrumentalists* is written by Dr. Richard Norris, director of the Performing Arts Medicine Program at the National Rehabilitation Institute in Bethesda, Maryland. Dr. Norris is a former dancer, as well as a karate expert, physiatrist (doctor of physical medicine and rehabilitation), and performing arts medicine specialist.

Dr. Norris also has a video, *Therapeutic Exercises for Musicians*. It's not MTV and gets off to a slow start, but be patient — there's a lot of useful infor-

mation. In this video, Dr. Norris demonstrates the use of the Theraband (which resembles a huge rubber band) to do resistive exercises. The Theraband is a great warm-up tool for musicians because it's simple, transportable, and affordable.

Both the book and the video can be ordered from MMB Inc. (Tel: 800-543-3771). The book is \$16.95, the video \$35 (both plus shipping and handling).

Therabands, made by Northcoast Medical, have eight varying degrees of resistance and come in 6-yard rolls; prices range from \$7.95 per roll for extra thin to the \$26.50 for the strongest. IFPAM recommends three of the middle grades for men (heavy, extra heavy, or special heavy). Remember, you don't want maximum resistance because you're not trying to develop strength as much as endurance. IFPAM does not recommend the usual wrist strengtheners, including rubber sponges for squeezing. Don't stress the wrist; for good endurance training and strengthening, just increase the number of repetitions rather than the amount of resistance.

The Theraband is available from Access to Rehabilitation, 2509 E. Thousand Oaks Blvd., Suite 430, Thousand Oaks, CA 91362 (Tel: 805-498-7535), as well as from local medical supply companies. The Theraband is just now being made available to the general public and not just therapy clinics, so you may need to look around a bit.

**THE LAST WORD**

It's common not to think about these problems until damage has been done, at which point you may be too late. Take preventative measures now to protect your health, and you'll have a longer, and happier, career.

(Thanks also to the following contributors on AOL: SLINGSHOT9, MrRUE, and BruceMIDI. To interact with IFPAM on AOL, use keyword "SSS" then click on Voice of the People to access the forum folder, or Industry News to access IFPAM news and articles.)

*Craig Anderton not only lives in cyberspace, he has a gig there. America Online subscribers can access articles, samples, news, and forums in "Craig Anderton's Sound, Studio, and Stage" area. Use keyword SSS or ANDERTON.*

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CIRCLE 03 ON FREE INFO CARD



# A Guitar of COSMic Proportions

The Roland VG-8 V-Guitar System opens up a new galaxy of possibilities for the project studio recordist

BY CRAIG ANDERTON

What's a review of an electronic guitar doing in *EQ*? Simple. The Roland V-Guitar System is a really significant development for the project studio, not just live performers.

What Roland has done is create a hex pickup (one output per string) that works with just about any guitar. This feeds a floor box (complete with footswitches) full of electronics that creates computer models of particular

types of sounds — guitars, pickups, amps, mic placement, signal processors, etc. — then analyzes the real guitar string, and plugs the numbers that result from this analysis into the model.

As a result, the sounds the VG-8 models relate directly to your playing. Finally, we have an electronic guitar without tracking problems (because there is no tracking) and that reproduces extremely subtle nuances without glitching. No special playing technique is required. In fact, sometimes it's easy to forget that you aren't really hearing the output of your guitar (unless you mix some in with the modeled sound).

Before going any further, note that this is not a MIDI guitar box. It includes MIDI to send and receive program change, bank select, and system messages, but the VG-8 outputs audio, not data. This is not a box for making piano sounds or dog barks; it is an electronic guitar that, as a bonus, gets some synth-like sounds thanks to 13 modeling algorithms Roland calls Harmonic Restructure Modeling (HRM).

This is a studio musician's dream come true: you can go from a clean Strat sound, to a Les Paul through a stack, to a banjo, to some weird resonant lead sound you've never heard before, to a Rick 12-string, to modified tunings, and a lot more. Want to create a virtual instrument and throw the pickups out of phase? Or place the pickup anywhere, even on the neck up to the 12th fret? Go ahead.

The VG-8 is extremely exciting. It's not perfect, but remember that this is the first of a new generation of products. If Roland keeps pursuing the V-Guitar System technology (they call it COSM), I can't wait to see what shows up at future NAMM shows. Let's explore further.

## THE SYSTEM

You need a standard electric guitar, Roland GK-2 or GK-2A hex pickup, VG-8 floor box, and a special cable to interconnect the hex pickup with the box. The stereo outs can drive amps or phones. (Note that Fender, Ovation, and Godin make Roland-compatible guitars with the pickup built in.)



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automations, experiment with crossfades and EQs, and more. In addition, Session is built on the Digidesign Audio Engine (DAE™), fast becoming the development standard for all digital audio workstations for the Macintosh.



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## TECHNIQUES TECHNOLOGY

The GK-2A pickup is more compact than its predecessors, and mounts in a variety of axes (Strats work great). The pickup goes right next to the bridge, and a small control unit (with a jack for the special multiconductor cable) mounts on the guitar. The cable/control unit connection seems somewhat flimsy; if you're going on the road, bring a spare GK-2A and cable for insurance.

### THE SOUNDS

Does the VG-8 do a flawless imitation of every classic guitar sound? No, although it's scary how close it gets. What it does do is put more guitar processing power in one place at one time than any other guitar synthesizer or signal processor I've seen. Some of the distortion sounds are not quite as detailed or smooth as the source sounds being emulated, but the number of options — and the quality of the emulations — is astonishing. My only real complaint is a few remaining rough edges on some of the distortion, but you can do a lot to tweak them more to your preference.

Going through the factory presets (banks A and B, for 64 patches total) gives a good idea of the options. There are 64 additional programs loaded into user (RAM) memory, so save these (either to the optional 64-preset memory card or MIDI) before you erase any; some of them are cool.

One hint: the VG-8 has an effects section with echo, reverb, and modulation (chorusing). This is overkill on some factory patches; taking off reverb and delay (function keys F5 and F6) on certain patches gives an improvement — the sound is more "in your face" and guitar-like. This is particularly true for the "out there" sounds, which often swim in reverb to the point of becoming indistinct.

Having said that, if you're a little more subtle, the effects are far more helpful. The hex panning, tremolo, and chorus variations are a lot of fun, as is the option to "tap tempo" to set the modulation rate and delay time.

And, of course, you can always turn off all the effects and run through some mondo processor for top-quality reverb and chorusing.

If you can't take the time to go through all 128 patches when you test the VG-8, at least check out these user-bank patches:

A22: Open D tuning for steel players, or if you want to get lazy and just barre chords. A33: Nails the sound of the late, great Mutron biphase. A34: Take off delay and reverb for killer slow-ballad chords. B11: Modified Nashville tuning — yummy! B23: Wonderful bass sound, but remove reverb immediately. Also try B31, 32, 33. B34: How many commercials will have this sound within six months? B54: One of the most expressive articulated patches; doesn't sound remotely like what it's supposed to, just play lead and enjoy. B61: Hard sync synth sound. B74: Nice 12-string (also check out A82), but I would like to hear more of a delay between the main and octave string (octave delayed for Fender and Gibson, main delayed for Rickenbacker). B81: Play block chords and stand back. Good brass replacement.

Does the VG-8 do a flawless imitation of every classic guitar sound? No, although it's scary how close it gets. What it does do is put more guitar processing power in one place at one time than any other guitar synth I've seen.

### EDITING TIME

Whenever I wasn't knocked out by a sound, I'd delve into the editing options, and, most of the time, could adjust the sound to my liking. Now the big news: I figured out most of the system without even cracking the manual, thanks to an obvious operating system and some cute little icons in the display to keep me entertained. (It's still worth reading the manual to pick up some not-so-obvious tips.)

There are some limitations. You can't, for example, create your own algorithms. So if you want something like compression, you won't get it unless it's in the algorithm. The EQ is versatile, but fixed at the signal chain output. Still, you have a wide range of control. For a typical algorithm you can choose four different amp types (plus off, each with its own set of tone and other controls); noise gate; three differ-



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ent speakers; three types of mics; three mic positions; four pickup types with tone controls and selector switches (including a two-pickup mode where you can create a single-coil or humbucker pickup and throw it off phase, angle it to an absurd degree if desired, and move it anywhere on the neck); pitch shifting (individually adjustable for different strings; great for programming open tunings); and more. Other algorithms have other parameters. For example, some algorithms have an adjustable "pedal" (distortion, overdrive, metal, compressor, or limiter, all with multiple parameters).

The main nonguitar algorithms have a resonant, buzzy character that can be extremely cool once you've edited it to fit your style and touch. Several sounds that I didn't like out of the box became just what I wanted after a little tweaking; even sounds I did like were worth playing with, as it was fun to come up with variations on a theme. However, the HRM algorithms do tend toward a certain buzziness in the sonic character; don't expect extreme amounts of variety.

**A WORDS TO PURISTS**

Some Strat fan who plays through a Marshall stack will walk up to a VG-8, punch up the "Strat Through Marshall" sound, and derisively say it doesn't sound like a Strat through a stack. Well, there are still a lot of variables for individual setups that aren't available for variation in the VG-8: string gauge, guitar wood type, glue used in speaker cabinets, etc., so it may not sound exactly like your Strat, but it will be very close.

Basically, what we have is the guitar equivalent of the keyboard synthesizer. A synthesized piano doesn't sound like a piano, but not only can the synth come fairly close, it can do things real pianos can't do. The VG-8 works similarly; although, I must say that the VG-8's accuracy in translating nuances makes keyboard synthesizers and samplers look stiff by comparison.

Doubling the straight guitar sound, especially if it's going through some favorite processors, and layering it with the VG-8 can produce some exceptionally huge, ringing sounds. Don't overlook this option.

Another useful item is an accessory pedal; you can program a parameter to be controlled for each program. There are other goodies, but let's wrap this up so I can get back to playing with the VG-8...

**SO AM I IMPRESSED?**

You bet. Every now and then a product comes along that really does what it's supposed to do, and does it real well. Even rarer is a product that does all that and breaks radically new ground. The VG-8 is just such an animal.

No company has stuck with a vision of the electronic guitar as tenaciously as Roland, and now they've made the quantum leap that MIDI guitar could never make. Give yourself a treat: go check out the VG-8. And if you can't afford it, don't worry. I bet this thing is going to take off, and within a couple of years we'll see lower-priced versions of what is destined to become a very successful technology.

*For more information, contact Roland, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: 213-685-5141. Circle EQ free lit. #123.*

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CIRCLE 55 ON FREE INFO CARD



# What Happened To My Tapes?

Part 1: Sometimes, no matter how much care you put into archiving, the results can be monstrous

BY ROGER NICHOLS

**W**e have been in the digital audio age for about 15 years now. There are still arguments about whether digital sounds better than analog, or analog sounds better than digital. Only I know the true answer to that question, and I'm not tellin' — so there! One thing is very clear, however, and that is the fact that the sound recorded on analog tape changes over time, but that the information on digital tape does not.

Many companies transferred their catalogs of analog tapes to digital many years ago. I transferred the Steely Dan analog masters to 3M digital format in 1981. By transferring the tapes early in the "digital age," any further analog deterioration was halted. More recently, the early 3M tapes were transferred to CD. The 3M tapes were marginal in their ability to play back correctly, and finding a machine to play them on was a task in itself. Because the data was digital, it was possible to recover the albums completely with no further degradation during the additional 14 years of storage.

Digital storage technology has come a long way in the last 15 years. Future-sighted companies who transferred their masters years ago are ahead of the game. If you transferred an analog tape to digital 10 or 15 years ago and played them both back today, the digital would sound much better because the analog tape has continued to deteriorate, while the data on the digital tape has not.

The good news about digital tape



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is that the audio will either play back perfectly, or not at all. The bad news about digital tape is that the audio will either play back perfectly, or not at all. It is becoming increasingly apparent that early digital tapes are not playing back as well as they should be. It is usually not the entire tape that fails to play back, just the most important portions of your expensive master. Digital formats such as Sony 1610 and 1630, Mitsubishi X-80 and X-86, Sony 3402, 3M 4-track, Soundstream, JVC, Sony F-1, and now DAT tapes are failing to play back as well as they did years ago when the tapes were recorded.

Here are some of the problems that have come up regarding various digital recording formats.

#### THE F-1 FORMAT

F-1 format tapes actually cover a variety of different systems. The format was originally the EIAJ format for consumer digital audio. The format is specified to be 14-bit. There were machines available from Technics and other manufacturers that included the digital processing and a VHS-format video transport in a single unit. The audio was recorded as a video signal consisting of little black and white dots that, when played back, were turned back into digital information and exited the machine as audio.

Soon after came the Sony F-1 with a modified version of the EIAJ format. There was a switch that let you decide whether you wanted to record 14-bit or 16-bit. Everyone who owned a Sony F-1 selected 16-bit. The problem with selecting 16-bit was that the extra bits were recorded in an area that was used for error-correction data in the 14-bit mode. If you recorded 16-bit, then you were more likely to encounter uncorrectable errors. There was a unit produced by Sony for Nakamichi called the DMP-100. Some capacitors were different and the outside was black instead of silver. Otherwise it was a Sony F-1. Sony also produced the PCM-501, PCM-701, and PCM-601 (with digital inputs and outputs). The tapes produced were identical.

#### F-1 PROBLEM #1: BETA-VHS WARS

Some people who recorded using the F-1 format decided that since VHS was a better video format than Betamax, then the digital audio recording would be better when stored on VHS tape.

The reality of the situation is that they basically shot themselves in the foot. All Beta machines have a switch on the machine labeled "PCM." When PCM was selected, the video drop-out-compensator was disabled, allowing the F-1 processor to perform the error correction necessary to recover the digital audio. If the switch was not in this position, then the video deck would perform video-type error correction, which would increase the digital audio errors by about ten times. This would cause quite a few uncorrectable errors resulting in poor digital audio recovery. VHS machines do not have a switch that allows you to disable the drop-out compensator. Without using a specially modified VHS transport, the error rate will easily be above the threshold for correctability.

#### F-1 PROBLEM #2: EMPHASIS

Unmodified F-1 (all types) processors operated with "emphasis" added to



the digital audio signal. Emphasis was some engineer's bright idea that if you emphasized the high frequencies during the recording and then reduced them during playback, that you would have a quieter recording. Not true. By employing emphasis, you usually had to record at a lower level, thus negating any apparent noise reduction due to the emphasis. Sony 1610 and Sony 1630 recorders have the ability to record with emphasis also, and the earliest CDs were produced with emphasis turned on. It was later learned that it was best to record without emphasis. No CDs made today have emphasis (unless by accident). There were some F-1 processors that were modified to record with no emphasis. This fact was usually not marked on the tape box.

#### F-1 PROBLEM #3: WRONG SAMPLE RATE

Because the F-1 processors were designed to use standard video decks as the storage medium, they were designed to produce the video image at the standard video frame rate. In the U.S. this is 29.97 frames per second.

This meant that the sample rate was not really 44.1 kHz, but actually 44.056 kHz. F-1 processors designed for PAL and SECAM format video were 44.1 kHz.

Some F-1 users modified their F-1 boxes to actually record at 44.1 kHz. This was easily done by replacing the main clock crystal in the U.S. versions with the crystal used in the PAL/SECAM units. U.S. video machines have enough tolerance so that they will run a little fast to keep up with the frame rate during record. The fly in the ointment here is that when a consumer video deck is in play, it uses the crystal built into the video deck. The audio that was recorded at 44.1 kHz is now playing back slow, at 44.056 kHz. The only way to play back the signal properly is to use a professional video deck that will accept an external reference for playback. This deck can be sped up to 30 frames per second to play back the audio at 44.1 kHz.

#### F-1 PROB #4: TIME SHARED CONVERTERS

The F-1 series of processors used one A/D converter and one D/A converter to process both channels. The converters would sample one channel and then sample the other channel. This meant that there was a half sample delay between the left and right channels. The exact same thing happened during playback, so there was no big deal. When F-1 tapes were transferred digitally to Sony 1610 or 1630 format for CD production, there was a phase discrepancy between the two channels because the Sony 1630 (the standard for CD masters) processes both channels simultaneously.

#### F-1 PROBLEM #5: DC OFFSET

This problem is lumped in here with the other F-1 problems, but it also affects tapes produced by Soundstream, Sony 1610, Mitsubishi X-80, 3M 4-track, and other early digital machines. The problem is DC voltages present on the digital tape. The DC voltages are necessary to make the analog-to-digital converters perform their job better. The DC voltage, or off-



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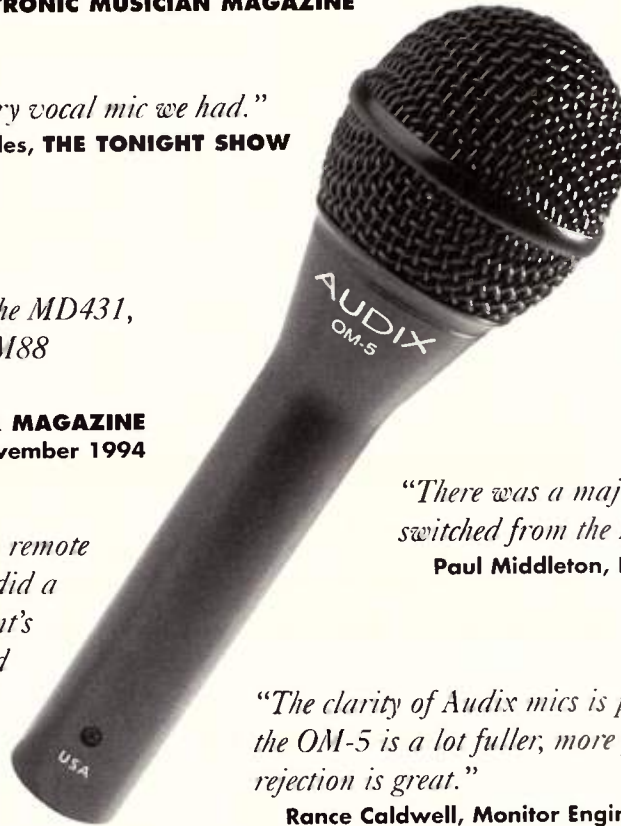
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set as it is also called, lowers the zero-crossing (low level) noise in digital recordings. Some digital machines required a relatively high offset voltage to make the converters sound good. The Soundstream machine was one of the worst.

This DC offset caused pops and clicks at the beginning of a CD and when you skipped to another track. If



there was an edit performed between two takes with different offsets, there would also be a click. If the DC level was high enough and you had the volume turned up, the thump could damage your speakers. It was decided that every effort should be taken to remove DC offset voltages from CDs. The DAT standard specifies that there will be no DC recorded on tape. Any DC used in the conversion process should be removed before the digital audio is stored on tape. Current Sony 1630 processors, as well as other digital formats, adhere to that requirement.

#### SAMPLE RATE PROBLEMS

Early in the digital wars, there was no sample-rate standard, except for the CD specification of 44.1 kHz. The professional machines could be whatever they wanted to be. The Mitsubishi X-80 was 50.4 kHz. The first two X-80 machines were owned by George Duke and Roger Nichols. Their machines were used on many projects besides their own, and they turned out many

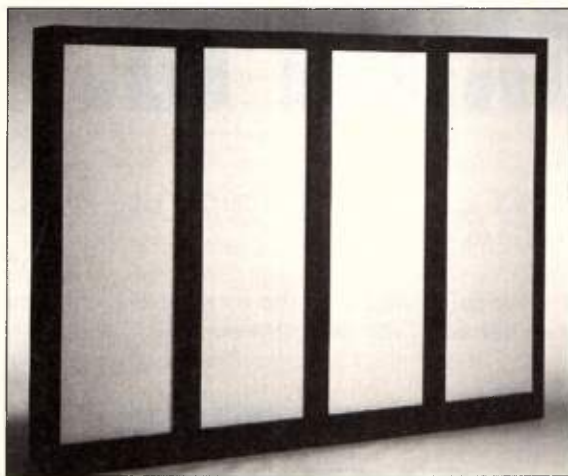
50.4 kHz tapes before everyone decided on 48 kHz as the professional sample rate.

The 3M Digital Mastering System consisted of a 32-track machine and a 4-track machine. The 4-track machine was used to perform edits and to store the final master during mixing and mastering. The 3M sample rate was 50 kHz. Later, there was a modification available that allowed the machines to be switched between 50 kHz, 48 kHz, and 44.1 kHz. Not many people purchased this modification, and to remain compatible with other 3M machines almost every 3M user stayed with the 50 kHz sample rate.

We have already talked a little about tapes that were recorded at 44.056 kHz. This was not just an F-1 problem, it also crept up whenever a project was referenced to video. Until recently, any recording done while synced to video was "pulled down" to the video rate of 44.056 kHz or 47.952 kHz. Yet another sample-rate nightmare.

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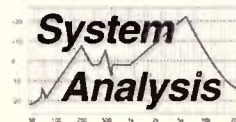
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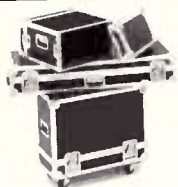
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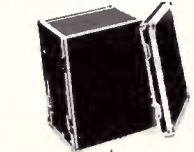


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## TECHNIQUES ARCHIVING

### TAPE ON WRONG MACHINE PROBLEM

If you don't read the labels on a tape box, one tape can look pretty much like any other. A Sony 1630 tape looks like a 3/4-inch videotape because it is a 3/4-inch videotape. Because of the nature of the data stored on 1630 tapes, trying to play one on a regular video machine can cause plenty of problems. Wrong tensions, dirty heads, maladjusted tape paths, or any number of other problems can damage a tape so that it can't be recovered without a lot of work. The same is true of VHS and Beta format digital audio tapes. One pass on the wrong machine can spell disaster.

3M 4-track digital tapes are 1/2-inch wide. I have personally seen a 3M 4-track tape placed on an analog 1/2-inch machine. When the tape wouldn't play, the machine operator fast forwarded to another spot on the tape. It wouldn't play there either, so the tape was rewound and placed back in its box. The damage was done. The tape would never again play back properly on the correct digital machine. The same thing has happened with 1/4-inch digital tapes.

Digital tape is much thinner than analog tape. The reasons for using thinner tape are better head contact and longer playing time. Because the tape is recorded with digital information, there is no "print-through" as there is with analog recording. Usually digital machines require higher recording speeds to record the digital information on tape. The 3M machines record at 45 inches per second. Digital machines are designed to transport thinner tape, so the tape is wound on the reels properly during fast forward and rewind. Analog tape transports are not set up to handle the thinner tape, so when thin tape is used, the wrap on the reels is very ragged and the edges of the tape are wrinkled. This is not a good thing for digital tape. Excess errors will show up when the tape is played on the digital machine. Digital tape is easily stretched or broken when wound on an analog machine.

### WRONG SPlicing TAPE PROBLEM

Some digital machines allow you to edit the tape with a razor blade. The Mitsubishi X-80 was the most common for razor blade editing of digital audio. There have been edits performed on the 32-track Mitsubishi X-800 series, as well as the Sony 3324 24-track

machine. The edits had to be very precise, and no residue from finger prints or other contaminants were allowed.

In analog editing, the tape is cut at an angle, the pieces are butted together so as to leave no gap, and a piece of audio splicing tape is used to secure the edited pieces. When editing digital tape, the cut must be vertical and a small gap, about the width of a razor blade, must be left so that the digital machine can detect the edit. In addition, the splicing tape used must be "digital" splicing tape. Digital splicing tape is different from analog splicing tape. First of all, digital splicing tape is thinner and more pliable to allow proper head contact at the edit point because the tape being spliced is so thin. Second, the adhesive is different on digital splicing tape. Because there is a gap left at the edit point, a small amount of the adhesive shows through the splice. This adhesive spot comes in contact with the head as it passes during playback. The adhesive cures so it does not leave behind any residue. Any residue that got on the oxide face of the digital tape would cause tons of errors — not what is needed for a good digital edit.

The reason I bring this up is that almost half of the edits I have ever run across on digital tapes were done with analog splicing tape. The edit may have played back right after it was performed, and maybe even for the next few weeks, but after the tape has sat around for awhile, the adhesive has crept through the gap at the edit point. The next time the tape is played, the adhesive will transfer to the heads and guide rollers of the digital machine and then transfer gunk for up to ten seconds on either side of the edit. The error lights will come on like the lighting of the White House Christmas Tree.

### DAT MACHINE ALIGNMENT

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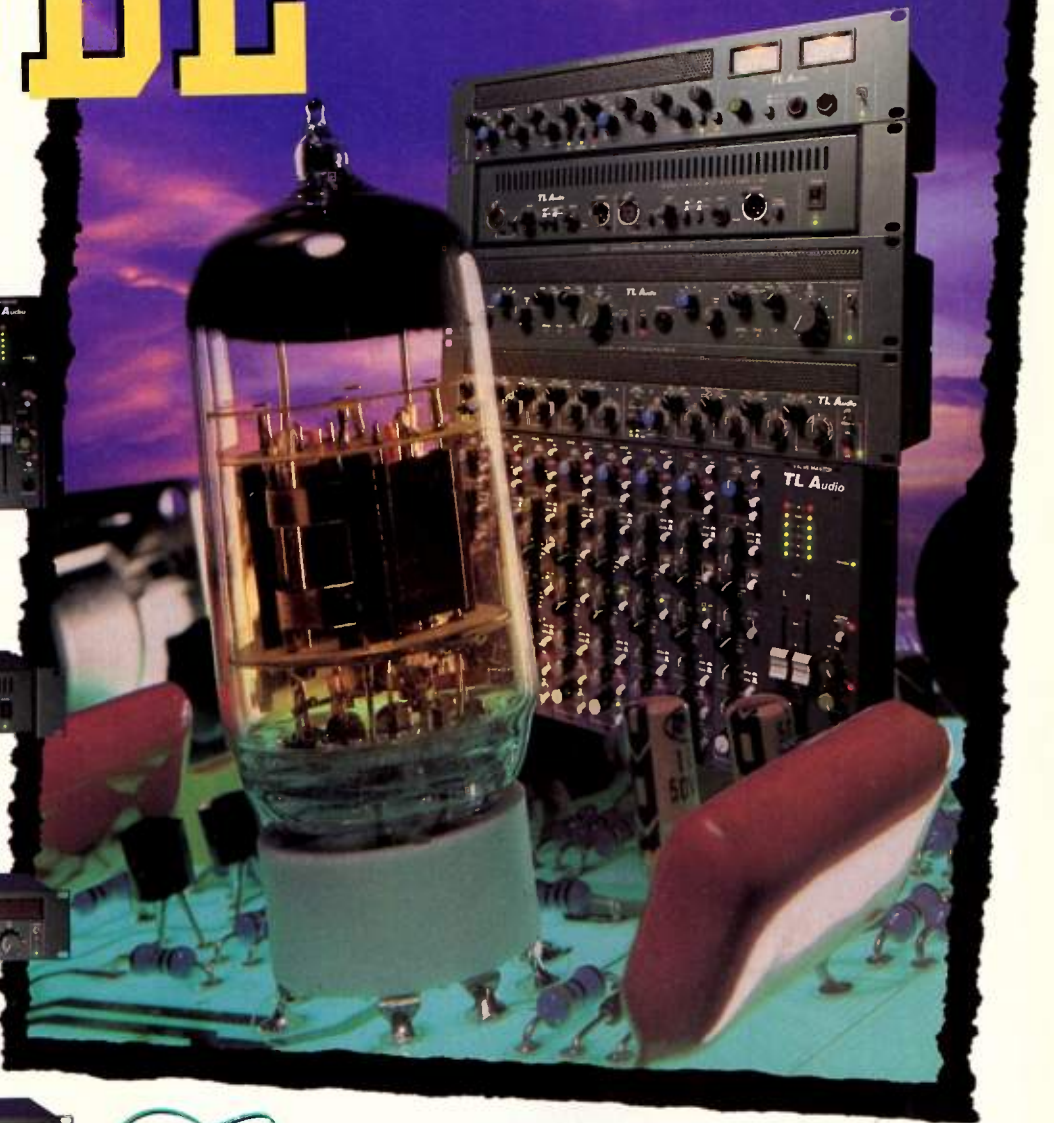
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machines were much cheaper than the \$20,000 reel-to-reel digital machines that you mixed to, so many record masters only existed on DAT tape. DAT tape was designed as a consumer format, and, as such, does not have all of the extra protection that may have been deemed necessary for professional use.

DAT machines are not all aligned to the exact center of the allowable tolerance for DAT transports and head alignment. It happens all the time that a DAT tape that plays back perfectly

on one machine will play back poorly on another machine. If there is a transport problem with the record machine, the chances are even less that the tape will play back 100 percent on another machine.

**DAT TAPE QUALITY**

DAT tape quality range is unbelievable. Some tapes I have run across would not make it through the machine once. Part of the tape problem is actually problems with the shell that contains

the tape. If the shell binds the tape at all while you are recording, then chances are that the tape will not play back properly. Sometimes the tape and shell are fine initially, but warpage of the shell at a later time makes playback almost impossible.

**DAT PAUSE EDITING**

This problem rears its ugly head when the artist or producer tries to perform edits by using two DAT machines. The record machine is placed in Pause-Record, and, at the proper moment for the edit, the deck is taken out of Pause to record the continuation of the edit. When the DAT tape is played back, the edit is perfect. This also happens when an album project is assembled into the proper sequence by copying from one DAT machine to another. The proper spacing between tunes is accomplished by using this same Pause editing technique. Everything plays back just fine on the original machine. When the tape is played back later on a different machine, however, the beginning of each tune sounds like part of it is missing. Well, it is missing. Because the alignments of the record machine and the playback machine are not identical, the play machine cannot track correctly over the Pause edit and the machine mutes for a split second. By the time the playback machine has recovered from the error, part of the start of the song is missing.

**DAT HARD DISK TRANSFERS**

Problem number four is a result of transferring digital audio from a hard disk editing system to a DAT tape. It is not the transfer of digital audio information that causes the problem. The problem is caused by a combination of errors on the part of the operator of the hard disk editor and a problem with some early DAT machines. Some DAT machines look at an incoming "sample rate flag" and record that flag on the DAT tape. That flag is used by the DAT machine for playback speed. Other machines actually look at the sample rate coming in to the DAT machine to decide what flag to record along with the digital audio information. It is possible to record something at 48 kHz but have the flag on the tape set for 44.1 kHz. In some hard disk editing systems it is possible to have the flag set one way and the sample rate set the other way. When you go to

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play back the DAT tape, some DAT machines will play back one way, some will play back the other way, and some will simply mute or stop the transport because of an illegal combination. There were some machines that when faced with an incoming signal like this would act like they were recording, show the digital audio on the meters, and send the audio out the analog outputs, but when you went to play the tape back, it would be blank. If you just made the copy without listening back to it, you would never believe that the tape was blank.

**DAT AND EMPHASIS**

One final DAT problem: Some early DAT machines, such as the Luxman, recorded with emphasis on. DAT tapes that were transferred digitally from F-1 tapes would also contain emphasis. Some transfer boxes, such as those used to transfer digitally from ADAT 8-track machines and some sample-rate converters, turn the emphasis flag off, but the tape still contains emphasis. This causes the tape to sound unusually

bright on playback. This problem needs to be remedied during the transfer.

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Mitsubishi has discontinued the X-80 and X-86 2-track machines, as well as the X-800, X-850, and X-880 32-track PD format machines. Otari was building PD format machines, but at this time it will only custom-build a machine after the sale. Otari did not make a 2-track reel-to-reel digital machine.

The only current digital multi-track format is DASH. This is supported by Sony with the 3324-S 24-track machine and by both Sony and Studer 48-track machines.

The Sony PCM-10 14-bit digital 2-track was discontinued in 1982 with *continued on page 96*



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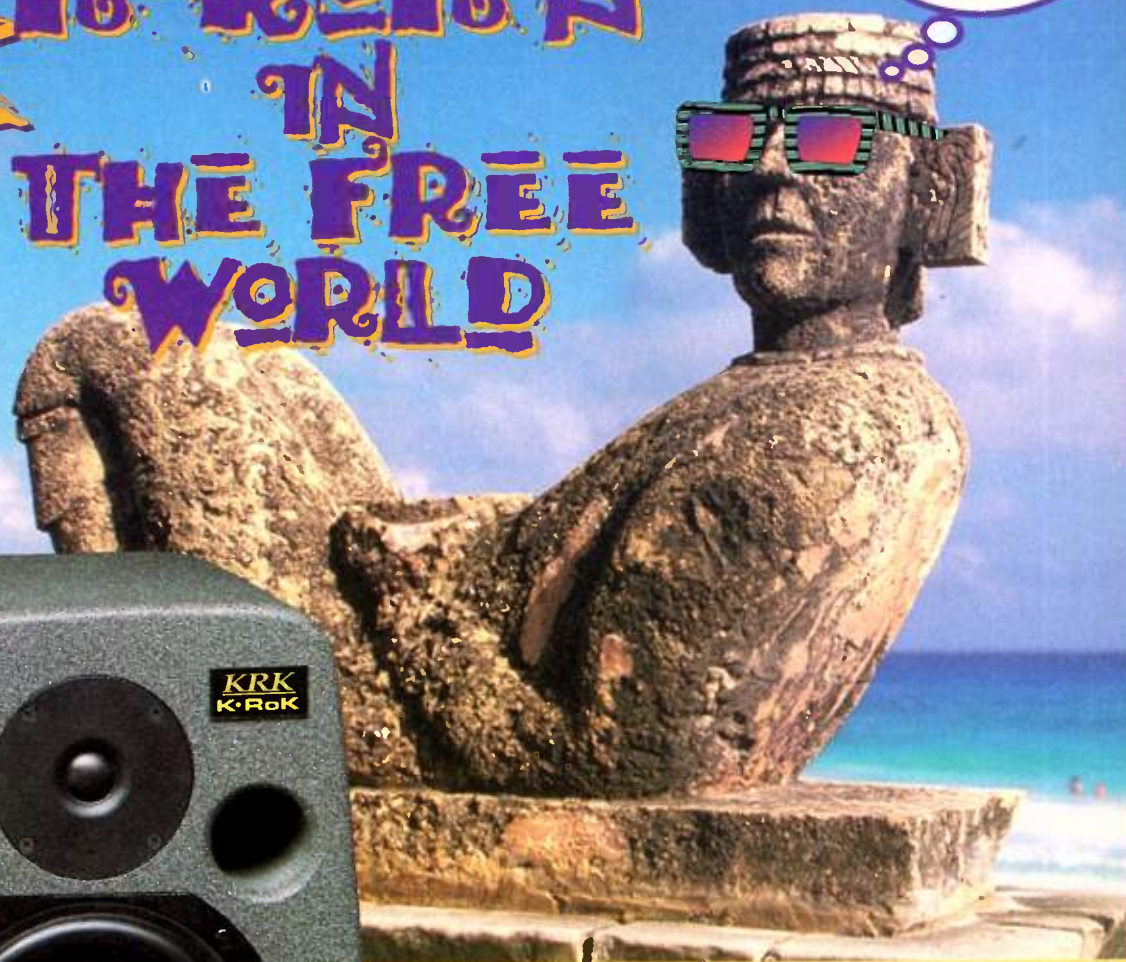
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# STATE OF



**LISA STANSFIELD RENOVATES HER HOME WITH CARE AND A RUPERT MURKIN RE-DEVELOPMENT**  
**BY PATRICK STAPLEY**



# OF GRACIE



NOVAS HER PROJECT STUDIO WITH A LOT  
RT RE-DESIGNED AMEK 9098 CONSOLE





## STATE OF GRACIE

Rochdale in West Lancashire is famous for a number of things — other than asbestos and England's first supermarket, the town is also the birthplace of '40s film star Gracie Fields (born Grace Stansfield 97 years ago), and more recently, Lisa Stansfield (born Lisa Stansfield and apparently no relation).

Like "our Gracie," "our Lisa" shares the same "local lass done well" image and has become something of a hero in this down-to-earth, Northern town. But apart from putting Rochdale on the map by virtue of being born there, Lisa Stansfield has also built a top-end studio in her home town that has recently been equipped with the world's first Amek/Rupert Neve 9098 console.

The studio, affectionately known as Gracieland, but more plainly referred to as the Rochdale Studio, has been built on a disused tennis court in Lisa's boyfriend's mom's garden. Lisa's boyfriend, Ian Devaney, is also her producer, co-writer, keyboard player, programmer, and general confidant.

Prior to becoming an artist in her own right, Stansfield was in a little-known band with Devaney called Blue Zone. "When we first started as Blue Zone, the record company put us in all these posh London studios with various producers," recalls Devaney. "We weren't particularly happy working



**READY TO GO ONLINE:** An Amek technician puts the finishing touches on the installation of Gracieland's massive 48/48 split 9098 console.

Photo by Patrick Stapley.

like that and none of the stuff that got recorded was successful. Ironically, the only record that attracted any attention to the band was recorded by us in our own little 8-track back in Rochdale for no money whatsoever."

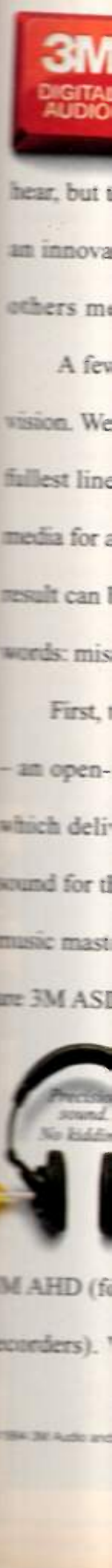
That record was a B-side that took off in the U.S. dance charts, and prompted Arista to pick up its option for a second album — which turned into the first Lisa Stansfield album and was how the Rochdale studio came about. "I think at that stage we'd pretty well decided that we didn't want to record in flashy commercial studios anymore," recalls Devaney. "So we persuaded Arista that, rather than spend money on expensive studio time, it was more productive to spend it on building our own 24-track facility. Out of this was born the Rochdale Studio, and the bizarre situation where during the day we'd be building the studio, and in the evening we'd be back at our little 8-track putting down songs."

Unknown to Arista at the time, the new studio took much longer to come

together than planned, and a lot of the first album was actually recorded on 8-track, including Lisa's first big international hit "All Around The World."

"Most of 'All Around The World,' says Devaney, "was recorded in a little shed at Lisa's mom and dad's house. We did the programming, keyboards and vocals there, and then decided we wanted to add real strings. So we took our TASCAM 8-track to 10CC's old Manchester studio, named Strawberry, transferred it to 24-track, and put the strings on. The whole lot was copied back again to 8-track, bouncing the strings down to stereo as we went. This meant that by the time we'd finished, the vocals (recorded with a Sennheiser 421 and a cheap Fostex compressor) were at least fourth generation. We mixed the track at home in the bedroom, and that was the record — it was probably the worst technical record ever made, but it kinda worked!"

A similar approach was taken on the track "You Can't Deny," which was a big hit in America. "The vocals for







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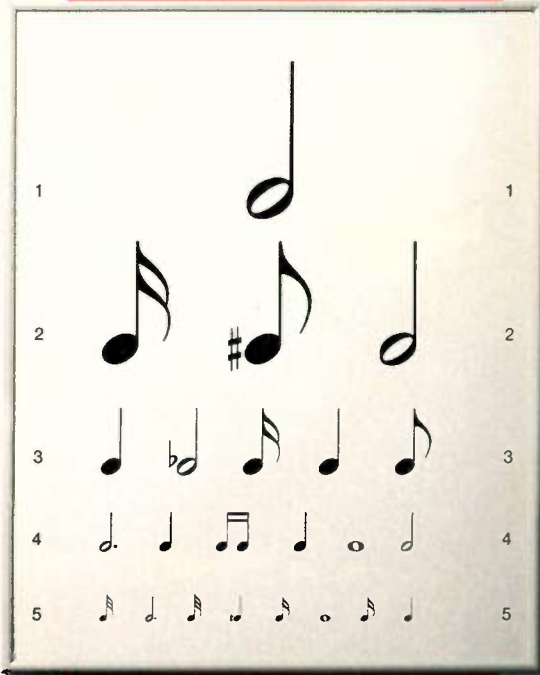
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## STATE OF GRACIE

that were recorded in our home toilet," reveals Devaney. You can actually hear this small room ambience on the voice, which most people probably assume is some sort of digital reverb, but really it was the sound of our bathroom."

### ROOM TO GROW

The Rochdale Studio was finally completed in 1989, with both Lisa and Ian finishing off much of the building work themselves. "As far as the original studio design was concerned, it was all a bit vague," admits Devaney. "We basically had this bit of land, paced it out, and got on with it. There was one decision, though, that turned out to be a very good one, and that was to make the control room quite large; apart from the fact that it's just good to work in a big room, there's no way we could have accommodated the 9098 desk later on."

The first equipment to be installed at Rochdale included a sec-

ondhand Soundtracs console bought from a studio in Iceland, and an old Soundcraft 24-track machine. Since then the studio has steadily grown and the standard of equipment improved with an Amek Mozart replacing the Soundtracs, and an Otari MTR 90 replacing the Soundcraft. The building doubled in size during the early '90s with the addition of a plush split-level lounge, which perhaps rather predictably was quickly found to have other uses, as Devaney explains.

"When the extension had just been completed we were in the process of recording 'In All The Right Places,' which we co-wrote with John Barry (James Bond scores, etc.) for the film *Indecent Proposal*. Rather than go to another studio to record strings, we decided to try out the upper level of the lounge and stuck a 12-piece section up there. It sounded fantastic, and we've now run permanent lines to it."

The most recent improvements to

the studio have included the total refurbishment of the control room, to make way for the Amek 9098, and a rebuild of the 220 sq. ft. studio area. Local Manchester company, ESS, was responsible for the extensive acoustic treatment in both areas.

"The massive size of the Amek 9098 48/48 split console (5 x 17 ft) necessitated a fairly unusual design for the control room," says ESS designer Andrew Parry. "In order to avoid a severe desk splash problem, an Early Sound Scattering room design was employed using a system of specially designed front-end diffusers. This provides much of the advantage of a reflection-free zone, with the added benefit of consistent response and imaging throughout the control room. The DynaudioAcoustics M3a monitors are effectively transformed into large planar sources by the diffusers, eliminating the fringing that usually causes midrange hot spots."

Diffusers have also been installed



Photo by Patrick Stapley.

THE HOUSE (AND STUDIO) THAT LISA BUILT: Lisa Stansfield's home has always held a studio, but the latest version, built where the tennis courts once stood, is the most sophisticated.



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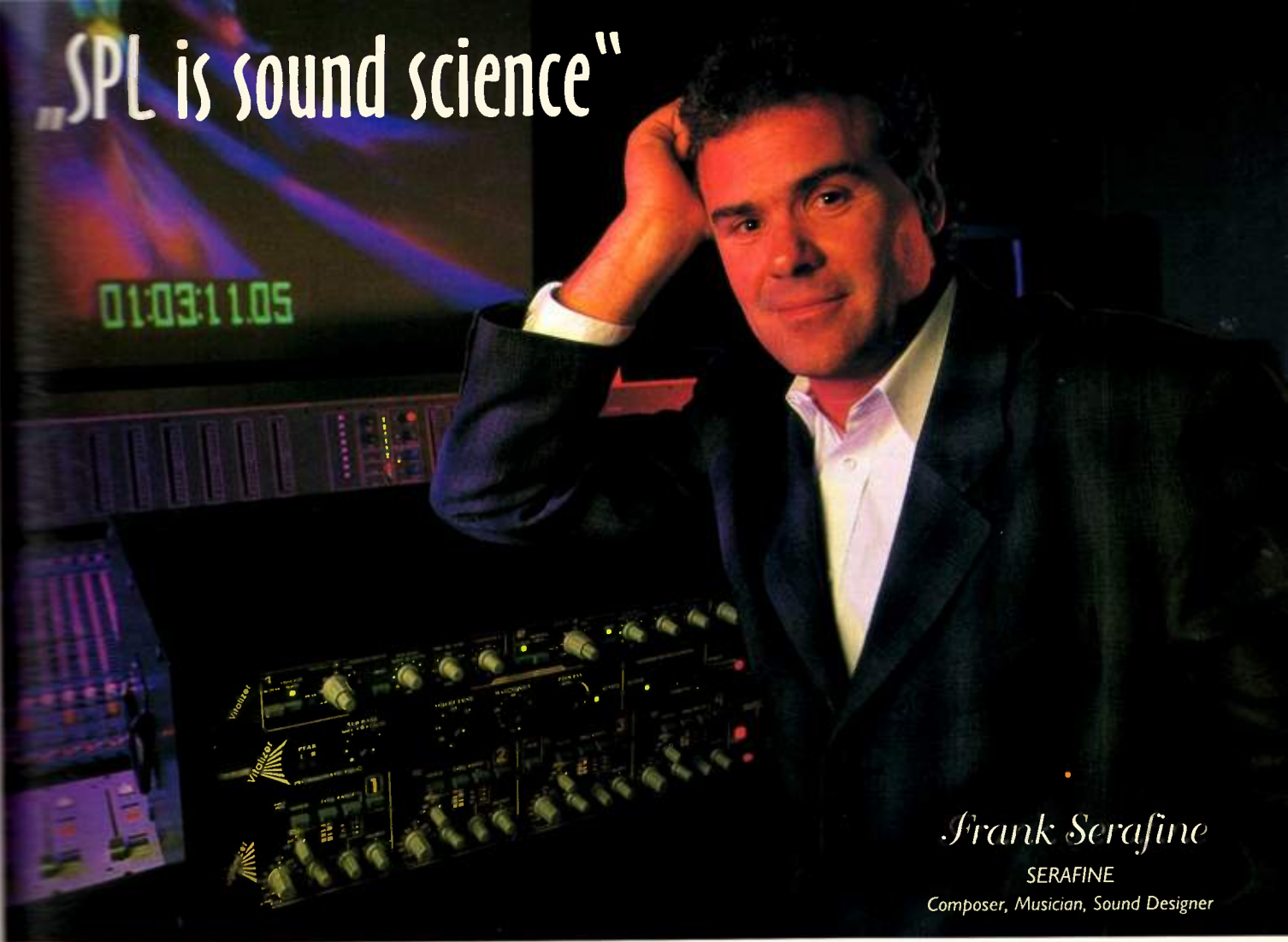
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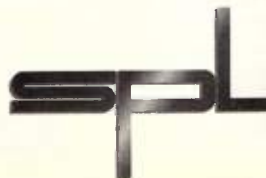
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# STATE OF GRACIE

into the front wall and ceiling area of the studio that has been divided into live and dead areas. Installation work was carried out by another local company, Boomerang Sound, who installed an extensive Krone-terminated wiring system.

## BY THE SEA

Since this recent phase of improvements began at Rochdale, Stansfield and Devaney have worked on the pre-production and programming for the next album at their Irish seaside house near Dublin. There, a basement room has been converted into a small studio (also designed by ESS) equipped with the original Amek Mozart from Rochdale, a bank of ADATs, and a large Macintosh-based MIDI setup.

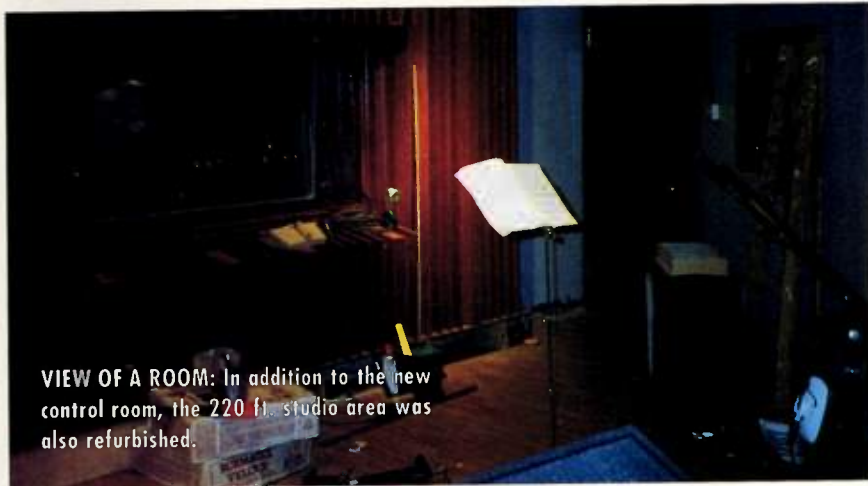
"It suits us much better than booking into a commercial studio everyday," remarked Devaney. "I suppose it harks back to the way we started out really with our 8-track setup, just being able to work in our own time without any pressure. I expect we'll continue to work this way in the future, doing the programming and

some recording over in Ireland, and the vocals, live instruments (strings, brass, percussion, drums) and mix back at Rochdale. The emphasis in Ireland is on keyboards and MIDI, whereas the Rochdale studio has a better selection of outboard gear, tape machines, and, of course, the 9098 console."

"I do as much as I can on the Macintosh. I run Steinberg/Jones's Cubase

Audio, so we do quite a lot of direct-to-disk recording — purely because of the ease and speed of editing. When we record vocals in Ireland, I use the Amek 9098 mic preamp unit plugged directly to the Macintosh via a Tube Tech compressor. I also send a preprocessed split to DAT as a backup because, as we all know, computers can crash!"

Devaney also uses Digidesign's



VIEW OF A ROOM: In addition to the new control room, the 220 ft. studio area was also refurbished.

Photo by Patrick Stapley.

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## THE EQ INTERVIEW: RUPERT NEVE

**EQ: How much of a design connection is there between your vintage Neve designs and the design of the 9098?**

*Rupert Neve: The 9098 is designed to be in the same tradition as my vintage consoles and should not be in any way confused with the consoles made by the company that presently bears my name. Those vintage consoles had a certain look and style that were dictated by my view of ergonomics, which is to say, wide modules with large knobs, easy to operate, and so forth — and the monitor section, which clearly separated the monitor facilities and functions from the input functions. Sonically,*

*the 9098 is in the same character as the original consoles.*

**Are you considering designing any other modules (perhaps a dynamic module) in the vein of the 9098 equalizer?**

I think I have quite an exciting answer on this point. You will notice that the 9098 EQ is actually entitled the "System 9098 EQ." We are creating a very interesting range of modules that can be linked together as building blocks to suit the user's needs. Let me give you an idea of what is coming.

Firstly, Amek has just completed my System 9098 RCMA or Remote Controlled Microphone Amplifier. The RCMA houses four 9098 mic amps in a rack-mount case with local or remote control of parameters through software. Multiple RCMA's can be ganged to provide a complete remote mic input system. We then intend to introduce a lower-cost mic amp module, the System 9098 microphone amplifier. This module provides the same circuitry but with manual control of the amplifiers from the front panel.

I am currently working on the design of the System 9098 compressor. This compressor will again be in the tradition of the "old" designs and I hope will be as desirable as those revered products.

Finally, we are specifying a small rack-mount mixer, currently entitled the System 9098 Mixette — or "rich man's Mackie" as Nick Franks has referred to it. Here I will provide probably eight line inputs with auxiliary sends, direct outputs, and a stereo bus with the usual fader, pan, mute, and solo facilities. It will be possible to gang a number of these little mixers together and to add Amek's automation system if required.

In conjunction with Amek I am putting into the hands of the industry the possibility of building up from these modules a genuine Rupert Neve-designed mixing system. For example, those producers who wish to take eight EQs and a mixette in a flight case with them for tracking purposes will be able to do so for a relatively modest price. On the other hand, it will also be possible to build up a reasonably sophisticated mixing console from these components that will not, of course, have the fantastic facilities of the 9098 but will deliver immaculate performance.

Photo by Patrick Stapley.

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## STATE OF GRACIE

Sample Cell, which is integral to the Mac. The Sample Cell, he says, lets him avoid the hours spent in front of an S1000 and the inevitable eye strain. MIDI'd keyboards comprise a selection of old and new synthesizers including Wave Stations, Vintage Keys, various Roland synths, and some original Moog gear. "I don't have a favorite keyboard," says Devaney, "and although there are a few sounds we tend to return to, I think the important thing is to keep a vision on the song and just use whatever fits best."

As a songwriting team, Stansfield and Devaney tend to work quite quickly, but not always totally conventionally: "On the last album, *So Natural*, Lisa got an idea for a song when she was out at the pub, but rather than lose the spontaneity, she rang the studio's answering machine and sang it down the phone. The next day I transferred it to my Macintosh and started playing around with bits she'd sung, and that formed the basis for the track 'Goodbye'."

### ONE TAKE LISA

As far as recording vocals is concerned, Stansfield is very fast, and, according to Devaney, will often put a master down in one take. "We try not to do more than three passes because after that you start losing the freshness of the performance — if it's not happening by then, we'll come back to it another time rather than doing hundreds of drop-ins and trying to patch things up."

For Lisa's vocals, Devaney uses the AMS ST 250 stereo microphone: "It just has a real clarity. It's quite sensitive and you can't abuse it like some other mics, but for Lisa's voice it's spot on and I never find myself diving for EQ because the flat sound is so good."

Backing vocals are mostly sung by Stansfield herself, although if a different sound is needed, Devaney will use

the two female vocalists he takes on tour. Other musicians also tend to be picked from the touring band, with the exception of the string players who are all selected from a local music college.

When it comes to mixing, Devaney is meticulous and spends quite a lot of time reviewing sounds.

"Because we work quite quickly in the early stages, I like to change sounds and experiment with them before we mix. Quite often I'll lay-off sounds to analog purely to take some of the digital edge off them. I always mix to analog 1/2-inch, sometimes using Dolby SR and sometimes without, depending on how it affects the sound — SR does do something to the sound and it doesn't always work best."

Although Devaney records using digital media, he admits that it is more for the convenience than the sound — at heart he's an analog man.

"I think good analog is pretty hard to beat, and that was certainly a primary reason why we chose the Rupert Neve-designed 9098. Our Mozart was already half-loaded with Rupert Neve channels so we were familiar with that sound, and when you get used to that kind of sonic quality it's very difficult to go back to using anything else. The desk features various facilities such as moving fader automation, recall, and virtual dynamics that are already proven. So, although we were taking delivery of a brand new and untried console, I was pretty confident that it would come up to expectations."

The Rochdale Studio is now fully operational once again and Devaney is currently finishing off final overdubs in preparation for mixing the new Lisa Stansfield album. A decision has also been made to open the studio commercially, although this will be very carefully controlled — "Having spent so much time and effort getting the studio to this level, we want to be pretty sure we can use it!" stated Devaney. **EQ**

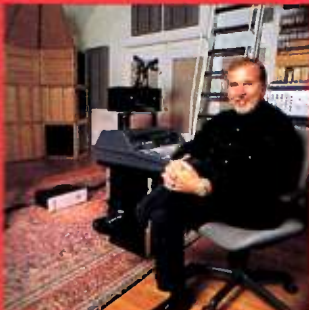
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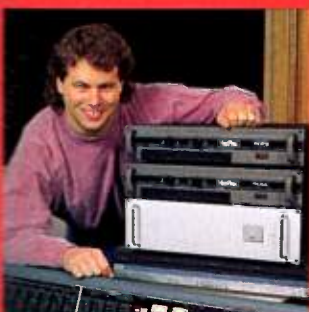
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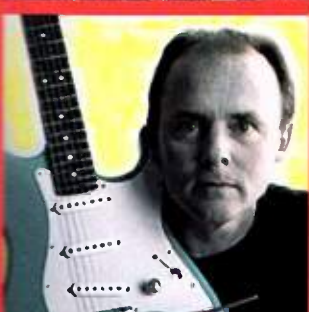
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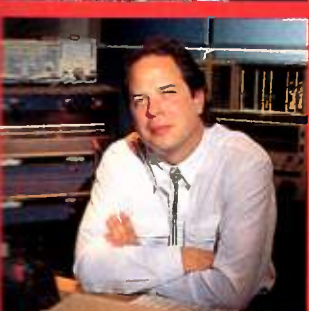
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# Steaming

Surf the bleeding edge of tube technology  
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By Eddie Ciletti and Craig Anton





# The Tube

**The vacuum tube's** resurrection from the trash heap of obsolete technology is a unique side effect of the digital revolution. Now considered the Stradivarius of amplifying technology, the tube is revered for its warmth — a quality that perpetuates myth and defies quantification. Even the most ardent proponent of solid-state has to admit that tubes have their own sound, and that sound can be very useful.

There is equilibrium in the audio biz. The fade out of our beloved analog storage media (vinyl and tape) created a sonic void. Apparently, analog's shortcomings (specifically the saturation of tape and the high-frequency limiting required to make vinyl work) are also its strong suit; saturation and soft clipping characteristics may never have ever been intentional design features, but they sure seem to be desirable artifacts among engineers and listeners alike. It's taken for granted that running a solid-state output through a tube is the fastest, simplest way to warm up a sound and "round off" some of silicon's jagged edges.

The manufacture of vintage-style gear also solves one of the problems of running a vintage-audio museum: maintenance of old tube gear. Besides, designers have learned a lot over the years about such things as grounding and low-noise design, so the latest generation of tube gear has noise specs that would have been unthinkable back in the '50s. There is one glitch, though. Manufacturers are less than likely than they were back in the '50s to include schematics (although Aphex was willing to let us know what was inside their box). Granted, there are few reverse-engineering tasks simpler than figuring out a tube preamp, but given the level of myth surrounding tubes, it's understandable that manufacturers want to add to the mystique ("our sockets use kryptonite-plated pins, resulting in a smoother, more transparent sound").

Let the tweekers have their day and debate whether stranded or solid wire gives a better sound. What we want to know is results, and that's what this roundup is all about. We've gathered together some of the hottest tube mic preamps in the biz, threw a bunch of signal sources at them, poked and prodded them on the bench, and listened real hard. Here's what we found.

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## Rolls RP-220 Dual Tube Mic Preamp

The Rolls RP-220 is a stereo vacuum tube preamp with a surprising \$499.99 list price. The unit's front panel looks particularly American with its Fender-like Volume and Gain controls and its brushed-aluminum switch caps.

I put the two-space box on the bench, popped the cover, killed the room lights, and watched those tubes do their thing. This box does exactly what it says: amplify and softly clip, if you so desire. That it does so as a mic, line, and instrument amplifier is nothing less than amazing for the price.

With the controls set at maximum, the unweighted, worst case signal-to-noise (S/N) ratio is about 75 dB. Conservative settings yielded an S/N in excess of 96 dB unweighted. ("In excess," as in, "More than this is beyond the capability of my test equipment!") The manufacturer's spec is 107 dB with no indication of how this value was achieved. It is likely "weighted," a term that means a filter network has been inserted between the Device Under Test (DUT) and the measurement device. Doing so more accurately reflects the ear's sensitivity to noise, as well as eliminating noise outside the spectrum of human hearing.

Carbon resistors are employed throughout. Changing these to the low-noise, metal-film-type did not reduce the noise level. (As the unit's components age and the warranty

expires, this may be a desirable modification.) I did notice a tubular idiosyncrasy which was resolved by carefully matching two tubes on a tester (see the "Vacuum Tube" sidebar).

The balanced output comes from a 4560 dual op amp running on  $\pm 12$  volts. Soft clipping starts above +15 dBu at the unbalanced output. (Add 6 dB for balanced operation.) Circuitry before the op amp prevents hard clipping (unless you are a lunatic). Frequency response of the instrument

1600's transformerless preamp or a Gaines MP-2 preamp (\$599). The preamp outputs fed a DAT machine. This permitted a quick visual indication of the variations in transient response — between any two preamps — via the peak meters.

Both straight time and crescendos were used to test both the low-level and the high-level performance. Playing softly yielded similar results from all three preamps. But at high signal levels, the results were both different and predictable: the transformerless preamp yielded the most transient response, the Gaines preamp (with its transformer front end) slightly softened transients, while the Rolls RP-220 was most variable; it could be both clean and pleasantly crunchy.



**MANUFACTURER:** Rolls Corporation, 5143 S. Main St., Salt Lake City, Utah 84107. Tel: 801-263-9053.

**APPLICATION:** Dual-channel microphone and instrument preamplifier.

**SUMMARY:** An affordable stereo preamp that is adaptable to almost any situation. This box gives the working musician vacuum tube technology for the price of IC op amps.

**STRENGTHS:** Can provide both clean and saturated sound on mic, instrument, and line inputs; has phantom power plus balanced and unbalanced outputs that are switchable to mic or line levels.

**WEAKNESSES:** The vacuum tubes in the review unit were not well matched; no schematic was included with the manual.

**PRICE:** \$ 499.99

**EQ FREE LIT. #:** 124

input is 21 Hz to 30 kHz,  $\pm 0/-2.5$  dB.

To test the unit, two Shure Beta 57 microphones were set up side by side as drum overheads. One mic was routed to the Rolls RP-220, while the other mic was routed to either a Soundcraft

The RP-220 softened transients while creating additional upper harmonics (a.k.a. distortion) that made the snare seem both louder and brighter in a most appealing way, without EQ. For voice, the results varied greatly; perfect



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# Spinning The Tube

for one, a bit too much midrange on another. (Proof again that there is no single solution.) My Univox P-Bass clone shook dust from the ceiling. I purposely cranked the levels, but never got those nasty sharp edges. For optimum distortion control, I recommend using one channel of the Rolls for clean preamplification and then feeding that

signal to the other channel — via compressor — for doing the nasty.

The operator's manual is brief — a device this simple requires little information — but I was troubled to find that no schematic was provided. Documentation might benefit users capable of tweaking the parameters to their needs.

The Rolls RP-220 smoothes the

rough spots and is not wimpy. Its volume and gain controls can tailor the desirable nonlinearities to taste. It will crank, crunch, or behave, but its strong suit is that there is room in the middle to experiment. Even more amazing is that, for less than the price of a transformer/IC preamp, you get a pair of "escape" valves! —Eddie Ciletti

## RSP Technologies Saturator

**B**efore the digital revolution, engineers knew that each generation away from the original recording meant the loss of some high frequencies. In addition, repeat plays of the multi-track master softened transient response. Compensation began while tracking; adding a little treble at each stage as an insurance policy that hopefully paid off at mixdown.

Not realizing how much tape saturation and vinyl's idiosyncrasies have been our safety net, we engineers of the digital revolution are being forced to kick the brightness habit or find an alternative to analog's most useful shortcomings. RSP Technologies created the Saturator for just that purpose.

The RSP Saturator is not a mic or an instrument preamp. And, unlike most distortion boxes, the Saturator does not make things brighter. It does increase the apparent loudness by lopping off transients. But the added harmonics add fullness without irritating harshness, much to the credit of RSP's creative engineering department. The



Saturator does emulate the high-frequency saturation of tape while letting much of the low-end punch through. Though better suited to individual tracks, judicious use on bright mixes can also be effective. I found it "smoothing" (soothing + smooth = smoothing) on percussion, background vocals, and synths. One note, the Saturator will yield more consistent results on mix material when placed after a limiter.

The external power supply has both input and output cables to avoid the frustration of a traditional wall wart. To the outside world, the Saturator is an active-balanced box with both XLR and 1/4-inch TRS connectors. The tubes are visible through ventilation holes in the two-space front panel. Two VU meters are provided to indicate either output level or the amount of saturation. Increased clockwise rotation of the Drive Control smoothly pol-

ishes the sound by pruning transients smoothly away. The Bypass Switch facilitates comparison. Like the Rolls mic preamp, there is a "rounding" circuit that prevents hard clipping. This is placed between the Output Level Control and the output op amp.

While the Saturator has two 12AX7 dual triodes — one for each channel — only half of each is connected. Some hacker will probably find a use for the other half, perhaps as the front-end for an instrument input or possibly as part of a prelimiter circuit. (FYI, AKG only used half of the 6072 dual triode in its C-12 microphone. The other half was used in the stereo version, the C-24.)

The manual is thorough and full of both settings suggestions and alternative applications. A frequency response chart indicates how the Saturator attenuates high-frequency response as signal level increases. This trademark feature might be put to use to protect ears and high-frequency drivers in live applications.

By far the most popular form of distortion, overdriven analog tape is the sonic tool most missed by users of digital multitracks. Audio sculptors seeking alternatives to tape saturation find that certain types of vintage gear can do a similar job. The Saturator, from RSP Technologies, is an affordable alternative to owning a recording equipment museum. It combines modern and vintage technology with electronic sleight of hand.

—Eddie Ciletti



**MANUFACTURER:** RSP Technologies, 2870 Technology Drive, Rochester Hills, Michigan 48309. Tel: 810-853-3055.

**APPLICATION:** Analog tape saturation simulator.

**SUMMARY:** The harder this device is driven, the softer transients become.

**STRENGTHS:** Well suited to tracking vocals and solo instruments on their way to digital multitracks; 1/4-inch and XLR connectors are provided for both inputs and outputs; this box works better on mix material when preceded by a limiter.

**WEAKNESSES:** This box works better when preceded by a limiter; no schematic was included with the manual.

**PRICE:** \$699

**EQ FREE LIT. #:** 125



# Aphex Model 107 Mic Preamp



Without the vacuum tube, the Aphex Tubessence Model 107 would be a great archetype for the default microphone preamp found in an average mixer. Constructed from high-quality components, its powerful, low-impedance, discrete output amplifier might also be standard fare at the major outputs of mixers, signal processors, and capturing devices. Its complementary pair of PNP and NPN output transistors make the Aphex 107 quite capable of driving either a 600-ohm load or a really long piece of wire.

The Aphex Tubessence is not a conventional vacuum tube preamp. First, it is a transformerless device, utilizing a transistor array front end (the Analog Devices SSM 2210P) followed by an op amp. The input pad and phase-reverse features bypass audio through gold-plated sealed relays rather than a silver-plated switch. (Silver switches should not be used for audio signals because they oxidize. These switches route DC only.) In addition, there's a jack on the rear panel that allows remote muting control via footswitch. (Despite the colorful account in the manual about the Grateful Dead's need for such a feature, I find it surprising that a front-panel switch was not provided.)

The external power supply, a traditional PITB (pain-in-the-butt) wall

wart, steps the hot sauce down to 24-volt AC. Inside, a switching power supply creates 48 volts for both phantom and tube plates, 12 volts for the tube filament and  $\pm 16$  volts for the op amps. Unlike the RSP or the Rolls, only the tube softens clipping, the output is not balanced and it doesn't take up two rack spaces.

It was a fortuitous coincidence when that creative client called for an equipment recommendation just as I happened to be well stocked with gear for evaluation. Guitarist-producer Jon Gordon (of Jon Gordon Productions, NYC) helped out with the Aphex 107 Tubessence review by providing some hands-on comments on in-studio use. In his productions tests, the Aphex Tubessence was used along with a Gaines Audio Model MP-2 (a transformer-balanced dual mic pre), using two microphones: a Neumann TLM 193 and an AKG C 414 B-ULS. The preamp signal was routed through a Summit TLA-100A compressor and recorded directly to DAT.

Guest reviewer Jon Gordon: For my first test, I used my own rather deep voice as a test subject with the results favoring the Gaines preamp, which sounded tighter and more detailed than the Aphex. The Aphex proved itself, however, with a female singer whom I had found difficult to record in the past. In the lower register, her voice is soft and breathy — a



**MANUFACTURER:** Aphex Systems, LTD., 11068 Randall Street, Sun Valley, CA 91352. Tel: 818-767-2929.

**APPLICATION:** Dual-channel microphone preamplifier.

**SUMMARY:** Dual-transistor/IC input circuitry with the tube driving the discrete transistor output amplifier. High-quality, low-noise components used throughout.

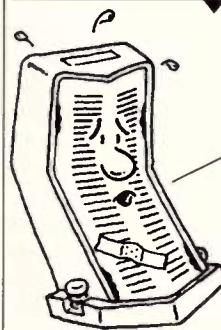
**STRENGTHS:** Small package; innovative circuitry; high-pass filter; foot pedal mute jack.

**WEAKNESSES:** XLR input connectors are located on the front panel.

**PRICE:** \$595

**EQ FREE LIT. #: 126**

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quality that tends to disappear in a mix. However, there is a sharp delineation as her voice passes into the more powerful upper register. Close-miking, for an intentional proximity effect, was impractical due to the frequent and uncontrolled vocal peaks in her voice.

I chose the TLM 193 microphone and set the compressor for a fast attack and fairly heavy gain reduction. The compressor was fed directly to a TASCAM ATR 60-16 analog 16-track recorder, using Ampex 456 tape at 15 ips, with dbx type I noise reduction. I alternately used the Aphex and the Gaines preamps, changing nothing else in the setup.

Though initially, there did not seem to be quite enough high-end detail, the Aphex was pleasingly warm with a lower midrange emphasis that permitted repositioning of the mic to a slightly higher and more distant location. This helped to further reduce the proximity effect and produced a more balanced tone. The Aphex Tubessence provided a much-needed sense of physical presence to the singer's lower register. The Gaines sounded distant and clinical by comparison.

The Aphex 107 sounds very good. It has a comprehensive set of features with a characteristic sound that complements my existing equipment. The Rolloff switch is a particularly useful feature, especially with a no-frills mic like the Neumann TLM 193. One discrepancy concerns the filter's rolloff frequency. Though stated as 60 Hz on the panel (a silk-screening error), the manual sometimes refers to it as an 80 Hz switch. (E.C.'s tests confirm it is 80 Hz.) I generally preferred the sound of the unit without the rolloff. The filter did, however, effectively eliminate the thump of popping "P's." —*Jon Gordon*

Thanks Jon. Onward: The manual is

## USING THE APHEX 107 BY KEVIN LEONARD

My first experience with the Aphex Model 107 Tubessence microphone preamp was on a session where I was miking drums. When my Neve 31105 mic pre didn't sound so great on a snare drum, I tried the Model 107. With a Shure SM57 plugged directly into the Tubessence and then straight to tape, the sound was phenomenal. It sounded as good as my vintage mic preamps, which cost up to six times as much. With my Neve module I had to boost around 8 or 10 kHz to open up the top end, but the Aphex unit had that sound without having to add EQ — which brought back the transient response and got rid of the phase distortion.

After that first session I started trying the Aphex unit on different instruments. I have found it great for tracking male rock vocals with an Electro-Voice RE27 N/D. I plug the mic into the 107, then into a (Teletronix) LA2 or a DeMaria Labs ADL1000 and go straight to tape. On female vocals I like to use an AKG C12 into the Tubessence then to a tube compressor (or sometimes an Aphex Expressor) and then straight to tape. I have never had to use the pad on the preamp when tracking vocals. From the project studio point of view, having the inputs on the front panel is an advantage since a lot of vocals are cut in the control room anyway.

The Aphex Tubessence also sounds good with a dynamic mic (like a Shure SM57) on loud rock guitar amps, particularly Marshalls. The upper midrange and the high frequencies get re-created properly, and it's a case where output resembles input — something that engineers strive for. I did need to use the pad for this situation, but I found that the pad did not add any noise or color to the sound. In general, the unit translates the sound of the mic without changing it. Ambient information is preserved because the bandwidth of the 107 is so wide (probably in part because there is no transformer on the input). When you walk from the studio into the control room you are hearing the same sound. I have also had good results recording guitar and bass through Countryman (FET) and DeMaria Labs (tube) direct boxes with the 107. I can go from the instrument to the DI, then to the 107 and straight to the tape machine with no EQ, and still get a great sound.

*Kevin Leonard is an engineer at Whitney Houston's BKB Studio in Elmwood Park, New Jersey. Kevin has been using the Aphex Model 107 Tubessence microphone preamplifier for the past four months.*

thorough and well written and gives a helpful account of the basics without being excessively pedantic. It is clearly aimed at psyching up project recordists who are buying their first outboard preamp. The XLR inputs, located on the front panel, might have been either better replaced by or supplemented with connectors on the rear panel. Instrument inputs are more appropriate on a front panel than mic inputs that are likely to be permanently installed. The unbalanced

outputs are 1/4-inch, TRS connectors. It would be helpful to have XLR connectors as well, though there is clearly no room in the single-rack-space package.

When your budget allows for only one of everything the choice must be carefully made. Cutting tracks with quality tools facilitates the mixing process. If your in-board preamp seems cold and your digital environment is stark and lonely, add some color with the Aphex 107. —*Eddie Ciletti with Jon Gordon*

## WHAT ABOUT OTHER SIGNAL SOURCES?

While many people think of tube preamps as vocal processors, there are other useful applications. A slightly overloaded tube combines elements of compression and limiting thanks to "soft" clipping. Although this induces some distortion, a small amount of distortion can actually enhance a sound (consider those who hit analog tape hard to take advantage of tape saturation). However, distortion can also turn on you if you're not careful. A rule of thumb: monophonic signal sources (voice, bass, guitar leads, sax, etc.) can "push" the tube harder than polyphonic signals and still sound good. Distortion will be much more obvious — and generally more unpleasant — on piano, acoustic guitar, etc.

Drums are a special case, since their peaks can be pretty heavily soft-clipped without being perceived as distorted. This can produce a very dramatic effect. The increase in punch and presence is unmistakable, yet the sound does not seem distorted. Even if the levels are set so the tube operates mostly in its linear (nondistorted) region, there is still a difference compared to solid-state amplification, although it's more subtle. —*C.A.*

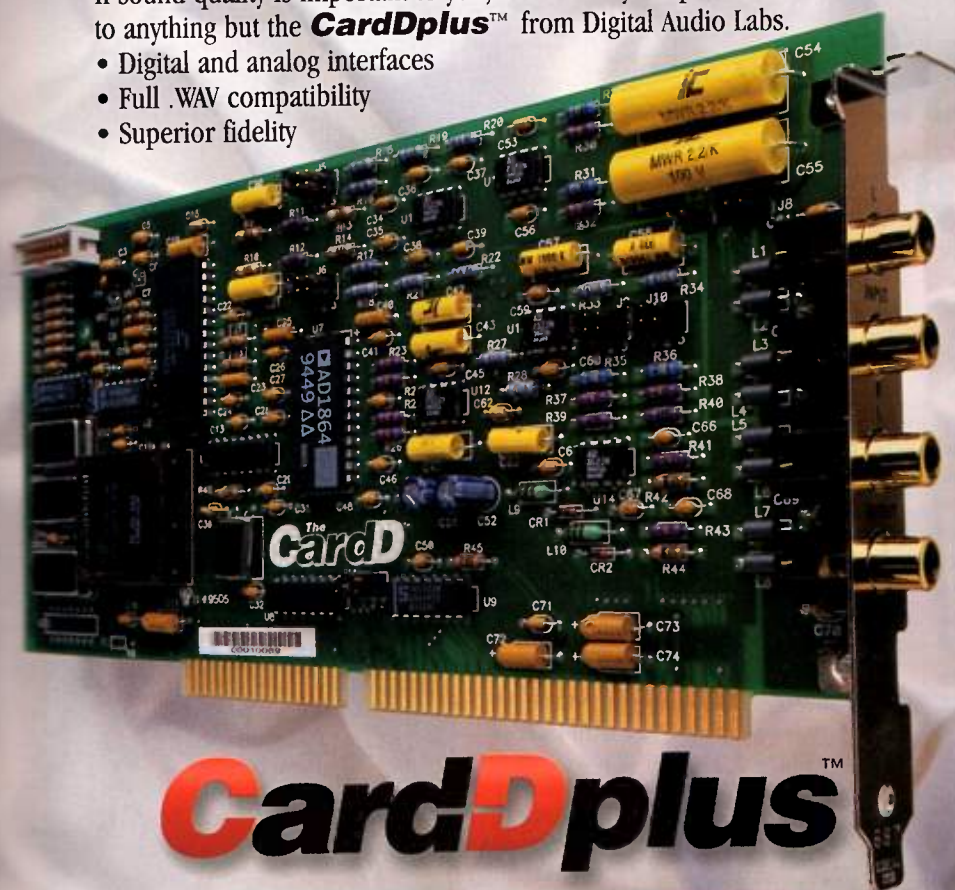


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## Giltronics 356AT Mic Preamp

This one's quite different from the average bear. It's actually a four-section device, with two mic preamps and two line amps (one of each for each channel) in one 2U package. Each section has its own level control (four total) and balanced input and output XLR connectors; a front-panel switch selects between separate mic/line preamps, or "linked" (the mic pre feeds the line amp directly, bypassing the mic and line in transformers in the process). Because of the separate input and output connectors, you can also insert signal processors between the mic preamp and line amp. In fact, if you patch the mic preamp out to the line in and take the output from the line amp out, you insert some extra transformers in the signal path that can process the sound even further.

Other controls and switches for the mic preamp section are:

- Sensitivity switch (decreases sensitivity by 6 dB)
- -20 dB Pad switch
- Phase switch
- Phantom Power switch for each channel

An IEC-standard removable line cord plugs into the rear-panel AC plug, and there's a front-panel On/Off switch. Eight Reichenbach transformers are used for the four inputs and outputs.

Six 12AT7 tubes provide six gain stages per channel. The separate/linked mic/line structure means you can pretty much stage the gain however you want (up to 65 dB of gain), which helps minimize noise beyond the unit's already low noise figure. It also makes it easy to dial in particular overload effects.

Sonically, the 356AT fits a variety of signal sources. One limitation: you can't really use it as a direct box with bass or guitar — not just because all the connectors are XLR, but because the line amp impedance is only about 15k. While optimum for outputs of electronic devices such as synthesizers, tape decks, etc., this value dulls the sound of nonactive pickups. The workaround is to use a matching transformer and feed into the mic input.

Mechanically, the unit is sturdy

### MICS AND PREAMPS: SEPARATED AT BIRTH

Choosing the right microphone and preamp combination is no small task. How well a microphone performs varies with both the application and the environment. Selection and placement, of course, is the great mystery that is solved only with continued experimentation. Surely a well-placed mic in front of a virtuoso can't be beat. But in a disorganized track, even a great performance can get lost. Fortunately, the electron goddess hath provided us with faders, EQ, compressors, and effects devices that can make even the spoken word sound like thunder. But what difference can a mic preamp make?

Preamps are put to the test when cranked to amplify a pianissimo or when some inebriated fool starts hollerin', "Iz this thang on?" In between, the differences are far more subtle. There can be no amplification without noise. Low-noise, metal-film resistors guarantee long-term peace and quiet. Hand-selected active devices (tubes, transistors, or integrated circuits) improve the odds. Input transformers are passive, yet they can provide 15 dB of noiseless gain. Transformerless preamps must use great components. If not, they're just cheaper boxes to build.

Finally, outboard preamps are a better bet than the average in-board preamp because of the following:

- 1) The components are generally of a higher quality.
- 2) The printed circuit board layout and wiring can be optimized for the most direct path with minimal interconnects.

3) Improved shielding and ground plane minimizes the potential for power, RF, or TV interference.

Of course, sound is important, too. I couldn't tell a sculptor which rocks to choose, but I do know there are some great rocks out there! —E.C.



**MANUFACTURER:** Giltronics, Inc., #220 Nalomeli, Kapaa, HI 96746.  
Tel: 800-682-2778.

**APPLICATIONS:** Two-channel mic preamp for studios.

**SUMMARY:** It's expensive, but novel, and does things other mic preamps don't do.

**STRENGTHS:** Flexible audio architecture; excellent overall sound quality and overload characteristics; quality parts used throughout.

**WEAKNESSES:** Expensive; no overload indicator; no phone jack inputs/outputs; not intended for bass or guitar DI.

**PRICE:** \$3295 (special limited-time pricing for EQ readers: 20% off, or \$2636)

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# Shedding The Tube

and uses premium parts — including gold-plated switch contacts and low-noise conductive plastic pots — although one of the mic/pre controls was loose on arrival. And speaking of controls, why not calibrate the knobs for those who want to write down settings?

These complaints aside, the sonic quality is impeccable. It did wonders for voice, electronic drums, synthesizers — anything thrown at it. Overall,

the sound has a “transparent” character, with very smooth tube compression. Overdrive is pretty smooth, and remains there unless you go for really outrageous amounts, at which point tube breakup occurs.

Giltronics is a small company, which tends to lead to higher prices, but also implies finding a niche not satisfied by mainstream products. The 356AT does not disappoint; being able to access

the four stages individually opens up a lot of options not present in other devices. Besides, there’s no denying that it sounds really good.

Bottom line: although you don’t have to spend anywhere near this much money to get a good tube sound, no mic preamp duplicates the particular architecture the 356AT offers. Those with deep pockets will find this a useful tool with much potential. —Craig Anderton

## Peavey VMP 2 Mic Preamp

The first thing you notice is the look: pure ‘50s retro, down to the pointer knobs, oversized switches, battleship gray paint, and pilot light. Inside the 2U rack package are three 12AX7’s and one 12AT7 output stage for each of the two channels.

Figuring out the VMP 2 is simple. Each channel includes:

- Front-panel 1/4-inch phone line input for DI applications (200k input impedance)
- Rear-panel balanced XLR input, 1/4-inch unbalanced out, and balanced XLR out.
- Gain control (goes up to 11; all knobs are calibrated)
- Bass and treble controls (x10 dB at 100 Hz and 10 kHz, respectively)
- Switches for: 20 dB input pad in/out; phantom power on/off; EQ in/out; and low-frequency cut (80 Hz, 40 Hz, or off; 12 dB/octave).

There’s also a front-panel power switch and rear-panel (captive) AC cord and fuse.

In A-B comparisons with solid-

state preamps, it was a no-brainer to pick out the VMP 2’s unmistakably “warm” tube sound. Specifically, the differences are a rounder low end, a smooth (as opposed to sharp) kind of detail in the high end, and a warmer midrange. These characteristics are similar to other high-quality studio-oriented tube preamps.

As a DI box, the high-input impedance lets you plug in guitar and bass without worrying about loading down the pickups. That does not mean the VMP 2 is a distortion box for guitar; it’s more of a “fattener” that can give a more “chunky” sound. It’s easy to get a gentle overload, and you can push pretty hard and still have acceptable sound quality. However, like most

tube gear, there is a point where the sound breaks down and turns into ugly distortion.

The manual is minimalist at best — a single page, repeated in four languages. Here’s the summary: turn up the gain until you get the sound you want, but back off if there’s excess distortion.

The VMP2 has a few surprises. With more people feeling that extended high-frequency response does make a difference, it’s worth noting that the response is down only -3 dB at 40 kHz and flat to 10 Hz. Also, the output voltage is a hefty +20 dBm max. And the EQ sound is very pleasing; while basic, it does what you want it to do, and is a welcome bonus generally not found in tube preamps.

Peavey takes an unabashedly retro, minimalist approach but backs it up with technology (particularly, low noise) that meets today’s sonic requirements. If you want that “creamy” kind of all-tube sound, don’t want unneeded complications, and want excellent value for money, this box performs precisely as advertised. —Craig Anderton

*There is an AIFF file on America Online (keyword SSS, then click on “EQ Online”) of a drum sound straight, then pushing the Peavey VMP 2.*



**MANUFACTURER:** Peavey Electronics, 711 A Street, Meridian, MS 39301. Tel: 601-483-5365.

**APPLICATIONS:** Two-channel mic preamp for project and commercial studios.

**SUMMARY:** A retro, minimalist box with a classic tube sound.

**STRENGTHS:** Built like a tank; “creamy” audio quality for both the preamp and EQ; good for DI applications.

**WEAKNESSES:** No clipping indicator; no master volume, only preamp gain.

**PRICE:** \$949.99

**EQ FREE LIT. #:** 128



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## Groove Tubes MP1 Mic Preamp



**T**he MP1 is a half-rack mic preamp with a twist: it's also marketed as a DI box for bass, synth, drum machines, etc. This is reflected in the front-panel DI unbalanced input jack and DI/mic switch.

Other controls and jacks are:

- XLR mic input with switchable +48V phantom power, XLR output jack
- -0/20 dB switchable pad
- Phase switch
- Low-frequency rolloff in/out (for reducing p-popping and such)
- Tricolor LED level indicator (an analog meter is available as an option)

The MP1 includes no power supply; you need to get one of Groove Tubes' models (PS-1, PS-2, or PS-4, which can power different numbers of units). The MP1 was tested with the PS-1, the most basic supply. Power goes to the unit through a standard, 9-pin D connector cord (which you can pick up at Radio Shack — a decided advantage over proprietary cables).

Regarding specs, the DI input is a respectable 200k — enough to minimize loading on pickups. The maximum output is hefty (+21 dBu) and frequency response is virtually flat to 20 kHz.

Describing sound is always tough, but the MP1 has the "characteristic" tube fatness, yet is extremely quiet. One difference is that the high end seems more "aggressive" than other units, rather than being "mellow." This can increase the articulation of instruments going through the preamp, as well as make murky voices more distinct. If you want a mellower sound, no big deal; just pull back on the highs somewhere else in the signal chain.

The MP1 handles "soft" distortion well, but, as expected, beyond a certain point the distortion turns extremely

ugly. Pay attention to the overload LED; as long as you don't go past the yellow into the red, you're cool. And since the MP1 is touted for DI applications, I whipped out my bass and checked it out. It sounded great; when compared to a solid-state DI, the natural compression that tubes provide when driven hard gives a much more in-your-face sound.

The manual is four pages, with reasonably complete specs and a wiring diagram for the power supply cable. There's also some useful advice about changing tubes.

Since you have half a rack left over, you might want to add either another MP1 for a stereo setup, or the Groove Tubes EQ1, a five-band graphic EQ with three switchable center frequencies per band. While reviewing the EQ1 is beyond the scope of this article, it complements the MP1 very well and is a useful signal processor in its own right whose sonic character recalls vintage Pultec equalizers. It's easy to picture two EQ1's in a rack for stereo program material processing.

Overall, the MP1 seems to be positioning itself as the box to use when you don't want to use the mic preamps in your board, or want to go direct into your recorder's input. The lack of noise and faithfulness of reproduction make the MP1 a natural workhorse for studio applications.

—Craig Anderton



**MANUFACTURER:** Groove Tubes, 12866 Foothill Blvd., Sylmar, CA 91342. Tel: 818-361-4500.

**APPLICATIONS:** Mic preamp and DI for project and commercial studios.

**SUMMARY:** The MP1's definition and gentle distortion work well on a variety of sounds, not just voice.

**STRENGTHS:** Very "defined" audio quality; useful overload indicator; works well for DI.

**WEAKNESSES:** External power supply is inconvenient (but cost-effective if you need to power multiple units); no master volume, only preamp gain.

**PRICE:** MP1 Mic Preamp, \$725; PS-1 Power Supply, \$260; EQ1 5-Band EQ, \$595  
**EQ FREE LIT. #:** 129

### WHERE'S THE BYPASS SWITCH AND MASTER VOLUME?

Today's mic preamps can do a lot more than just amplify a mic. Many of them make great direct boxes for bass, and can warm up the sound of a digital synth. They're also nice to run through when mixing to DAT if you want a warmer, fatter sound. In all these applications, you're often running with a tiny bit of distortion, and you need a master volume to trim back to unity gain — as well as a bypass switch to do A/B comparisons so you don't get too carried away with the "tube sound."

It seems every mic preamp has a slightly different sound, and choosing the right one for vocals often depends more on the singer and mic being used than any technological bells and whistles. When comparing multiple preamps, it's easiest to run them all in series and bypass all but the one being auditioned. This is faster and easier than repatching, and we'd sure be willing to see the list price of the fairly expensive units go up another \$20 or so for the privilege of having a bypass switch.

—C.A.



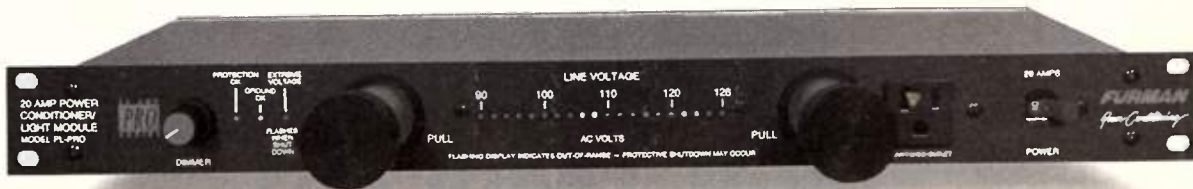
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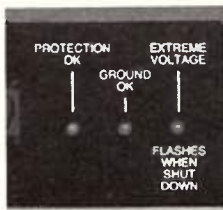


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# The Tube



## D.W. Fearn VT-1 Tube Mic Preamp

One rarely encounters a modern electronic product that embodies vacuum tube amplification as well as the D.W. Fearn VT-1 microphone preamplifier. It truly reflects an era long past — when products were made one at a time by their designer. There are no semiconductors in the VT-1's audio path. The sound is completely derived from the two 12AY7 dual triodes and two Jensen transformers (one for input; the other for output). Its beautiful, maroon front panel spans three rack spaces and is made from a robust, quarter-inch slab of aluminum.

At the beginning of the operator's manual, Mr. Fearn explains that the inspiration for the VT-1 came after listening to tapes recorded in 1968 at his first, home-brew studio. His "mixer"

was created from six, '40s-era RCA tube preamps found in the junk room of an old radio station. There was no EQ and no pan pots, only left-center-right switches and rotary faders.

From my storefront in New York's East Village, I strung cables to the nearby First Street Cafe to record an avant-garde jazz trio. The group, Out of Order, consists of electric cello, traps, and a multitaled fellow who plays alto sax, flute, and trumpet.

Since I had but a single channel of VT-1, the opposite channel alternated between the Aphex Tubessence and the Rolls RP-220. The preamps were fed directly to a Fostex D-10 DAT recorder. The two AKG CK91 microphones (cardioid capsules on SE300B bodies) were placed about five feet in front of the cellist (situated between the other two



**MANUFACTURER:** D. W. Fearn, PO Box 57, Popcopson, PA 19366.  
Tel: 610-793-2526.

**APPLICATION:** Single-channel microphone preamplifier.

**SUMMARY:** A quintessential vacuum-tube device with no semiconductors in the signal path.

**STRENGTHS:** Phantom power; gold-plated connectors; analog VU meter; the input attenuator switch includes a 20 dB pad with a low-Z input setting to match microphone impedances below the typical 150 ohms.

**WEAKNESSES:** No instrument input.

**PRICE:** \$2000

**EQ FREE LIT. #: 130**



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# no feedback\*

places these extremely narrow filters only as deep as they need to be to eliminate feedback. These precisely placed FBX filters remove the feedback without damaging your sound.

## big sound — little package

We're using the latest advances in digital circuitry to make the FBX-SOLO very small. Six of them fit side-by-side in our single-space rack tray. Vocalists can carry one in their gig bag for personal feedback control at every performance. You can have more freedom than ever with your wireless microphone knowing the SOLO is taking care of feedback. Acoustic guitarists thrive on all that extra gain and clarity from such a small package. And the SOLO makes monitor engineers heroes, because they can patch a SOLO on every offending channel. Your monitors will **finally be loud enough**, and your mix will sound clearer, too, because those narrow FBX filters surgically remove the feedback without ruining your sound. And, by the way, the SOLO does it all automatically.

The SOLO comes in two versions: the **SOLO SL-610** for line level insert points on your mixer's inputs, and the **SOLO SM-610**, with mic level input (XLR & 1/4"), line level output for use with mixers that don't have insert points. The SM-610 includes a microphone pre-amp and phantom power. Both units are ruggedly built and fully digital.



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\*Feedback automatically detected and eliminated in 0.4 seconds, typical @ 1 KHz

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# Gleaning The Tube

instruments). Both mics were pointed straight ahead and spaced about three inches apart. A personally hand-crafted monitor box facilitated the task of separately auditioning each channel. The output was routed to both channels of an amplifier and monitored on both headphones or speakers.

During quiet passages, the first obvious difference among the three preamps was the Fearn's ability to capture the rumble of trucks as they

barreled down Houston Street. More subtle was the wide-open space around the cello's lower extremities. Neither of the other two preamps tickled my rumble bone as much, but the subtleties became more obvious as the trio's dynamics shifted toward forte.

Channels were balanced during mezzo (moderate) passages, but percussive drum hits revealed the nuances of each device's transient capabilities. Peaks that nearly became "overs" on

one channel of the DAT's peak meters were 3 dB to 8 dB lower on the opposite channel. I repeatedly listened to each channel to compare the sound of the hits. Those differences were clearly audible, never bad, and subject to the taste of the listener and the appropriateness of the material.

On the bench, the Fearn VT-1 had the most headroom of the three preamps I tested. Asymmetrical clipping on the lower half of the waveform starts at +23 dBu. The upper half of the wave begins to soften beyond +25 dBu. The exact opposite occurs when the VT-1 is terminated with a 600-ohm resistor. The positive peak starts flattening out at +10 dBm, while the negative excursion gets pretty round by +15 dBm. The worst case signal-to-noise (S/N) ratio is 85 dB at maximum gain (more than 10 dB better than published). At minimum gain, the S/N is well in excess of 100 dB.

To reduce headroom and enjoy more of the tube's nonlinear qualities requires either lowering the input at the DAT, overdriving the input stage by not using the pad, or terminating the output with various resistors. (A switch disables the beautiful analog meter if you wish to overdrive the preamp without damaging the movement.)

It is interesting to note that, when driving a 600-ohm load, the VT-1 behaves much like the older, Class A Neve modules. Both react like limiters to short bursts of signal by letting most of the peaks through, then gradually settling into the old soft clip. Incidentally, the most symmetrical softening occurred when a 6 kohm terminating resistor was used.

D.W. Fearn provides a 5-year limited warranty and will provide two, selected 12AY7's for the preamp and less critical output stages for \$50. This is a good deal considering that the alternative is to buy several tubes in order to select a chosen few.

If you are wondering how to justify the \$2000 price, keep in mind that this unit is extremely robust and is made from the highest quality components, including fine metal work inside and out. The audio circuitry is wired point-to-point (just like in ye olde days) and the power supply is semiconductor regulated. This pure vacuum tube product is your time machine to the past. Like our memories, the Fearn VT-1 is better than being there. —Eddie Ciletti

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## WHAT YOU SHOULD KNOW ABOUT VACUUM TUBES

Like records, vacuum tubes have that major tangibility factor. Warm to both the ear and the touch, their guts are clearly visible through the glass envelope. Even an inexperienced experimenter can do almost nothing to destroy them; breakage being the primary vulnerability. Prices can vary considerably and a premium will be paid for hand-selected gems.

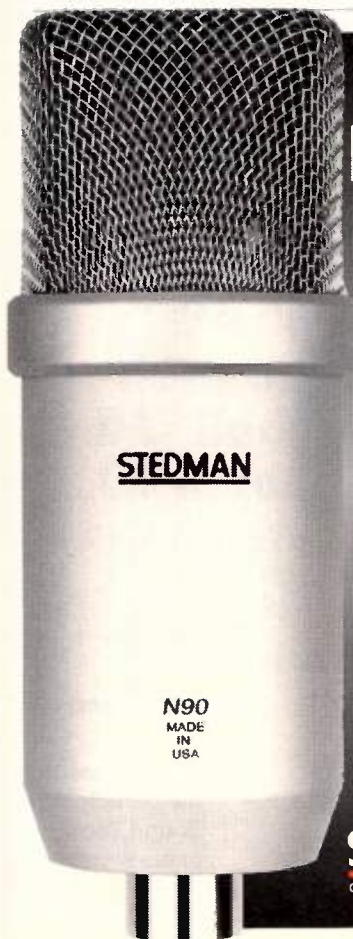
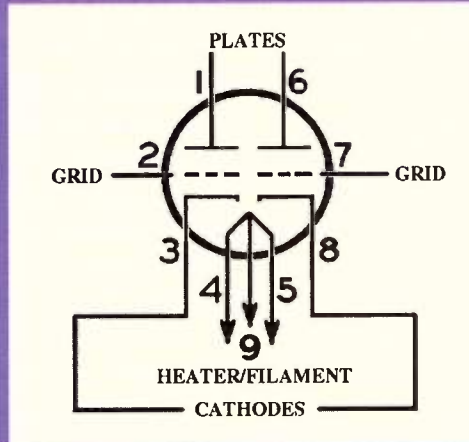
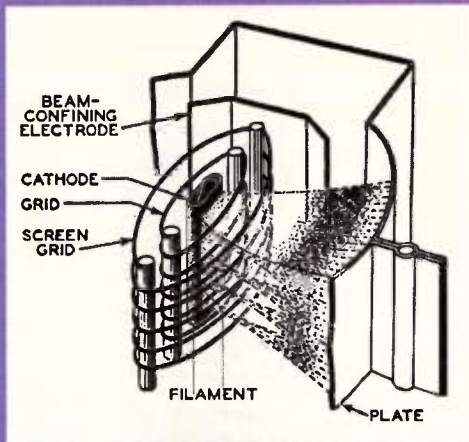
Users unfamiliar with the idiosyncrasies of the valve should note that, though warm and cuddly, they are not always consistent out-of-the-box. I am a self-confessed symmetry freak and prefer matched channels. Others might totally groove on the differences. If so, keep track of those oddball tubes and plug 'em in as needed. All personal hang-ups aside, critical dual-channel applications do require either matched pairs or enough test equipment to verify performance.

In addition to the potential for poor noise performance, tubes can also be microphonic. The best designed circuitry is that which has each tube operating well below its design maximum values. Such a comfortable margin minimizes stress and therefore extends life. (Oscilloscopes and other test gear are the best examples.) Unfortunately, our favorite sonic pals tend to live on the edge, thus making the performance of each component — tubes, resistors, capacitors, etc.— critical.

If you are into circuit tweaks, I highly recommend replacing carbon resistors with low-noise metal-film types. Available from Digi-Key (800-344-4539) and Mouser (800-346-6873), metal-film resistors have 1 percent or 2 percent tolerances, unlike their carbon brothers which are 5 percent at best and 20 percent at worst. For vacuum tubes and related parts, check out Antique Electric Supply (602-820-5411) and New Sensor Corporation (800-633-5477).

FIGURE 1 (LEFT): An exploded view of a power pentode.

FIGURE 2 (RIGHT): The "schematic" for the 12AU7, 12AT7, 12AX7, and 12AZ7. A dual-triode, it houses two independent amplifiers.



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Eddie Ciletti. *EQ Feb '95*

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Paul Tingen. *User review for Audio Media Dec '94*

"Soundscape does offer everything that you could want from a professional quality hard disk recording system ... it is cheaper, more powerful and more stable than many similar systems. But most of all it is so easy to use, allowing you to concentrate on the music."

Philip Moore. *Australian Digital Mar '95*

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Nic Blinston. *Business Video Mar '95*

"Soundscape could well find it's way replacing the analog tape recorder up and down the country ... a welcome addition to any studio set up for the sheer freedom it offers when it comes to laying tracks down quickly and easily in order to make the most of that creative muse."

Bob Walder. *Music Technology Jul '93*

"I've been playing around with Soundscape's hard disk recorder this week and feel almost as though I've had a religious experience."

Brian Heywood. *MIDI Monitor Issue 11*

"I wanted to really check out the vari sync mode. I slowed the video down to a crawl, Cubase locked in and the sequenced music was playing slowly ... a bit faster ... and ... yes the Soundscape synced up and was recording. The SSHDR1 has lots of features, creative usage of available power, sounds great, syncs great, straightforward, easy to use and expandable."

John Zulaikha. *Connections Feb '95*

## "The next stage of the Digital Revolution starts here."

Bob Walder. *Home and Studio Recording Jul '93*

## Need we say more...

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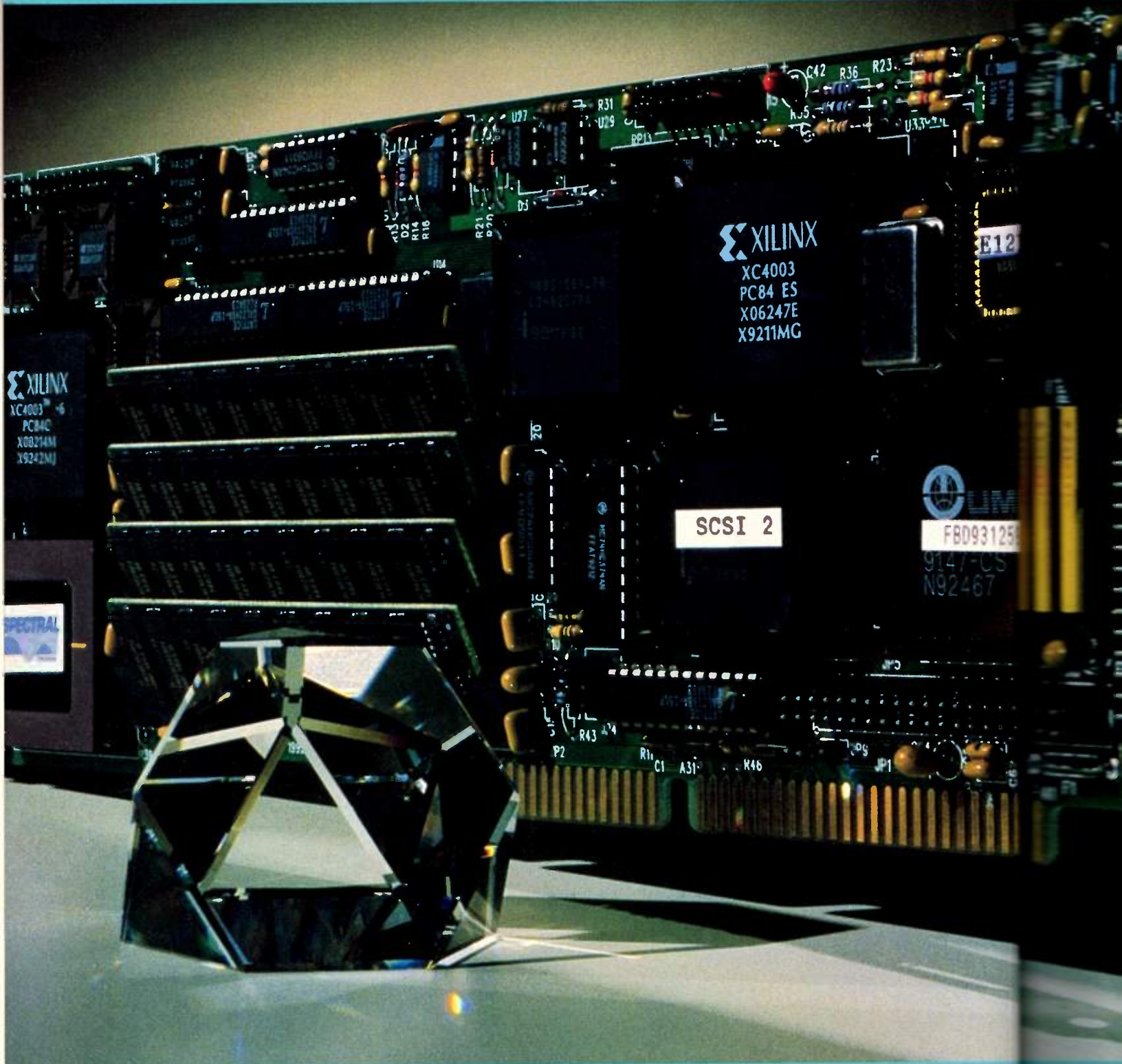
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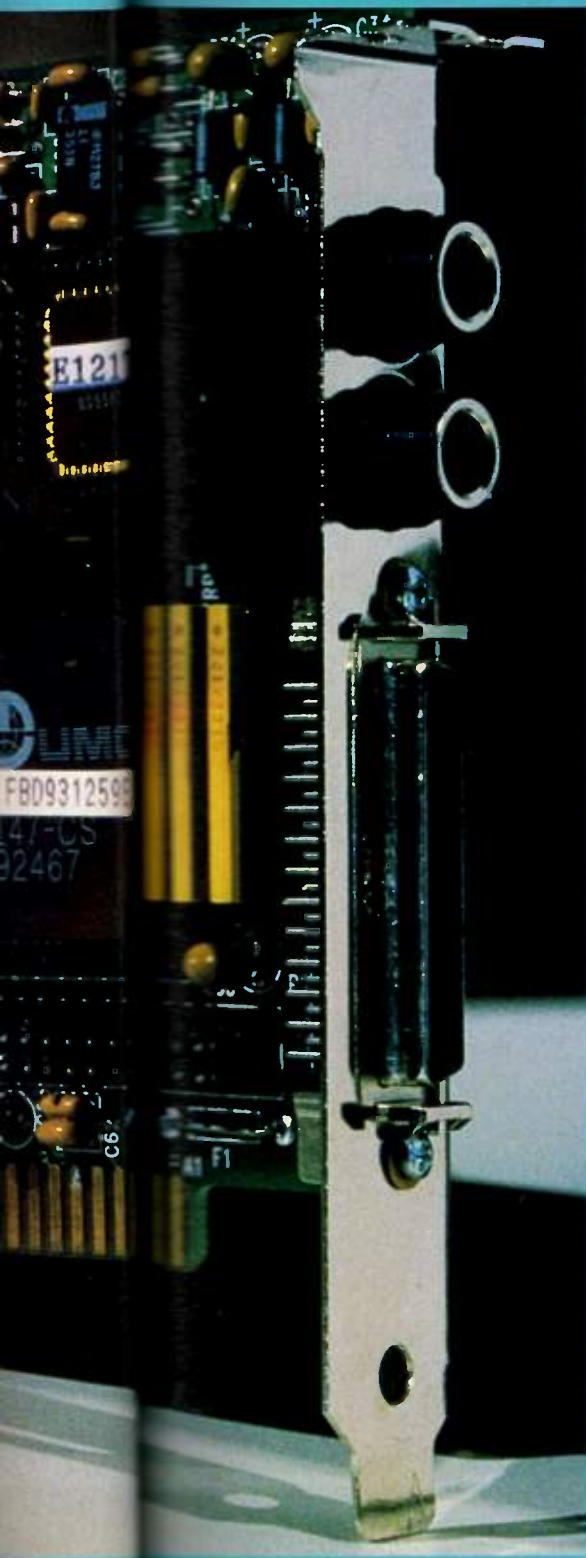
# THE SPECTRAL RIS



# THE EQ REVIEW



# **RISMAMUSIC DAW**



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**BY ROGER NICHOLS**



SPECTRAL, INC. Remember that name. They build 8-track and 16-track digital audio workstations (DAWs). Spectral is going to be the company to deal with in the DAW market. (It seems like there are 500 different companies producing DAWs these days, and, with time, there will probably be more added to the list.)

### HARDWARE

The Spectral system is PC based. You will need, at the very least, a PC-compatible computer in the 386/25 range. A PC in the 486/66 neighborhood would be better. Slower computers will make screen redraws painfully slow. You will need a separate SCSI hard disk for audio storage. A 17-inch, or larger, monitor will also help, as you'll find a lot of information on the screen. Except for the display information and input from the user, all of the audio functions are performed on the AudioPrisma™ board. AudioPrisma has its own connection for SCSI hard disk drives. Since the audio is stored on a separate drive from the one containing all of your DOS and Windows programs, there is less likelihood of a PC crash destroying your audio files. By the same token, if you forget to punch out of record on the audio drive, there is no way that audio can overwrite valuable data on the internal DOS drive. Because the drives are dedicated to the audio board, you can get more audio tracks on and off the drive at the same time than you could from the PC hard disk.

The SCSI-drive network will support additional drives for increased recording time, as well as optical, 4mm DataDAT, and EXABYTE drives. While the tape drives are used for backups of audio files, the optical drive can be used as either a backup drive or as an audio recording drive. Because of the slower speed of the optical drives, the number of tracks that can be played or recorded at the same time is limited. Four tracks is about all you could hope to accomplish with current optical-drive technology, although new faster drives are just around the corner.

The AudioPrisma board can be

connected via supplied cables to the 2- or 8-channel interface. The interface provides the connections for analog, digital I/O. SMPTE (LTC, VITC) or MTC, along with composite video or black burst, are brought in via the optional AuxBox, and all can be used for fully time-base resolved synchronization. Available for AudioPrisma, or as a stand-alone converter, is the Translator, a digital interface to transfer eight channels at a time from ADAT, Yamaha, or TASCAM 8-track machines.

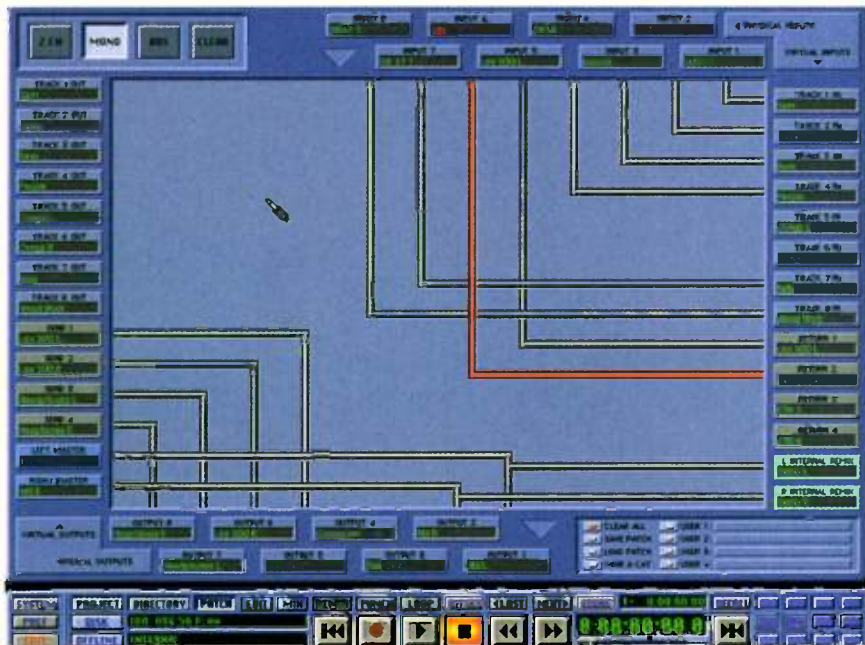
### SOFTWARE

There are two completely different user interfaces for the AudioPrisma, and both ship with every system. The original general-purpose interface is Prisma

matica, which will handle almost any editing job. Prisma Music is a different user interface that is designed specifically for the music-production environment. Both programs use Spectral's Audio Operating System (AOS), which controls the hardware, turning your PC into a multitrack digital recorder and editor. Both support virtual tracking, but Prisma Music emphasizes block editing while Prisma Music emphasizes waveform cut-and-paste editing using multiple layers per track.

With hard disk recording systems, you have to be able to keep track of all of the pieces of audio stored on the hard disk. You may have a piece of audio that is referenced in many different places in a song or video. Different sections of the audio file may be played back during each of these events. Somehow you have to keep track of all the pieces so you can make sense of the whole project.

Spectral uses Recording Bins, Segments, Insets, and Events to keep track of the audio files on the hard disk. Bins are areas where the audio is stored on the hard disk. Segments are the actual audio files that are named by the user. Segments would have names like "Auto Crash" or "Hit Song #72." Each Segment has a Start Inset and End Inset. These points are referenced to the beginning of the recording. Since these Insets are just pointers, they can overlap other Segments or be anyplace you want without affecting the actual audio. An Event



GET CONNECTED: The Prisma Music routing patchbay screen.



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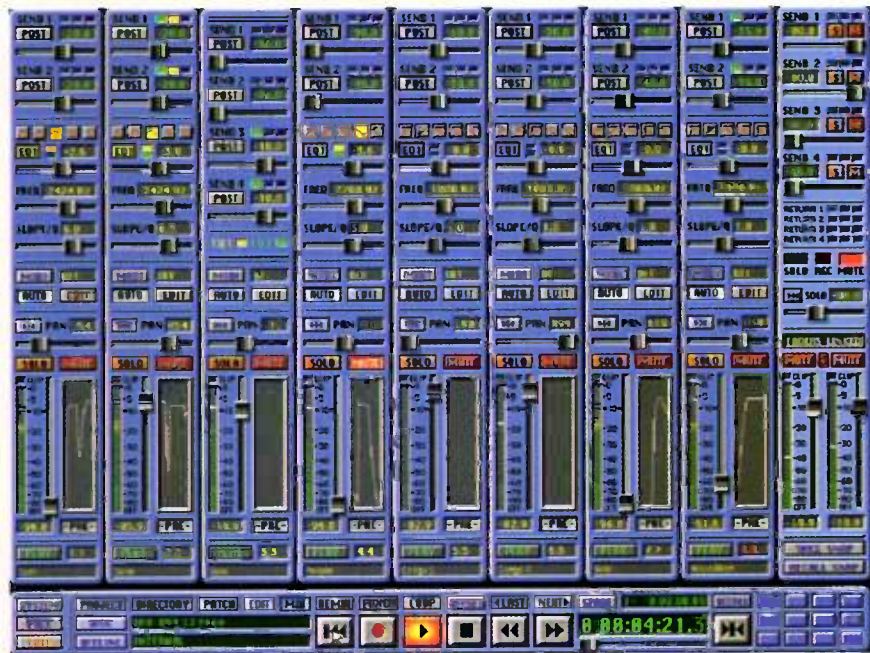
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## THE EQ REVIEW: PRISMA MUSIC



**VIRTUAL CONSOLE:** The Prisma Music mixer section.

is a command for Prisma Music to play back a certain portion of a Segment. It can be all of a Segment or a portion of a Segment. A single Segment can be referenced many times by many Events. That pretty much takes care of that.

### FEATURE PRESENTATION

In order to give you an overall view of the Prismatic package, some of the features I feel are important are summed up here.

- Punch in/ Punch out crossfade times are adjustable. This will allow you to perform punches that couldn't be done without this feature.

- Lock New Segments protects segments from accidentally being moved. This is something that I do about seven times a day. "Oops" is becoming a common part of my vocabulary.

- Destructive/ Nondestructive Edit Confirmation warns you if the edit you are about to perform will change the audio file so that it can't be undone.

- Multilevel Undo allows you to perform as many as ten edits and then undo all of them. In a powerful system that is easy to use, this is a big bonus.

- Auto Save lets you set how often your work is automatically saved. I can't remember how many times I have edited something and then become distracted by another task. I would then come back to the editor and quit without saving my work. Hey, I am allowed to make mistakes...I have been doing

this for a long time and have built up lots of "Get Out Of Jail Free" cards.

- Assign Hot Keys lets you set your own keyboard commands to perform editing operations. This helps a lot if you are moving back and forth between a couple of different editors.

- Set Tracks Stereo or Mono allows you to lock tracks as stereo pairs. If you are recording lots of stereo information, such as finished mixes, then it may make sense to be in Stereo mode. If you are editing a stereo track, both halves will automatically have identical edits.

- Lock/Unlock allows you to lock events on a case-by-case basis. If you grab the wrong event and try to move it, Prismatic will ask you nicely if you want to unlock it.

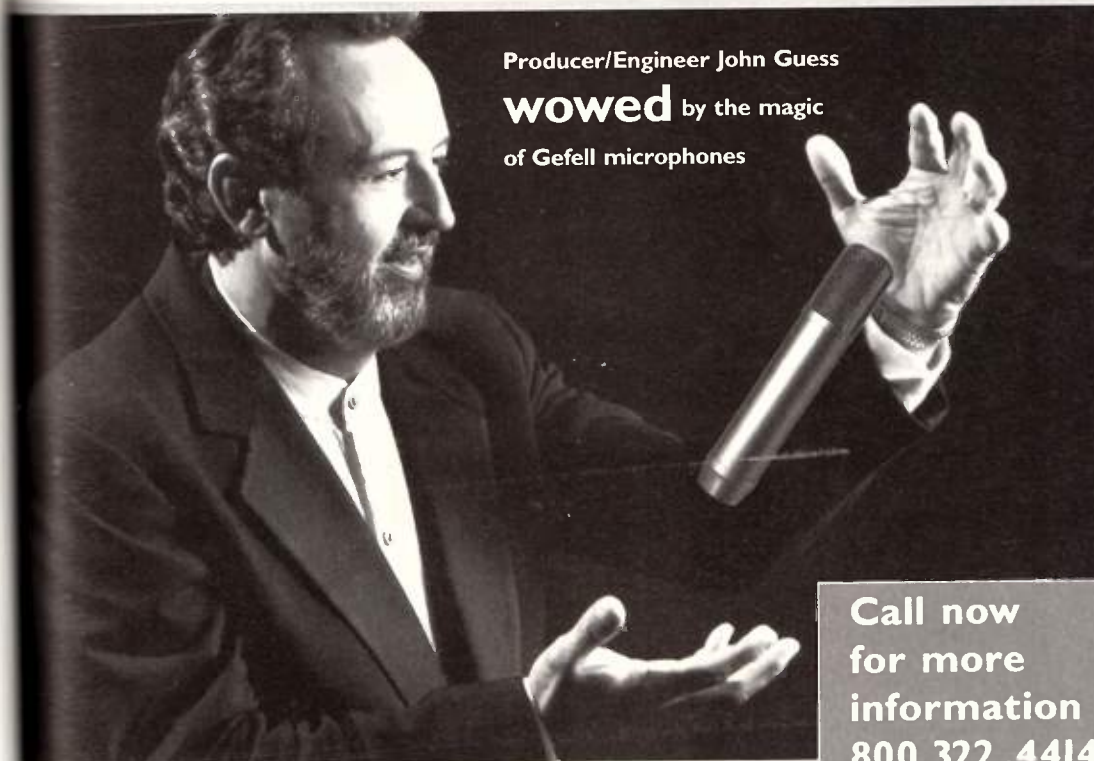
- Edit Volume is a tool that lets you set the volume of each event separately. This is different from the automation levels in the mixer section. This makes it easy, for instance, to match up levels from different vocal tracks.

- Sync Marks are part of every edit. By default, they are the same as the start mark of an event. You are able to move the mark to any position in the event. When you line up an event with a Marker, you can have it snap to the Start of the Event, the End of the Event, or the Sync Mark.

- Drag tools let you easily drag the Start, End, Sync Mark, Fade-in, and Fade-out of events to get exactly the effect you want.



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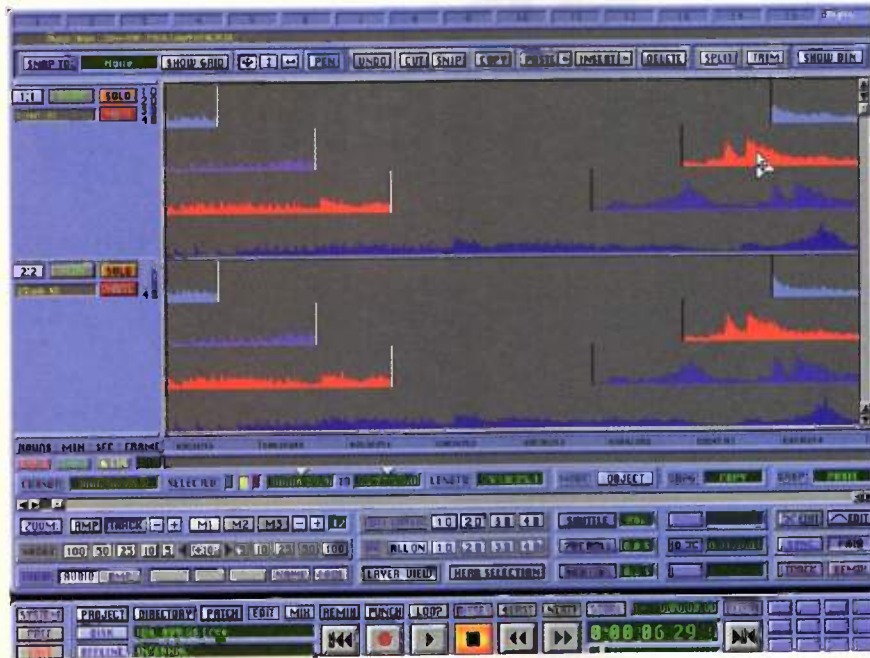
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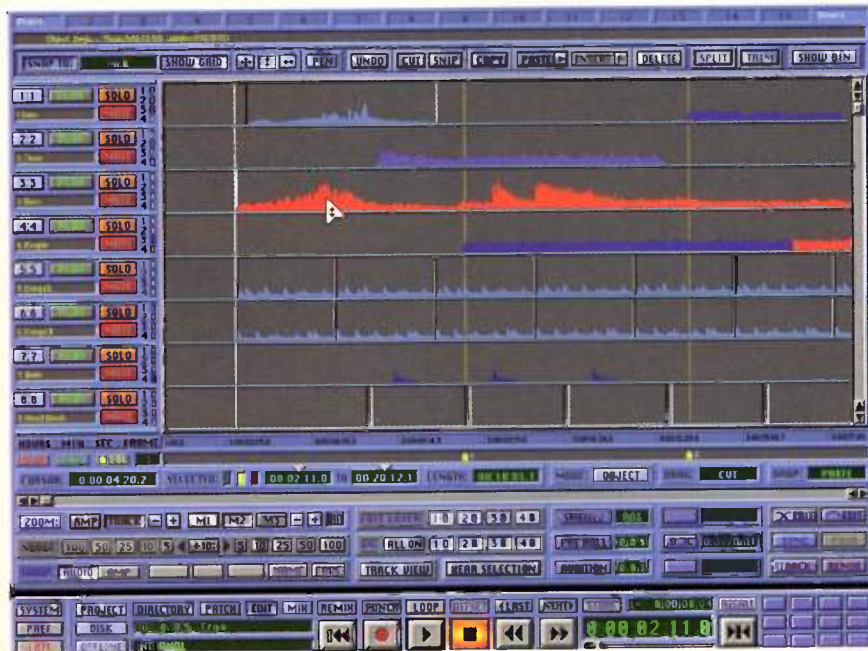
# THE EQ REVIEW: PRISMA MUSIC



**LAY UP:** With Prisma Music you can have up to four layers in a single track.

- Track/Time restrictions let you decide whether you just want to move events between tracks, move them in time, or both. If you have something just where you want it in time, but want to move it to another track, just restrict the time movement and you are assured that the event will happen exactly where you want it to.
- Scrub and Move lets you scrub audio to find the location you want, and when you let go of the mouse, the audio moves exactly the distance that you have scrubbed.

- Duplicate and Move lets you move an event between tracks and in time, but places a copy without moving the original.
- Built-in DSP tools that allow you to destructively change gain, produce fade ins and fade outs, normalize the level of any selected audio, and reverse, which flips an audio event around to play backwards. Two DSP operations — Pitch Change and Time Compression/Expansion — actually make a new audio segment that can be placed in



**CUT AND PASTE RECORDING:** Precise editing can be done with the Prisma Music edit screen.

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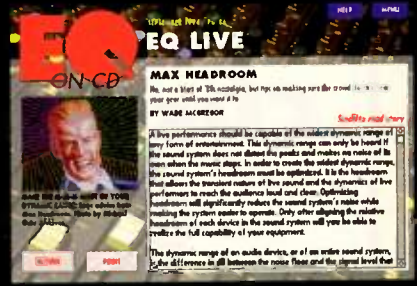
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## THE EQ REVIEW: PRISMA MUSIC

the same place as the old event without destroying the original audio.

- Remove DC Offset is a DSP function that will remove any DC in an audio file. DC can come from many sources and will cause an audible click at the beginning and end of audio events. I have run across a lot of tapes with DC on them. There are very few machines that will get rid of DC.

- Sample-Rate conversion is a necessity if you are dealing with some audio at 44.1 kHz while other sources

are at 48 kHz. Whoever thought of this should be taken out and shot.

- A multitrack mixing environment with automation and two parametric EQs on every channel.

- A Routing Patchbay screen lets you map tracks to the automated mixer and to the physical I/O of the AudioPrisma board. You can use some of the physical I/Os for effect sends and returns.

- Network connections between workstations allow you to grab an

audio event that is located on a central server or another Spectral system in the other room. You don't have to keep duplicate audio files of things that get used in every room. Cool.

- I almost forgot: 96 virtual tracks of audio, 12 of which can be played back or recorded at any one time.

### LAYER PLAYER

Prisma Music has some additional features that are pretty neat. One of them is Layering. You can have up to four layers in a single track. When you edit out a section of one layer, the layer under it shows through. Whatever is showing is what plays back in that track. This works great for combining vocal passes or guitar solos. Just place them in different layers of the same track. If you have the primary track on top and find a section that you don't like, just edit it out. The piece of vocal track in the layer underneath shows through, replacing the event you don't want. If the second layer is no good, cut it out and use the one under that.

I used the layer mode to fix a live piano track on the Steely Dan *Alive* album that I am presently working on. The piano part contained sections throughout the song that needed to be very precise. Those one-bar sections were played by a machine, but we wanted the rest of the performance to be the live piano. The machine piano was placed over the live piano. I edited out the spaces between the machine-played parts and the live piano showed through. I synced it back up to the 48-track and I was done.

It is hard to do justice to a system as powerful as the AudioPrisma seems to be. One of the most impressive aspects of Spectral is that they hired someone who works with hard disk systems every day to help them design the user front end. Steve St. Croix knows what he is doing, and all things equal, I would pick the system that he designed. When I was looking at Prisma Music, it was still in beta. Spectral provided me updates about twice a month. By the time you read this, Prisma Music will be shipping, and both interfaces will be included with every new AudioPrisma system.

For more details, contact Spectral, Inc., 18800 142nd Avenue NE, Woodinville, WA 98072. Tel: 206-487-2931. Circle EQ free lit. #131, or use the fax back system at 206-402-1400 ext. 777.

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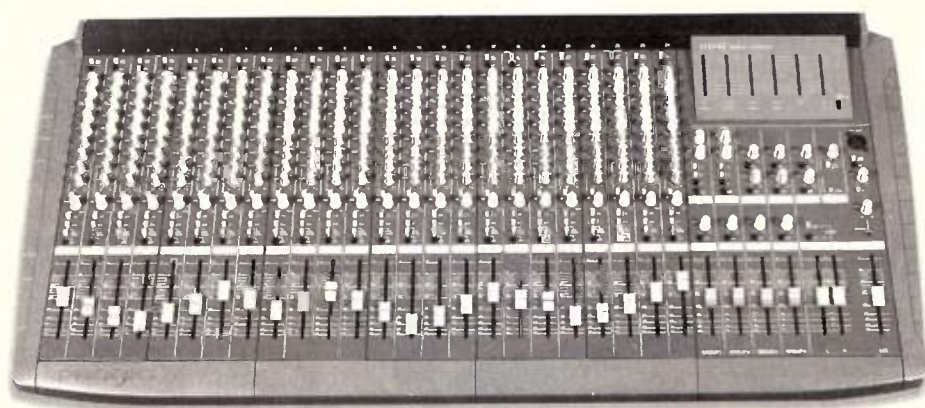
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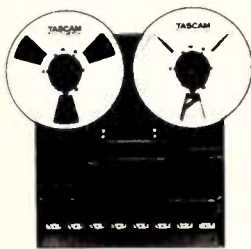
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## SAMM SOFTWARE

continued from page 32

SAMM the most powerful method of controlling the ProMix 01. The company is encouraging feedback and "wish lists" from engineers who are using SAMM, and since the company envisions rapid developments in the programming technology, it is offering unlimited updates (via BBS) to users for a nominal one-time fee.

SAMM operates on any IBM-compatible computer running Windows 3.1, Windows For WorkGroups 3.11, Windows 95, or Windows NT. Hardware requirements are a 386 processor, hard drive, 8 MB RAM (minimum), and a Windows-compatible MIDI interface card. The video display must have a minimum resolution of 800 x 600 at 256 colors.

*For more information, contact at Innovative Quality Software, 2955 East Russel Road, Las Vegas, NV 89120-2428. Tel: 702-435-9077. Circle EQ free lit. #132.*

## ARCHIVING PROBS

continued from page 54

the introduction of the 16-bit PCM-1610 format.

Sony has discontinued the 3402 reel-to-reel 1/4-inch digital machine. Sony is trying to replace the 1630 videotape-based format with the PCM 9000 optical disc format.

F-1 format machines (and all other EIAJ 14-bit and 16-bit processors) disappeared with the introduction of the DAT machine somewhere around 1987. The Beta video format used to store the digital audio information has also been discontinued for almost ten years.

The Akai 12-track digital was discontinued shortly after the ADAT format was introduced.

The Soundstream 8-track digital system was the first multitrack digital format based on an instrumentation recorder. A lot of classical recordings were done on this format. The company no longer exists, there are no machines in active use, and there is now only one machine that is equipped to make digital transfers.

All right, that's enough on digital tape's problems. Come back next issue and I'll tell you what you *should* archive your tape to.

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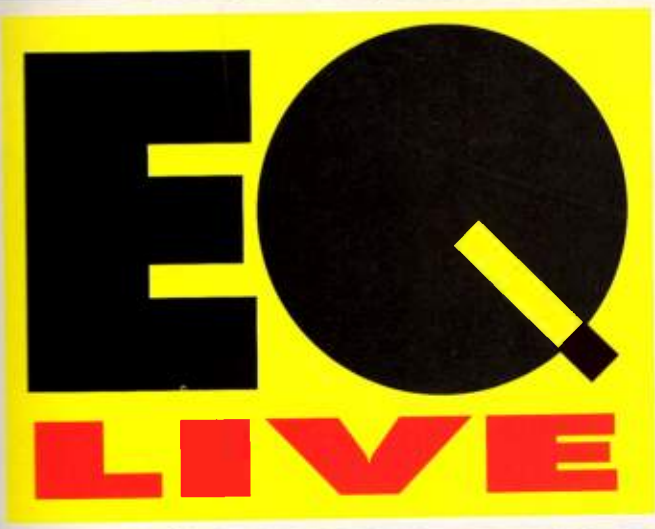
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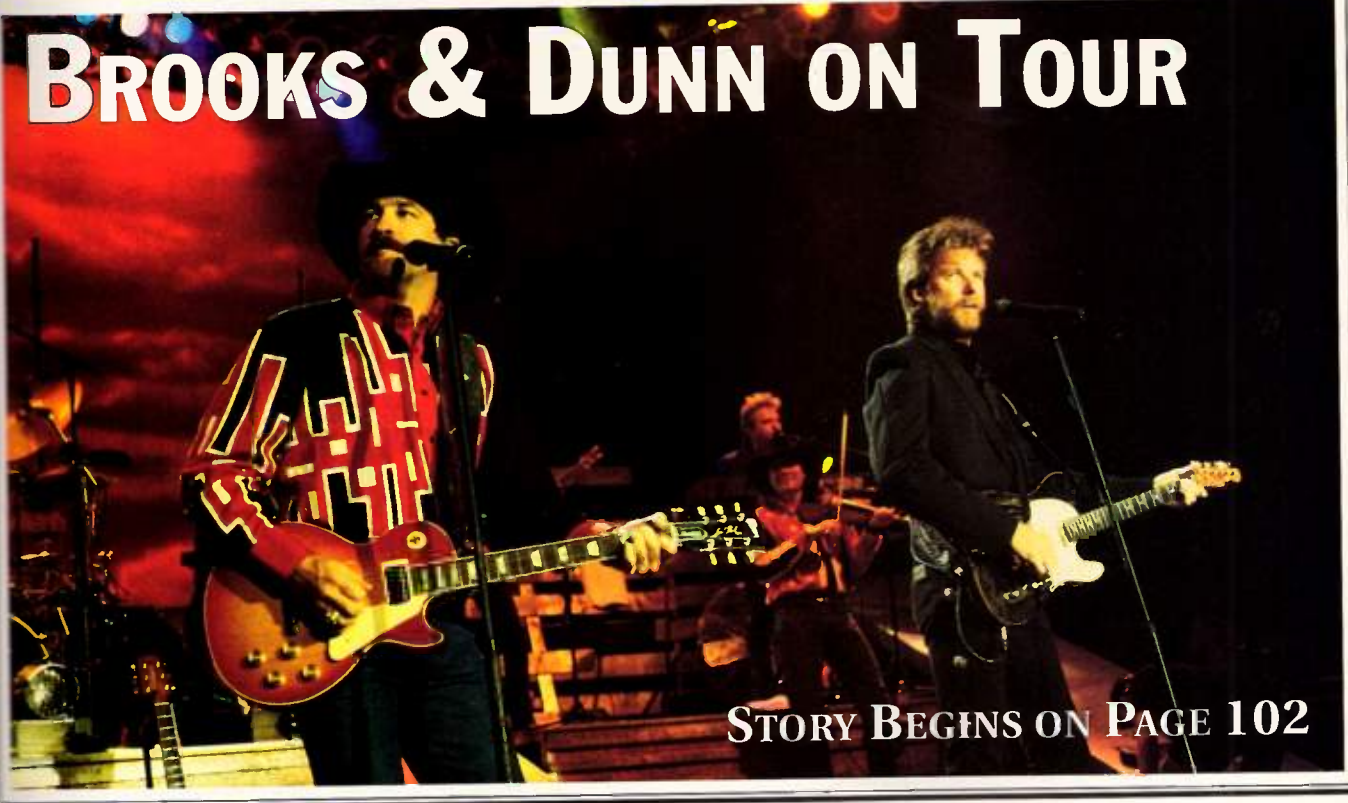
# Stewart ELECTRONICS





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PAGE 114

# BROOKS & DUNN ON TOUR



STORY BEGINS ON PAGE 102

Brooks & Dunn photos by Tom Marshall/AM

...what Sound Barrier? \*

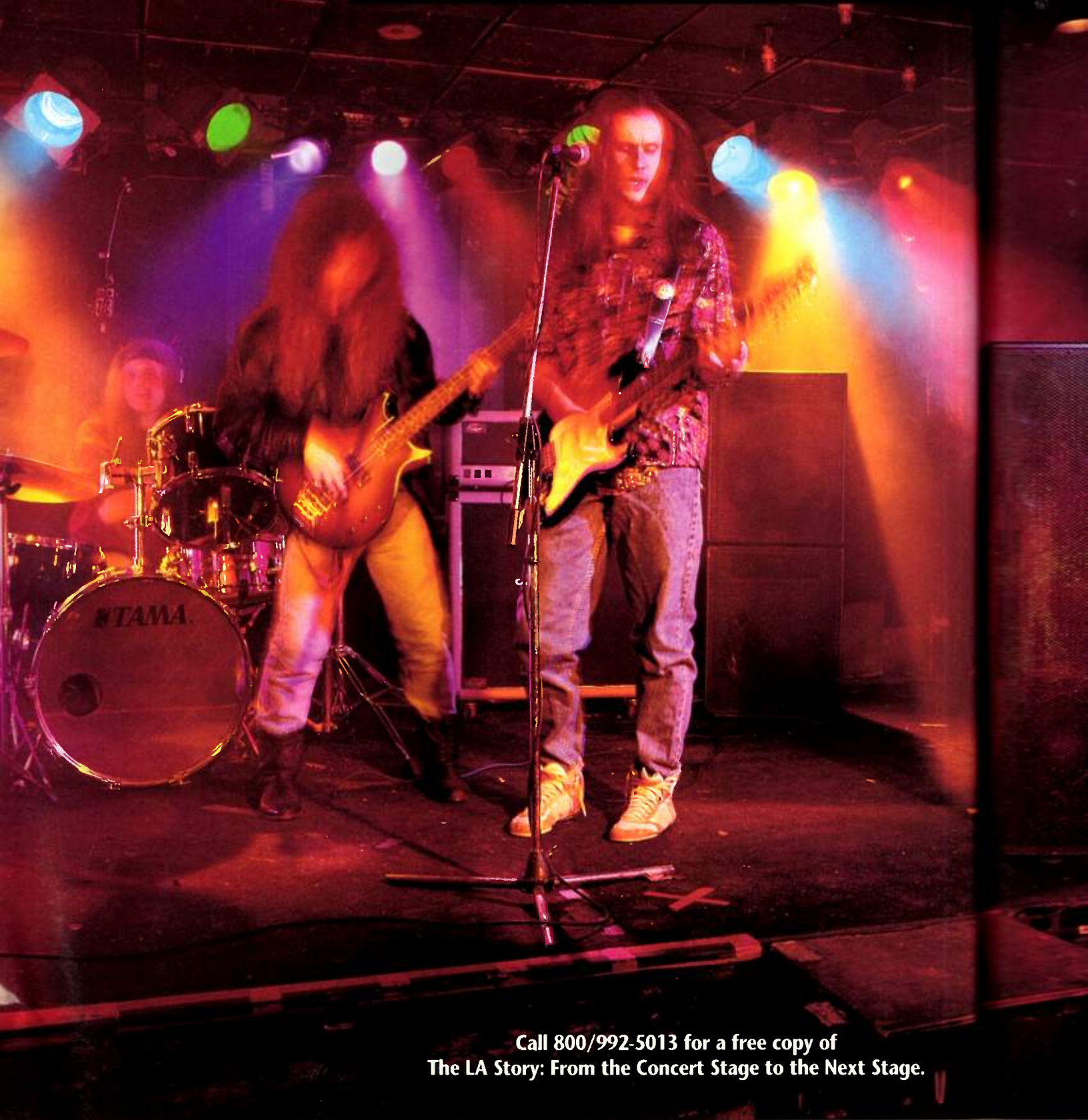
**Community**

PROFESSIONAL LOUDSPEAKERS  
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The advertisement features a background with a purple-to-blue gradient and a large, stylized wheel graphic. The text '...what Sound Barrier?' is written in a bold, italicized, blue font with a yellow starburst at the end. Below this, the 'Community' logo is displayed in a black box with a yellow star. Underneath the logo, the text 'PROFESSIONAL LOUDSPEAKERS' and 'CIRCLE 15 ON FREE INFO CARD' is written in a smaller, white font.



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# HARD WORKIN' MEN



**GONE COUNTRY:** Brooks and Dunn go wireless with AKG's WMS9000 Series 12-channel system.

BOB BUTLER is one of country music's best-kept audio secrets. In his 29 years of mixing live sound he has worked with country music notables such as Waylon Jennings, The Oak Ridge Boys, Randy Travis, and the Statler Brothers. Bob's current assignment is front-of-house engineer for the hugely successful Brooks and Dunn tour, which is one of the more elaborate productions out on the road in the United States. Since Butler has been in this position for the past several years, he has had the chance to refine the band's live set up to the point where they use almost no on-stage amplification.

"Our monitor engineer Dave Haney (alias 'Hud') and I designed a rack system with multipin connectors so that almost everything from the stage can go direct, including Jimmy Mattingly's fiddle and Troy

Klontz' steel guitar. The only live mics on-stage are for vocals and the drums. Tony King (rhythm guitar) and Charlie Crowe (lead guitar) have small Fender cabinets with one 12-inch speaker in each, and we had sealed boxes built around them. We have AKG C5600 condenser mics mounted inside the boxes and they stay latched shut. The mics are attached to podium-type mounts and sit about two inches from the grille cloth. Since the C5600's have a threaded mount built-in, I don't have to worry about a mic clip coming loose. There are only two live speakers on stage, and those are part of the monitor system.

"There is no bass amp — we usually use a passive Horizon DI box. Duane Rowe's keys are also taken direct, but they're not pre-mixed. I like to have more control than that. His piano

patches are in stereo and various other sounds (primarily organ) come in on two more channels. So it's all on four channels and it's manageable."

Butler is using AKG mics exclusively. For the drum kit he uses D3600's on the kick and floor tom, D3400's on the rack toms, and a C5600 on the snare. When asked why he is using a large-diaphragm mic on the snare, Bob elaborates: "It's unusual, but I really like it. I used the AKG C747 for years, but I like the warmth of a large-diaphragm mic on the snare. I use a C391 Blue Line to mic the hihat, a C461ULS on the ride, and a pair of C414's for the overheads. I like to get in close

with the overhead mics and put on a pretty hard high-pass filter at around 600 Hz. I use the 414's primarily for the cymbal work, not to try and color the rest of the kit, and since they have a limited bandwidth I find I don't really need to compress them."

**PUTTING HIS TWO CENTS IN**  
"For backing vocals I use C535's, which really cut through. I have an Eventide H3000SE that I use for a pitch-shift/delay on the backing vocals. I set the pitch-shift for two cents sharp and add a 2 ms delay just to thicken the background vocals."

For the all-important lead vocal microphones, Butler has been using the

**THE BUTLER DOES IT WHEN COUNTRY'S MOST DYNAMIC DUO HITS THE ROAD**

**BY STEVE LA CERRA**

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**TODAY** the MS1202 is at work in thousands of home studios, video post production facilities, corporate multimedia department, radio stations and film location shoots. We even know several recording engineers who bring an MS1202 along with them on sessions. They use it for submixing effects and for its superior mic preamps — even when the session is being done on a mega expensive console.

In fact, the MS1202 is so successful that it's spawned a host of eager competitors. But only the original has received accolades not just from pro audio magazines, but from video, broadcast and even consumer audio reviewers. Only the MicroSeries 1202 is currently used in facilities as diverse as NASA, CBS Broadcasting, AT&T, Yanni's percussionist and Phillips Interactive Video<sup>2</sup>.

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<sup>2</sup> mention in this ad denotes ownership and/or usage but not official endorsement.

"Overall winner in grading categories" *Keyboard Magazine Under-\$600 Mixer Shoot-Out*



"In spite of the unit's diminutive size, it's easy to work all the controls. There's space around each knob for your

fingers ... all inputs and outputs are on the top, making it simple to interface with your system. From its military-issue steel construction to top quality electronics, the little board is over-engineered. It offers stunning audio quality, tons of flexibility, sturdy construction and a palatable price tag." *Videomaker Magazine*



"I can't say enough good things about the workhorse Mackie MicroSeries 1202. It is an absolutely essential audio tool in my daily work. I would be at a loss without it. The more I think about it, the MS1202 may just be one of the best audio bargains of all time." *Radio World Magazine*

"This little mixer has the same electronics as Mackie's incredibly popular CR-1604. The 1202 is billed as a 'low noise, high headroom mixer' and it certainly lives up to its word. The board has a very clear, clean, quiet sound. For home and studio recording applications, I can see the board becoming equally popular as a 'starter unit' and as an auxiliary mixer." *Recording Magazine*

"GRADE: A. One of the product wonders of the pro audio world, the MicroSeries 1202 mic/line mixer is priced so ridiculously low that audiophiles can make good use of it for home recording projects. I tried it with a CD player via the tape inputs and found its sound as clean as that of some audiophile stereo preamps costing twice the price." *Audio Magazine*

<sup>1</sup> Suggested retail price. Your mileage may vary. Price is slightly higher in Canada and outer reaches of the Spiral Nebulae.

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**KIX'S HABIT: Kix Brooks**

new AKG WMS900 Series UHF wireless system. "It is possibly the finest carrier system I have ever worked with. It's a three-space, rack-mount unit with plug-in modules, each accommodating a pair of frequencies for a total of 12 channels. The handheld mics are switchable, so if you get stepped on at any of the frequencies you can tune them to another channel. Everything is contained within one TV channel, and we are on 12 different frequencies in that band. A pair of antennas sit on either side of the stage and the system has never glitched once. Kix and Ronnie think it's the best they have ever used. We place the receiver box in Hud's monitor world, which helps make his life hell but he can handle it!"

**MAKING THE CHAIN**

Processing on the two lead vocalists is done using a Drawmer 1961 tube equalizer sidechained to a Drawmer 1960 tube compressor. The mic signals

from the wireless receivers are input to channels on Butler's Midas XL348 mixing console and the Drawmer units are patched in via inserts on the respective channels. He is also using Drawmer 1960's on the guitar DIs. "The guitar DIs tend to thin out, so I try to keep them a little warmer with the Drawmer." Rounding out the effects are a t.c. electronic M5000 and an AMS RMS16 for the drums.

Butler has an interesting technique for maintaining consistency with his reverb

sounds: "I use another Drawmer 1960 to squeeze the input to my reverbs. I find that if I set the sensitivity for someone singing softly, when they scream I overload the input to my 'verb. Then if I set my sensitivity to catch those transients when they scream, they sing softly and I don't have enough reverb. So compressing the input narrows that window and I have more usable 'verb more of the time."

**INTO MONITOR LAND**

As previously mentioned, the Brooks and Dunn stage contains only two speakers. These two 18-inch woofers are mounted underneath the stage and serve to add low-end to the monitor mix for bassist Danny Milliner and drummer James Gunn. The entire band is using in-ear monitor systems from Future Sonics and Butler notes that getting rid of all those traditional stage monitors allows him to actually mix the show and not just fill in the gaps. "We have



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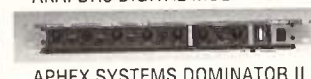
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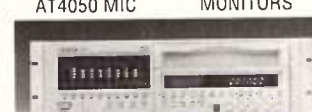
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been trying to aim Danny and James to these 'shakers' that Future Sonics makes. They are basically drivers with no cones, driven with a standard power amplifier. They can bolt to the drum throne or a stage section and it's amazing the concussion that you get from them. You can't hear them, but they give you the concussion that comes along with the low frequencies. But we are having a hard time weaning these guys off of their 18's — they like to feel their pant legs shaking. The trouble is that the ear monitors (when fit properly) are acting as ears plugs. So these guys are really not hearing the low frequencies that they are achieving with the 18's and they tend to turn them up. When the stage is virtually silent, the 18's are pretty evident. It's not mic leakage — it's that the sound shoots up into the room, hits the ceiling, and wraps around the stage. It's acoustically out of phase with what is coming out of the PA and it tends to slur my low end a little bit."

#### **MAINTAIN A SOUND IMAGE**

Sitting nearby the FOH console is a rack housing a Macintosh Quadra 660 computer with a 13-inch monitor, a mouse, and a keyboard. This allows access to the Lone Wolf Media Link system, which controls the 88 QSC amplifiers powering the PA. Butler, along with David Shadoan and Everett Lybolt of Sound Image (San Marcos, CA), have engineered this PA system to use Media Link for monitoring and control of the QSC units.

Butler describes it as an amplifier management system. "I can bring up a screen that has a graphic representation of my hang

*continued on page 123*

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The AKG C577 dual-diaphragm condenser microphone is smaller than a pencil-end eraser, and AKG boasts that it is the world's smallest mic in its class. Because the C577 utilizes two side-mounted diaphragms, the total diaphragm area is doubled when compared to similar, single-diaphragm capsules. The C577's A-weighted S/N referenced to 1 Pa is 68 dB. Included with the mic is a 3m cable that ends in a phantom power adapter with an integrated XLR connector. The frequency response of the C577 extends from 20 Hz to 20 kHz. An omnidirectional pickup pattern produces a naturally open vocal sound. The design of the capsule assembly virtually eliminates mechanical noises from cable movement. For more information, contact AKG Acoustics, 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-895-3426. Circle EQ free lit. #133.

## TWO-IN-ONE

Looking for amplification as well as DSP features? The engineers at Yorkville have got a mixer that fits the

description. The new eight-channel MP-8DX joins the Micromix series and features fan-cooled dual-power amplifiers that deliver 400



**Yorkville MP-8DX**

watts @ 4 ohms to the mains, while the monitors receive 200 watts @ 2 ohms. The MP-8DX also features a built-in digital reverb/echo with 255 presets, separate graphic EQs for the mains and monitors, and phantom power. Each channel sports bass/treble controls, effects and monitor sends, and balanced XLR and 1/4-inch phone inputs. Other features include 3/4-inch Canadian poplar plywood construction with carpet covering and black hardware. Retail price is \$1099. For more information, contact

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Need a dual-powered, 4-channel professional MOSFET box-type rack-mount mixer with built-in digital echo that allows you to drive the main speakers and monitors from one unit? Check out the Samick Box Mixer. Its stereo MOSFET amplification system features 100 watts per side. Each of the four channels has a bal-

includes a variable repeat control as well as variable delay. The entire package fits in a three-space rack. And as with all Samick products, the dual-powered box mixer is covered by Samick's 10-Year Bullet Proof Protection Plan. For details, contact Samick, 18521 Railroad Street, City of Industry, CA 91748. Tel: 800-592-9393. Circle EQ free lit. #135.

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YOUR BAND hasn't quite arrived at the Aerosmith status just yet, and so you can't always play as loud as you'd like or have consistent control over the house PA. What's a guitarist or bassist to do? Answer: leave your amps at home. In some live situations, you really can do this without sacrificing sound quality.

## I'VE GOT NO AMPS

You've decided to try a gig without using stage amps, and here is your next step. Run your guitar or bass direct to the FOH mixer using an amp emulator. For the uninitiated, an amp emulator is not just your ordinary preamp. It is a rack-mount (usually) amp simulator/direct box for guitar and/or bass, and is designed to emulate guitar amp sounds for in the studio as well as on the road. Some amp emulators provide you with a sufficient number of outputs to allow you to run your signal to an

external effects processor or external distortion unit on stage before reaching the FOH mixer. Doing that is a personal choice. Running your signal direct to the FOH mixer using an amp emulator is about as direct as you can get, and it gives you several advantages.

1. Running your instrument direct to the FOH mixer gives you 100-percent isolation from ambient noise, including leakage from other cabinets, and mic feedback. You also get signal consistency night after night and gig after gig no matter what venue you are in.

2. Going direct gives the FOH engineer a greater degree of control over room volume, which is key when dealing with uptight club owners and in protecting the audience members' ears.

3. A popular reason to consider going ampless is that you are greatly reducing the dreaded "schlep" by

a considerable amount of pounds.

4. Doing without can also increase the presence of your guitar or bass in the mix. Some players using amp emulators will send a DI feed to the FOH console while a second channel is dedicated to a miked cabinet. The direct emulator channel can provide a strong and present guitar signal that differs from a miked cabinet, and it can push the signal forward in the mix.

5. Going direct with amp emulators reduces time spent during sound-check because your signal remains consistent.

6. Stage monitoring takes on new meaning. Performers will hear themselves more clearly because their ears are not battling high stage volume levels.

There is another side to all of this as well. For one, going direct using these emulators requires a certain amount of tweaking to get that "perfect" miked cabinet sound, and for some there is no substitute. Though great for the FOH engineer, performers are

forfeiting some of their personal control over their overall perceived signal.

## WHERE DO I SIGN UP?

Here's a look at some of the amp emulators that are currently available:

For those of you unfamiliar with the Tech 21 SansAmp PSA-1 (\$795; it was reviewed in the August, 1992 issue), it is a rack-mount tube amp simulator/direct box for guitar and bass designed to emulate classic (and otherwise) guitar-amp sounds for both stage and studio.

Tech 21 products are designed for full-range systems as well as guitar/bass speaker cabinet applications. And in the case of the SansAmp PSA-1, its Universal Output section promotes a variety of set ups. It can be used in the studio to record direct to tape or to add some color to existing tracks during mixdown. For live gigging, the SansAmp can be used as a preamp direct into a power amp with guitar or bass speaker cabinets, as an outboard processor, or as a direct feed to the PA system.

**THERE IS AN ALTERNATIVE TO PLAYING LIVE THROUGH AMPLIFIERS**

**BY LIANA JONAS**





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**EMULATE THIS:** Tech 21's SansAmp PSA-1.

### FEEL THE GROOVE

Groove Tubes offers the STPG-II studio tube preamp/amp with speaker emulator (\$1195) for your direct-to-PA needs. The STPG-II has three basic stages of circuitry that can be used separately or all in combination: the Tube Guitar Preamp stage, a 35-watt Class A/B and Class A selectable Tube Power Amp stage, and the patented GT Speaker Emulator stage. There's also a parallel effects loop with Wet/Dry balance control. This circuitry allows for insertion of digital effects without loss of tone. The loop splits the signal from the SE stage into two parallel signal chains. The first chain is dry while the other is passed to an effects unit via the Send jack, and is then returned via the Return jack. The two signal chains are then mixed together with the Loop Balance Control.

### MARSHALL IN A BOX

The Marshall DRP-1 (\$199 list) Direct Recording Preamp features a full range of Marshall tones. It was designed for studio recording applications, but can also be used on stage. It has a filtered line out that features Marshall emulation and plugs directly into the FOH mixer. It features two manually switchable gain modes (normal and boost) and front-panel controls for preamp volume, master volume, bass middle, treble, and line level.

### TECH HEAD

DigiTech has put its two cents in as well with the GSP-2101 (\$1099.95) and

the GSP-2101LE (\$1399.95) studio tube preamp/processors. DigiTech, known for their bits and bytes, combines S-DISC (proprietary CPU) processing with tube-driven guitar tones. Two 12AX7 tubes serve as the origin of the distortion sounds in the standard model, while a pair of hand-matched Groove Tubes are used in the LE model. Fully programmable effects algorithms provide users with control as well as creative flexibility. DigiTech's guitar processors have been designed for use on the road and in the studio, and are equipped with switchable cabinet emulation for direct input to a console. These units are a bit more pricey — perhaps because of some of the features they have: MIDI continuous control of any parameter with up to 10 per program, a 24-bit signal path, and a PPC-210 expansion card that gives the storage capability of two S-DISCS for larger algorithms.

### SPECIAL FEX

Peavey's contribution to the direct-to-PA market is the new Tube Fex (\$899.99). It is a MIDI-controllable guitar tube preamp combined with a 24-bit stereo digital effects processor in a 1U chassis. The four tube

modes, Clean, Crunch, Lead, and Ultra, are made possible by the two 12AX7 tubes, and are accessed with the push of a button. (The two tubes are driven at their full-rated 250 volts). When the Tube Fex is first in an effects chain, the input signal goes directly to the tubes without first going through analog-to-digital conversion. Also, the tube preamp can be used simultaneously with the unit's available digital distortion or overdrive. The 24-bit digital effects processor has 128-user and 128-factory presets, and a RAM card slot for saving or transferring 128 additional patches. There are 37 effects types that can be programmed seven at a time in a patch.

### WHO'S ZOOMIN' WHO?

Zoom's (part of Samson Technologies) Zoom Valve DSP 9150 (\$599.99) is another vacuum tube preamp that couples the digital domain with tube technology. The Zoom unit uses one 12AX7A vacuum tube in the preamp section. A solid-state overdrive circuit located before the tube generates the DSP 9150's "Original Overdrive" and other voicings. Zoom also provides 99 user and 99 factory presets and two external effects loops. Loop 1 is used for when you want to insert additional overdrive/distortion units, while Loop 2 is designed for insertion of external effects devices.

### GO TO THE XTREME

The ART XTREME personal distortion processor (\$249) is a preamp/processor pedal that also can be run direct from the stage to the FOH mixer. Guitarists achieve different sounds using the gain (drive) control for saturation, the 3-band EQ with sweepable mid for color, the output level of the distortion section, and the Blend control for mixing between the distorted signal and the 32 onboard digital effects. The XTREME's internal distortion circuitry provides three analog distortion types: XTREME, Scream, and Retro. The engineers at ART recommend that users apply equalization to the signal when striving to simulate a speaker cabinet sound. If you need more EQ, you might want to put an external equalizer in the mixer's channel insert.

### WHAT TO LOOK FOR

Here are some questions to ask yourself (and the salesperson) when researching amp emulators. Does the unit have both sends and returns? If so, are they mono or stereo? Does the unit sport 1/4-inch jacks only, or does it also come with XLRs as well? Are they balanced? How many effects programs does it have? How many factory and user presets are there? Once you determine what kind of sound you want to achieve and how much you can spend, you'll be leaving your amp at home in no time. **EQ**

## WHERE TO FIND IT

- Tech 21**, 1600 Broadway, New York, NY 10019. Tel: 212-315-1116. Circle EQ free lit. #137.
- ART**, 215 Tremont St., Rochester, NY 14608. Tel: 716-436-2720. Circle EQ free lit. #138.
- DigiTech**, 8760 So. Sandy Pkwy, Sandy, UT 84070. Tel: 801-566-8800. Circle EQ free lit. #139.
- Groove Tubes**, 12866 Foothill Blvd., Sylmar, CA 91342. Tel: 818-361-4500. Circle EQ free lit. #140.
- Marshall**, 89 Frost St., Westbury, NY 11590. Tel: 516-333-9100. Circle EQ free lit. #141.
- Peavey**, 711 A Street, Meridian, MS 39301. Tel: 601-483-5365. Circle EQ free lit. #142.
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<b>Phone Number</b> _____	<b>Running Time</b> _____
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<b>Equipment and format used</b> _____	
<b>Entrants Signature</b> _____	

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# FIBER OPTICS IN PRO-AUDIO

FIBER-OPTIC technology has been in use since the '60s. Its use was restricted to the telecommunications industry then, but since has been creeping into other industries as the costs drop and the appropriate converter technology has developed. The professional audio industry has been talking about fiber-optic transmission for many years, but how many systems have you seen in use? The live-sound industry has remained both skeptical and very price-conscious. The cost of fiber-optic systems has partially been limited by the extreme demands that the live sound industry has insisted upon. Then throw in the fact that the system must be bulletproof and capable of being driven over by a truck after it has bounced out of one would be enough to stop all but the most tenacious manufacturer. The good news is that a few companies were that tenacious and have developed systems that meet these criteria in a variety of forms.

These companies have produced systems that realize the many advantages of fiber-optic transmission. Here is a brief overview of these advantages.

**SIZE:** The most obvious benefit is the reduction in the size of the multicable. A multimode (62.5/125 um) fiber-optic cable can carry a very large number of wide-bandwidth signals. Many of the current pro-audio systems carry up to 64 channels of audio plus various forms of control signals over a single fiber. This cable can range in

size from tiny cables much smaller in diameter than a mic cable to the extremely rugged Kevlar-jacketed versions that are the size of a typical RG-59 coax cable. Fiber-optic cables are also

The more expensive systems require less skill to make a good splice or termination.

Fiber-optic converters are especially cost-effective when you must terminate large numbers of cables or

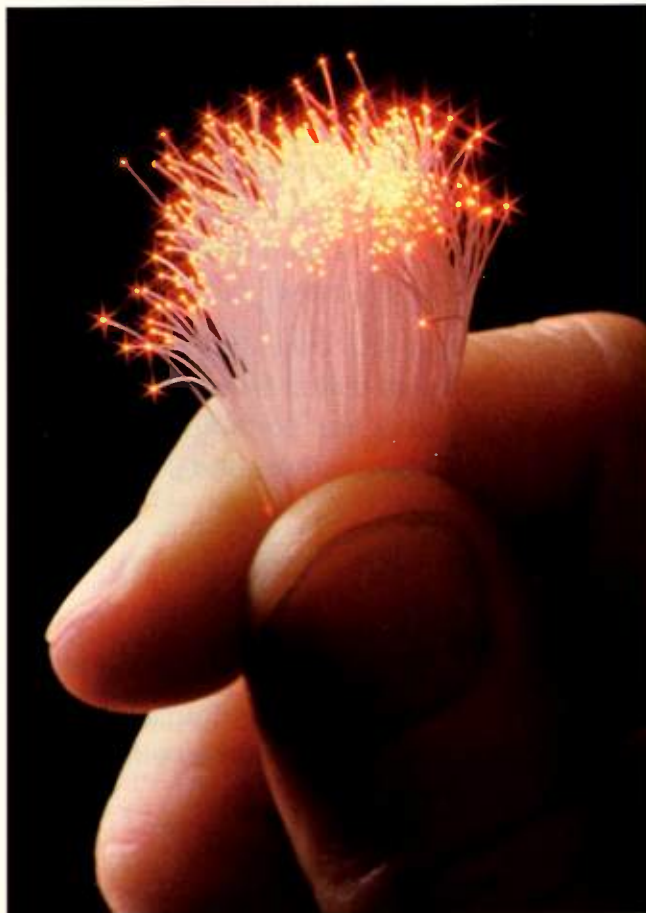
require specialized tools and a little practice, much like any new connector. The technology is different, though, instead of solder the fiber is typically glued, crimped, or melted together.

**RELIABILITY:** Fiber-optic cable is as rugged as most copper cables when handled properly. Preventing the cable from exceeding its minimum bend radius (sharp kinks and tight knots) is similar to copper, which is also damaged by this form of abuse. The Kevlar-jacketed fiber-optic cable is more durable than most common mic cables, withstanding both crushing and slashing.

If the fiber is disconnected, damaged, or broken, well-designed systems will instantly mute the audio without any nasty noises. Due to its small size, it is easy to include a backup cable that can be switched into circuit in the event of failure in the first cable. More sophisticated systems can handle this switchover transparently.

**GROUNDING:** Once the audio signal is digitized and converted to optical there are no further electrical connections. This breaks any connection between grounds within the system and offers the user complete freedom from the problems associated with having ground signals of two different potentials in a system distributed across a building or even between sites that are miles apart. No more ground loops!

**TRANSMISSION LOSS:** We associate longer mic lines with diminished audio quality due to signal loss caused by resistance, capacitance, and inductance in the (copper) cable. Fiber-optic cables were first developed because of their ability



considerably lighter than their copper counterparts.

**COST:** A typical fiber-optic cable for audio applications can be purchased at about the same cost as high-quality mic or coaxial cable. Connectors are not very expensive, but the termination tooling is inversely proportional in cost to the skill of the person using them.

mix incompatible signals in a single conduit or cable tray.

**TERMINATION:** The connectors used for fiber-optic cables come in several varieties developed primarily for telephone and data-transmission applications. Common optical connectors are the ST, STC, SMA, and SC types. The ST connector looks like a tiny version of a BNC connector due to its bayonet-style of latching.

Installing a fiber-optic connector is now about as complicated as installing a BNC connector. It may

SEE THE LIGHT ABOUT THE BENEFITS  
FIBER-OPTICS CAN GIVE YOUR SYSTEM

By WADE MCGREGOR



to carry signals great distances with negligible loss because they do not suffer from these electro-magnetic effects. Although the optical power does diminish over distance, it is several orders of magnitude less than the losses in typical copper cable. Transmission distances of several miles are common to most multimode fiber-optic cable systems.

**VERSATILITY:** Some fiber-optic systems can cross-patch or split the signals while they are still in the optical format. This is the ideal form of mic split for on-stage monitors, multiple house mixers in large productions, or recording and broadcast trucks. Some modular systems allow a variety of signal types to be distributed on a single fiber-optic cable and retrieved by simply attaching the appropriate converter module. This allows each person on the system to have access to his or her signal without interfering with other users. Computer-control signals for the sound system have also been carried along with the audio in some fiber-optic systems.

**NOISE:** There is no radiation or induction from a fiber-optic cable, so it isn't susceptible to noise problems caused by incompatible adjacent signal lines or noise sources (such as power lines, transformers, or electric motors) that can make audio signals carried in copper cables noisy or even unusable.

**SAFETY:** Fiber-optic systems offer a few safety features as well (barring someone pointing an active fiber into his eyes). The very fact that the typical fiber-optic cable does not conduct electricity can be important in some situations. This feature prevents accidental connection of the cable to power lines and not conducting lightning or creating sparks.

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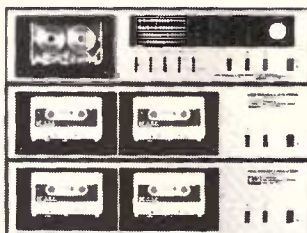
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# LSi FIBOX FIBER OPTIC SYSTEM

LIGHTWAVE Systems, Inc. (LSi) licenses some of its technology from Lester Audio Laboratories, one of the early developers of fiber-optic systems for pro audio. The original work concentrated on the development of fiber-optic snake systems that would carry large numbers of audio signals between remote locations. The Lightwave Systems products concentrate on smaller-scale applications of this technology that can be expanded or distributed as required to suit different applications. For many users, this means they can buy a few Fibox systems and change the configuration each time they are used. These Lego-like boxes may be used as a 2-channel mic preamp for recording on one day and on the next day as a distribution system to serve live sound and broadcaster mixers simultaneously. The great advantage of fiber systems is their ability to provide absolute isolation between the inputs and outputs of the system. No hum, no buzz, and no short circuits.

The LSi Fibox system is a series of 1/3-rack-space-wide interlocking modules (1 U high) that can be combined in various configurations to allow up to 12 channels of audio to be sent down a single fiber-optic

analog audio through a 20-bit D/A converter. These two solid little black boxes could easily be used just as a high-quality mic preamp in anything from location recording to a project studio; the fiber-optic aspect

and other forms of data. Optional rack-mount ears allow the units to be installed into a standard rack.

The FBAl-M front panel features two identical input sections with a flush-mounted gain control and mic/line level selector switch. There are also switches for 48 V phantom power (mic level only) and the power switch. A green LED indicates power and two red LEDs next to each of the gain controls indicate clipping (OL). The connectors are mounted on the rear panel: two female-XLRs for audio in; a 15-pin sub-D connector for stacking audio from up to 12 units onto a single fiber; the ST-type fiber optic connector; and a coaxial power connector. There is also a polarity switch for reversing pins 2 and 3 on input 1 of the unit.

The FBAO-M front panel simply offers a stereo headphone jack to quickly verify the presence of signal, a power switch, and the green LED power indicator.

*continued on page 123*



**DUELING FIBOXES:** The FBAl-M (top) and the FBAO-M.

cable. I was supplied the first two production modules available in this series: the FBAl-M, a 20-bit A/D 2-channel fiber-optic interface with mic preamps; and the FBAO-M, a fiber-optic interface that outputs 2-channel

might simply be a bonus. There are also modules in this series that provide AES/EBU digital outputs for direct connection to a DAT recorder or digital workstation, and interface modules for SMPTE timecode signals

## ROAD TEST

**MANUFACTURER:** Lightwave Systems, Inc., 900 Jackson Street, Suite 700, Dallas, TX 75202. Tel: 214-741-5142.

**APPLICATIONS:** Modular stereo converters for sending interference-free audio signals over fiber-optic cables up to 2.5 miles in length.

**SUMMARY:** A high-quality mic preamp combined with 20-bit A/D and D/A converters to provide ground-isolated optical transmission of audio signals.

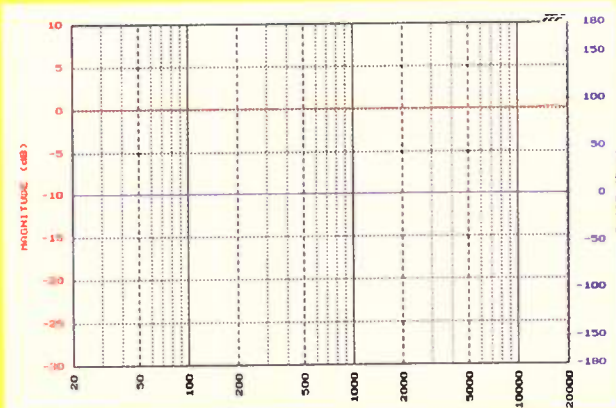
**STRENGTHS:** Extremely low noise and distortion, offering the user a cutting-edge technology for the price of a good mic preamp.

**WEAKNESSES:** New technology with connectors you won't find at Radio Shack for a while yet.

**PRICE:** \$749.50 per module; \$1499 per 2-channel system as reviewed.

EQ FREE LIT #: 144

**BY WADE MCGREGOR**



**FIGURE 1:** The LSi Fibox system has an extremely flat frequency response (red) and phase response (blue) throughout the entire A/D, fiber-optic link, and D/A signal chain.



# EQ SHOPPER

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# IN REVIEW

## Yamaha MU80 Processor



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

**SUMMARY:** Tone generator and multieffects processor

**APPLICATION:** Multimedia development tool and playback device; musician's supplemental "box of sounds" and effects processor.

**STRENGTHS:** First instrument to implement Yamaha's new XG format; 64-note polyphony with 32-way multitimbral capability; two external audio inputs; broad range of onboard effects and flexible effects routings; good sound quality with exceptional low-frequency response.

**WEAKNESSES:** No RAM for the storage of edited individual voices or effects; no effects bypass switch; Performances cannot be accessed during multitimbral operation; convoluted user interface; skimpy documentation.

**PRICE:** \$895

**EQ FREE LIT #:** 145

WHAT WE have here, O Chef of the Future, is the Yamaha MU80 — it slices, it dices, and, yes, it can even

core a apple. Well, not quite, but the MU80 is a versatile musician's tool that can be used in a number of differ-

ent ways. It's also the first instrument to implement Yamaha's newly announced XG format (see sidebar), designed to act both as a 32-way multitimbral "box of sounds" (with 64-note polyphony) for the playback of MIDI music files, and as a tabletop tone generator to supplement MIDI keyboards. What's more, thanks to the provision of a stereo audio input, it can be used as a stand-alone multieffects processor.

The key to MU80 operation is a front-panel button labeled "Mode." This enables it to function as a true XG instrument, implementing the full range of XG features, or as a standard GM or GS-compatible instrument. In any of these modes, individual voices ("Parts") can be muted or soloed as desired. A fourth option is called "Performance" mode, where up to four





## ABOUT XG

Standards, sure we need standards...lots of 'em! First there was MIDI, then there was General MIDI (GM), followed almost immediately by Roland's General Synthesis (GS). Now Yamaha strikes back with the announcement of XG (we're told the initials don't stand for anything, although they certainly imply an "X-tended" General MIDI), which the company is careful to describe as a "format," as opposed to a "standard." XG expands upon both GM and GS in a number of ways, though it is completely upwardly compatible with GM (that is, all XG instruments adhere to the GM rules) and somewhat compatible with GS. These improvements include a provision for many more than the 128 voices supported by GM (through the use of MIDI Bank Select messages); support for at least three MIDI-controlled internal effects; a bunch of new recognized controller and system exclusive messages; the ability to designate multiple rhythm channels (instead of just one); and, most interestingly, MIDI control over at least one external audio input channel that passes through an onboard A/D converter before being routed to any or all of the internal effects and blended in with the tone generator signals.

XG has been designed to provide a base from which future instruments can cope with the demands that the future will impose. Yamaha is currently investing a lot of time and effort into spreading the XG gospel and have reportedly received commitment from a number of third-party software developers. Only time will tell if XG is the "next big thing," but there's no question that Yamaha has upped the ante significantly with its introduction.

voices responding to a single user-designated MIDI channel can be played in a layered, velocity-limited, or split fashion. In all four modes, the large back-lit LCD shows a great deal of information, including a bar-graph display that shows incoming velocity values (thus acting like a continuous level meter) and numerous graphic icons that make it easy to determine things like the class of instrument being reproduced and effects send levels.

All MU80 voices are sample-playback only — there's no FM here — and the quality of the sounds range from fair to excellent. The orchestral voices are quite realistic — much more so than any I've heard from an under-\$1000 instrument. Though some of the keyboard and guitar voices are lackluster, there are some killer bass and wind instrument sounds. Many of the drum samples are crisp and well-recorded, but a few are reminiscent of the bad old days when Yamaha drum machines were the "Rodney Danger-

fields" of the synth world (they got no respect).

I did some comparative listening tests between the MU80 and its main competitor — the Roland Sound Canvas (specifically, the upper-end SC88 model), and found that the MU80 delivers much more bottom end (my woofers were moving some serious air!), though not as much midrange presence as the Sound Canvas. Playing back standard GM and GS MIDI files, both instruments did a commendable job (though each had its own identity), but the MU80 left its competition behind in the dust when playing back XG music files. To be fair, the SC88 was incapable of recognizing many of the control change messages (and virtually all of the system exclusive messages) that were being transmitted, but it was clear that it is the tweaking of MU80 voices and effects (via MIDI, as specified by the XG format) that really makes the instrument shine.

Speaking of effects, there's plenty of choices here. Four different effects categories are provided — reverb, chorus, distortion, and "variation" (a duplication of most of the reverb, chorus, and distortion effects, as well as others). The reverb and chorus effects are always configured in a send/return effects loop (with controls over wet/dry balance, send levels, and return level and pan position), while distortion (which can only be applied to one voice) is preset as a unity gain insertion effect. The variation effect can be used in either configuration, and, when in Performance mode, an

external MIDI controller can be used to alter a single preset parameter (usually wet/dry balance) in real time. The effects can be used in series (with varying degrees of serial routing) or in parallel. There's also a master 5-band graphic equalizer, with four different presets that change the center frequencies as well as amount of cut and boost in each frequency area. Disappointingly, there is no master effects bypass switch — disabling all effects is an operation that requires many button pushes.

The MU80 effects are all derived from a new chipset, so they sound a bit different than previous Yamaha signal processors. The reverbs are all pretty good, with some graininess, but not overly "digital." The chorus and variation effects provide all the basics — there's not much here you haven't heard before, but all is accomplished in a solid, workman-like manner. Perhaps most outstanding are the distortion effects, which are clearly optimized for guitar signals, adding realistic overdrive and fuzz.

Two audio inputs allow you to route any external line or mic-level source into any or all of these effects, allowing the MU80 to act as a stand-alone signal processor. Incoming signal from these "A/D channels" is routed to the unit's internal A/D converter and then mixed with the tone generator sounds. You can choose from a number of A/D channel presets, which provide various useful mic, guitar, keyboard, and stereo audio settings,

*continued on page 123*





# Mixed Bag: Tubes, Trans & Op Amps

A primer on the wonders of amplification

BY EDDIE CILETTI



There is no denying the trademark sound of analog tape and its vinyl offspring. Though these forms of analog storage are electro-mechanical in nature, their common thread is amplification.

The inspiration for this article came as a direct result of reviewing

some of the more eclectic products featured in this issue. The latest design trend — Retromania — has manufacturers responding with great vigor to the demand for vintage-style gear. This time around, though, the vacuum tube has a little help from its friends.

Viewed from the present, vintage circuitry could be categorized as minimalist. In a Pultec EQ or an LA-2A limiter, for example, the audio signal passes through four tubes. That's four stages of amplification. On the other hand...

Modern gear uses a similar number of amplification stages, but each stage is now an IC op amp consisting of nearly two dozen transistors. The result is linearity; the translation: clean audio until you run out of headroom, followed by clipping, the nasty distortion we don't like.

Vintage circuitry does sometimes yield a wider area of nonlinearity than its modern counterpart. This more subtle form of distortion — the equivalent of inserting a sonic air bag between clean, linear amplification and hard clipping — is a direct result of both the number of amplification stages and their classification.

It takes but a single tube or transistor to amplify; the results are surprisingly musical although the specs are not. The op amp easily meets the goal — amplification with minimal noise and distortion — although it does so with far less character.

## ENTER, STAGE ONE

You can view three, single-stage amplifiers — transistor, tube, and op amp — in fig. 1. A sine wave is placed at the input and output of each stage to show that the "side effect" of voltage gain is phase inversion. (The polarity of the audio signal gets flipped 180 degrees.) A signal passed through two-voltage amplifiers will be returned to its original polarity.

It is important to note that the peak-to-peak value of the output signal, which is an alternating current (AC), can never be larger than the power supply voltage. (The latter is called Direct Current or DC, the stuff that batteries produce.) Attempts to exceed the power supply's juice will result in a clipped waveform.

## CLASS SYSTEM

It might help to remember that the British refer to tubes as "valves." The analogy — the ability to control current flow as if it were a liquid — applies to both tubes and transistors (see fig. 3). The goal is to open the "valve" to its halfway position to make certain that both halves of the wave will be amplified symmetrically.

The squiggles in fig. 1 are resistors. R1 and R5, for example, are a voltage divider that feeds a percentage of the DC power supply to the input of the transistor. When the tube and the transistor are turned halfway on, current flows through resistor R4 and the

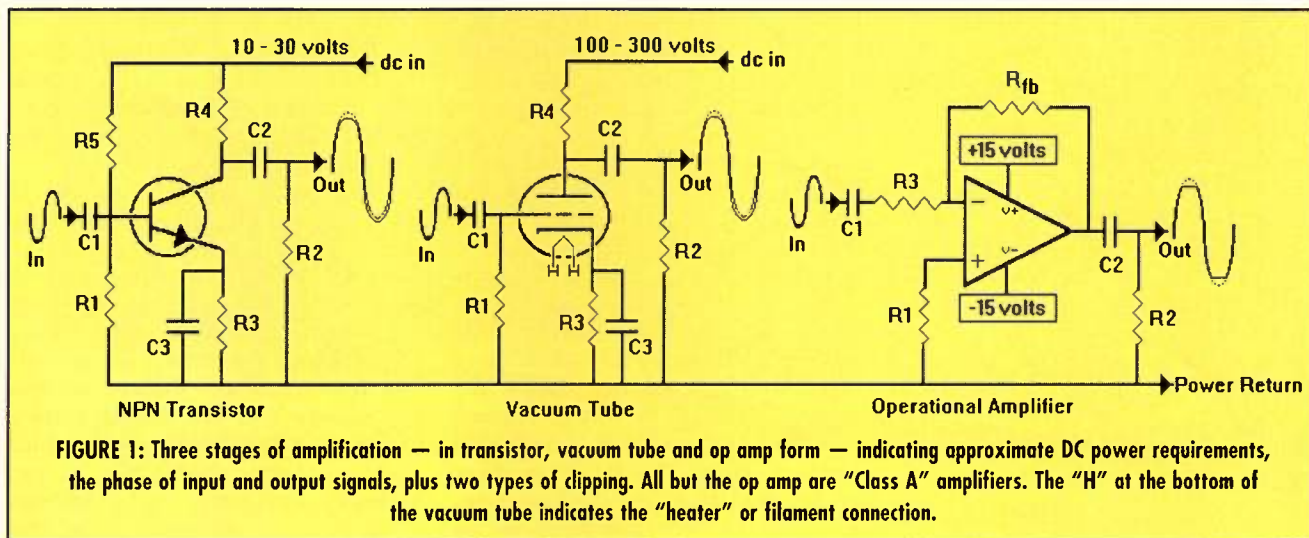
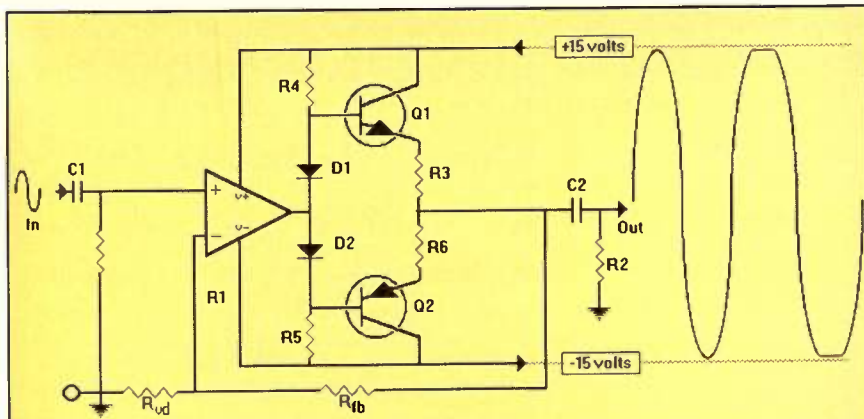


FIGURE 1: Three stages of amplification — in transistor, vacuum tube and op amp form — indicating approximate DC power requirements, the phase of input and output signals, plus two types of clipping. All but the op amp are "Class A" amplifiers. The "H" at the bottom of the vacuum tube indicates the "heater" or filament connection.





**FIGURE 2:** An IC operational amplifier buffered by a transistor pair. Resistors R3, R4, R5, and R6, plus Diodes D1 and D2 bias transistors Q1 (NPN) and Q2 (PNP) into Class AB mode to minimize crossover distortion. Note the use of the op amp's noninverting signal input and that the voltage divider (Rfb and Rvd) sets gain by feeding a portion of the output into the inverting input. This is called "negative feedback."

voltage across R4 is approximately half that of the DC power supply.

When gain structure is correct, the audio signal modulates the valve to be both more opened and more closed. Beyond full "on," amplification stops and saturation begins. Off is off, although there is such a thing as a leaky valve.

A single device, responsible for all 360 degrees of amplification, is said to be Class A. When pushed to extremes, Class A amplifiers gradually produce distortion that is rarely symmetrical, but not totally undesirable.

The output circuitry of both the typical IC op amp and most power amps is referred to as "Class AB," indicating that two output devices share the load. The op amp in fig. 2 has an additional pair of external transistors to help with the visualization. They also serve to further lower the already-low output impedance. (Doing so helps keep long cable runs from degrading the signal.)

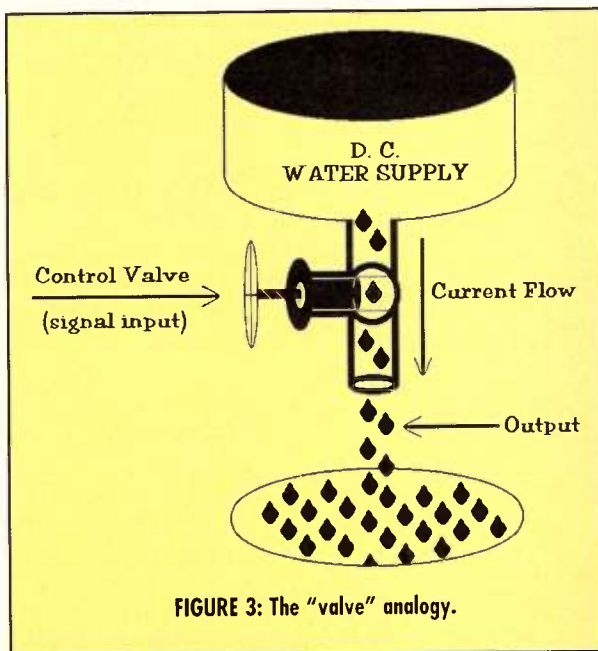
Class B operation is far more efficient than Class A because each device is "on" for only half, or 180 degrees, of each wave. It is not suited to audio applications because there is a gray area at the zero crossover point where neither device has control of the signal. This configuration is typically used to drive traditional DC motors in applications such as capstan, reel, and loading motors.

Biasing each device to be "on" slightly more than 180 degrees of each cycle

reduces crossover distortion. Thus Class AB is born; slightly less efficient than Class B but more efficient than Class A. Class AB designs have the potential to be very linear and produce symmetrical clipping in both transistor and tubular applications.

Some of my future columns will be devoted to op amp, transistor, and vacuum tube projects. The first obstacle will be the power supply. If, from this piece, you interpolated that DC power is a prerequisite, and that amplifying devices are powered by DC and modulated by AC, congratulations!

Vacuum tubes require two power supplies: a low-voltage, high-current filament supply plus a high-voltage, low-current plate supply. If you wish to experiment, but are not ready to convert AC wall power to suitable DC voltages, op amps and transistors can be safely powered from batteries.



**FIGURE 3:** The "valve" analogy.

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## BROOKS & DUNN

*continued from page 107*

for the day and by clicking on any cabinet in the system, the software will show the amplifiers that are driving the components in that box. I can turn them up and down, mute them, solo them, reverse the phase, or just meter them. I might click on a box and turn the highs and high-mids down so I don't slice people's heads off if they are close to the cabinet. During the day we do a burn test — I can mute the whole system, open up one amp side at a time and check every component. The next software update will have an auto mode that will do a half-second burst to every amp side, identify any problems, and then reset itself. We do have hardwire backup, but if the computer should crash the system retains the last set of commands sent to the amps so it won't take the whole system down."

### THE LONG HAUL

On the average, Brooks and Dunn do three shows a week, and Butler notes that this is part of why he enjoys working with them. "We're like weekend warriors, and that is one of the reasons that I like to work with country acts. Almost all country acts are based in or around Nashville and in 24 hours they can reach the entire eastern seaboard or as far west as Denver. So, depending on how far we're going, we'll leave Nashville on a Wednesday afternoon or evening and work Thursday, Friday, and Saturday and be home Sunday. It's nice when your family knows who you are when you walk in the door! In the past we have done five or six shows in a week, but not very often. Kix and Ronnie don't take very well to it. We all find ourselves hitting a brick wall after the fourth show so that's really as far as we'll stretch it. Occasionally, we'll do a four-show weekend if necessary, but we try to stick with three."

### HEADING FOR A NEW COUNTRY

There can be no denying the fact that over the past several years the popularity of country music has exploded, and Bob Butler has experienced the changes first-hand. "When I began doing country music about 16 or 18 years ago it was a lot sleepier and slower paced. There is so much business going on in Nashville right now that it's swamped. I think country music has made leaps and bounds in

its exposure and progressed into 'unknown' markets like New York City, which only five years ago, didn't even have a country-music radio station. It's a much more accessible music to people. There are more kinds of music within the blanket term of country music than I have ever seen — from twangy, smokey-mountain bluegrass to real progressive pop kind of stuff to traditional country. It's a wide open genre and I think people are relating to the songs more than ever before." **EQ**

## LSi FIBOX REVIEW

*continued from page 116*

The rear panel looks similar to the input unit except the XLRs are male, the stacking connector is a 25-pin sub-D connector, and the switch is for disconnecting the audio ground from the chassis of the unit. Both units use substantial wall-wart power supplies along with the nonlatching connector. This format of power supply and connector can be a problem, especially when securing them in a portable rack. [LSi has revised the wall-wart supply in later production models to reduce its size and added a latching coaxial power connector.] An optional rack-mount power supply is available that also includes battery backup for critical applications.

The unit functioned flawlessly during my testing, with transparent transmission of the audio (see fig. 1) and complete freedom from artifacts and noise (the microphones were noisier than the mic preamps, and the rooms were noisier than the best mics). The gain controls did jump in level in the last 10 degrees of rotation, a problem common to many mic preamps. The unit does allow accurate level setting and the recessed controls prevent accidental adjustment. The D/A converter unit runs hot to the touch, so it should be mounted where sufficient convection cooling is available. [LSi states that the revised power supply in later models does not suffer from this problem.] The 20-bit A/D and D/A converters allow you to maintain a good safety margin before clipping without compromising noise. This feature is especially important because the gain controls will typically be out of reach at the mic preamp and not at the mixing console or recorder.

If you are plagued by electro-magnetic interference in your audio lines, ground-loop problems, or are just

looking for a good mic preamp, then you should consider the Fibox. You can buy the fiber-optic cables prebuilt if you don't want to build your own, and you will quickly learn to appreciate the reduction in cable size and weight. The phone companies have been using this stuff for about 30 years; now it's our turn. **EQ**

## YAMAHA REVIEW

*continued from page 119*

and the overall level and pan position of the external signal(s) can be altered in real time via MIDI controllers, enabling automated mixdown. The owner's manual does not specify the sample rate or bit resolution being used by the MU80 A/D, but I suspect it is 44.1 kHz / 16 bit. Certainly, the conversion is clean and results in few, if any, audible digital artifacts.

If the MU80's greatest strength is its degree of MIDI control (when used in XG mode), its greatest weakness is the absence of user RAM for the storage of edited voices or effects (there is, however, provision for sys ex data dump and there are 128 slots for the storage of user-defined Performances). I also was disappointed to find that you cannot access Performances during multitimbral operation — the two modes are mutually exclusive. And, though a degree of this is to be expected in such a compact, feature-laden unit, I found the user interface to be somewhat convoluted — it can take many hours to get a clear sense of the various button-pressing combinations required to access the many user-editable parameters. The provided documentation is adequate though somewhat skimpy and weighted towards technical details.

The MU80 provides an interesting glimpse into the future. If you're into developing commercial music files, you'll find lots of features here that will enable your productions to shine. And if you're a working musician on a budget, it's a cost-effective way to add a good sounding multitimbral tone generator and multieffects processor to your arsenal. —Howard Massey

*Howard Massey heads up On The Right Wavelength, a MIDI consulting company, as well as Workaday World Productions. He has discovered that the hex dump request for a MIDI-controlled German Shepherd is "FO WO OF F7."*



## Arboretum Systems Hyperprism



**MANUFACTURER:** Arboretum Systems, Inc., P.O. Box 470580, San Francisco, CA 94147. Tel: 415-931-7720.

**APPLICATIONS:** Effects processing software for the studio.

**SUMMARY:** Software processor that works with a Mac and Digidesign sound card to produce different types of effects.

**STRENGTHS:** Lots of different types of unique processing; easy to use; nice interface.

**WEAKNESSES:** No reverb; only two parameters can be altered.

**PRICE:** \$595

**EQ FREE LIT. #:** 146

HYPERPRISM is a very cool collection of digital audio effects for Macintosh computers and Digidesign sound cards. Version 1.5.2 adds eight new effects, MIDI control, and Hyperprism Consoles. Hyperprism requires a Mac with an FPU (but does not run on the SE/30), System 7.0 or later, at least 2 MB RAM, and a Digidesign card such as the Audiomedia, Sound Tools, or Pro Tools cards. A future release will support TDM and Pro Tools III.

The effects are of uniformly high quality. I used a Quadra 700 accelerat-

ed to 33 MHz with 20 MB of RAM and a fast 2.1 GB drive and did not encounter any problems, but results may vary with other configurations. Delay effects are processed by the Macintosh CPU while all other effects use the Digidesign DSP. As a rule, a faster Mac and hard drive is better — Arboretum recommends at least a IIfx.

### IT'S GOT THE LOOK

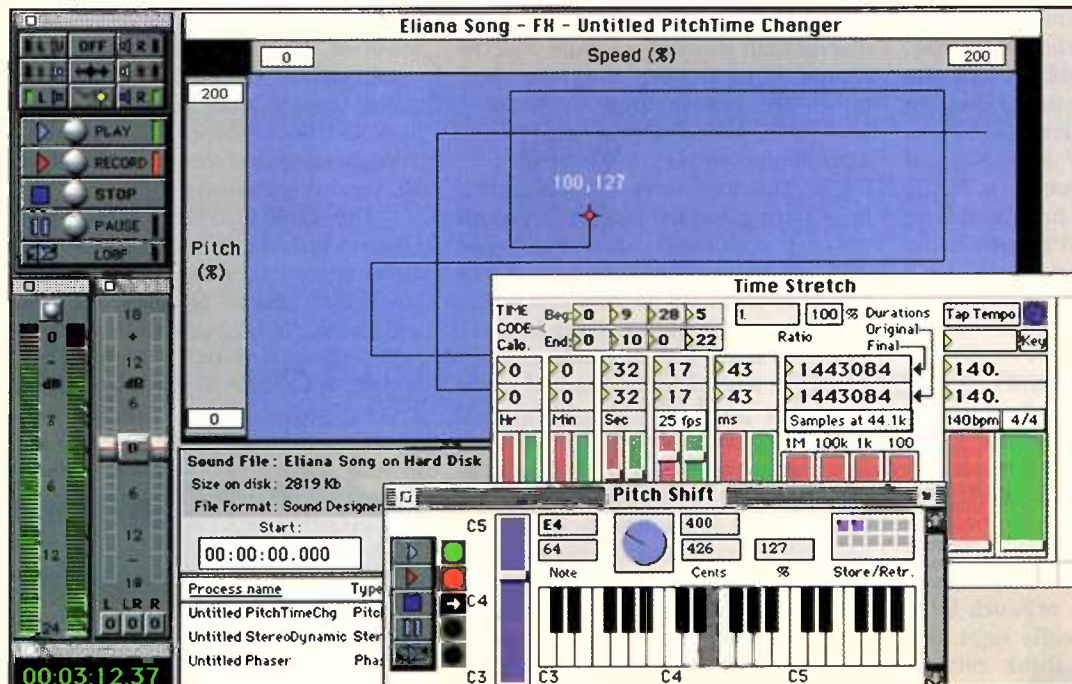
The Hyperprism interface looks and feels great. The faders have a realistic 3D look, and I love the peak-hold

meters with the green, yellow, orange, and red segments. Process parameters are adjusted on an x-y grid in the "Blue Window," which is reminiscent of Music Mouse by artist-programmer Laurie Spiegel. You can smoothly and simultaneously adjust two parameters by dragging the "tracer," or abruptly change parameters by clicking. Holding the shift key limits motion to the vertical or horizontal direction. Mouse coordinates next to the tracer give you instant feedback. You can process from any point within the sound file and specify an end point or duration. This segment can be looped to play continuously and processed/unprocessed versions can be A/B tested for comparison.

Hyperprism processes are nondestructive. Mouse movements are recorded in a Hyperprism document that is linked to a source sound file. You can create dozens of variations and then process the ones you like to new sound files in SDII and AIFF formats. This can have drawbacks, however. For example, processing a section of a song involves creating a new file and copying the processed section back into the original file. It would be nice to have the option of processing an area of the original file. Multiple passes let you layer effects upon effects, and most effects also function in "thru" mode, allowing Hyperprism to act like a stand-alone effects box.

### WORKING BLUE

Hyperprism Consoles and MIDI control offer an alterna-



**TWEAK UP:** Hyperprism's interface makes it easy to control and adjust digital audio effects.



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tive to the Blue Window, but the implementation is still in the early stages. Personally, I like the Blue Window, but I do wish that more than two parameters could be altered, or that at least there were a choice of parameters. For example, the only adjustable flange controls are modulation speed and delay time.

Of the 29 effects, ring modulator, hyper-stereo, M-S matrix, and Doppler were especially interesting.

Hyper-Stereo widens the stereo image by adjusting the balance between the mono portion and the pure stereo portion of a recording. This can also be used to isolate the pure mono or stereo parts of the signal, which is something I have had many requests to do in the past. Have you ever needed to remove vocals from a recording?

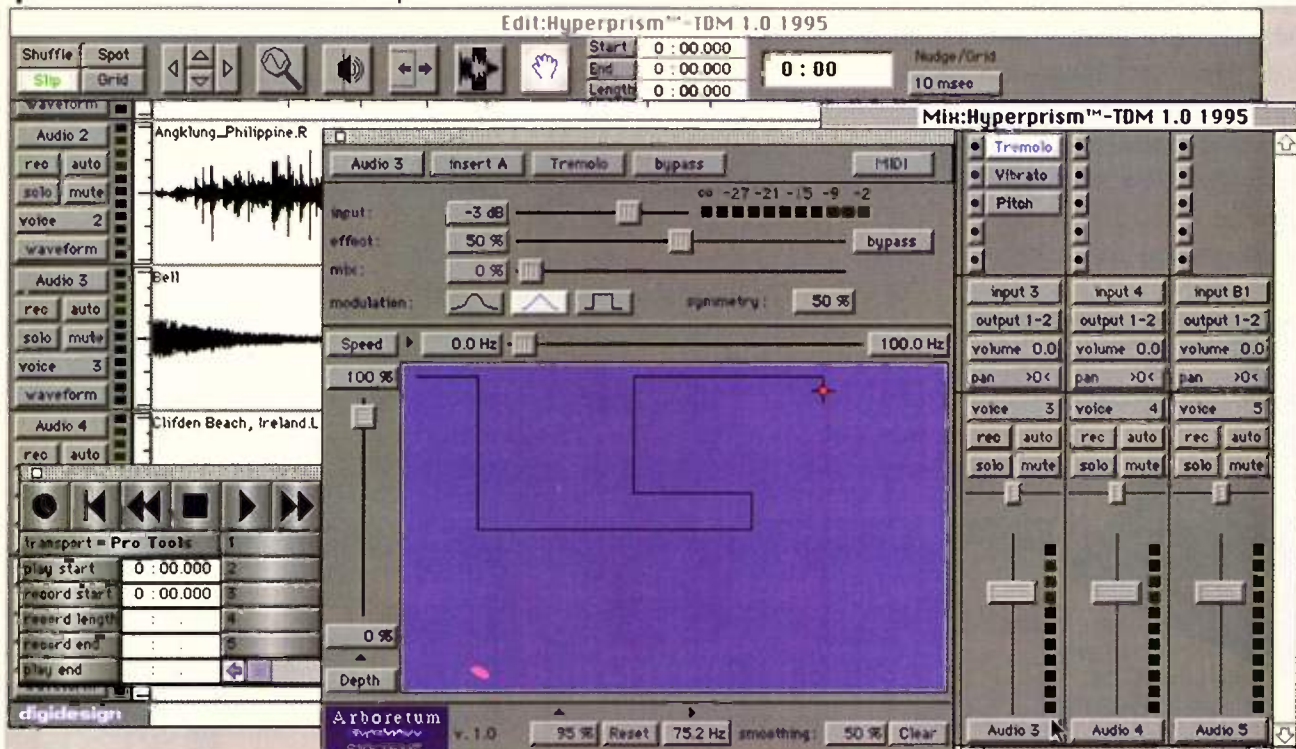
M-S Matrix decodes M-S recordings (Mid-Side or sometimes called Mono-Stereo) that traditionally required a hardware decoder. You can vary the width of the stereo image and

shift the image from left to right.

Doppler shift creates a stereo file from a mono file and pans the sound while shifting the pitch. I used this to create a helicopter fly-by from a static helicopter sound file.

I also used Hyperprism to help create an unusual soundtrack for an animated film. Richard Reeves creates his own soundtracks by drawing directly onto the optical track of the film. He originally wanted to transfer to DAT and layer sounds and create crossfades, but once he played with Hyperprism, we ended up adding ring modulation, echoes, and flanging.

Hyperprism is a very useful and fun piece of software. All your audio can stay digital and, although it does not do reverb, it does have several effects that aren't commonly available in a stand-alone effects device. If you own a Mac and a Digidesign card — and especially if you are a sound designer — then Hyperprism is an excellent alternative to buying a hardware effects processor. —Tona Ohama

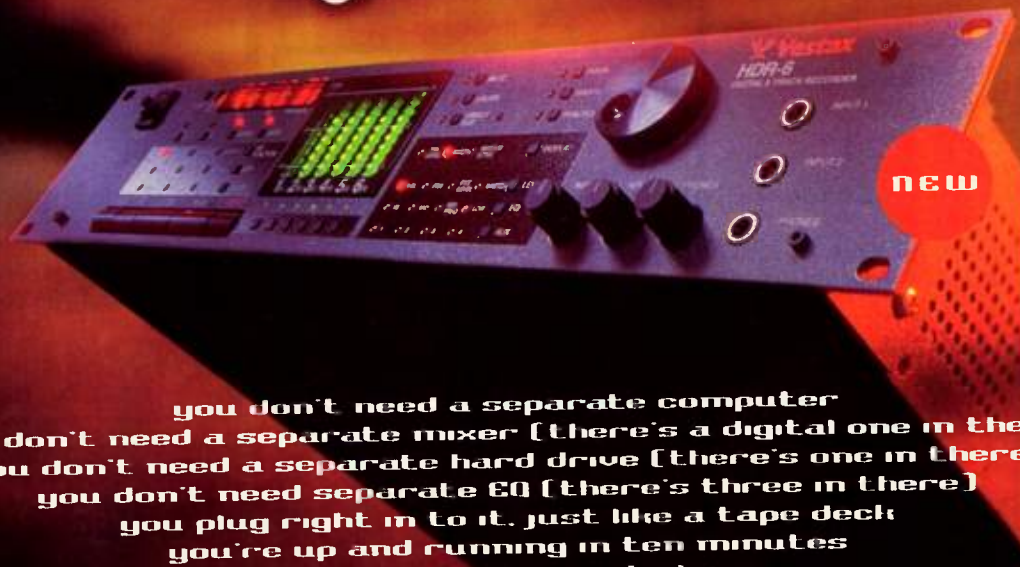


WORKING BLUE: Hyperprism's Blue Window enables you to adjust up to two parameters.



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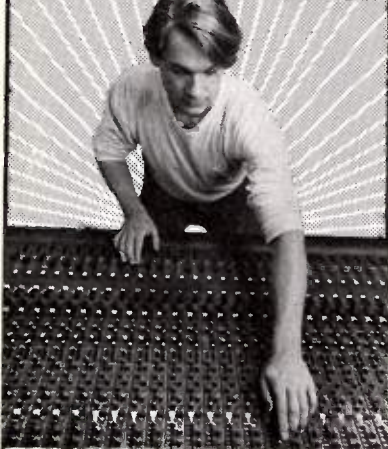
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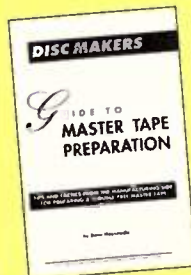
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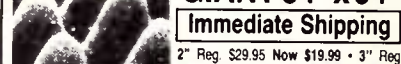
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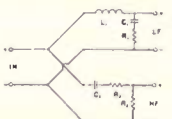
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## ACROSS THE BOARD

continued from page 138

inputs. Not only does it let the musicians hear what they want to hear, but it frees up the engineer to concentrate on the recording and not the never-ending task of mixing headphones.

A few months back *EQ* did a review of a bunch of "More Me" systems [see *EQ*, April '95]. I have been using a system called PrivateQ, made by a company called Mytek Technology, that somehow got missed in the *EQ* review. It is a great sounding system. I have used the PrivateQ system at Donald's studio in New York, Walter's studio in Hawaii, Sony studios in New York, and Javelina studios in Nashville. Now when a musician says, "Can I get more me?" I reply with, "What, are your arms broken? Just turn up knob three!"

### WATCH OUT WHO YOU DEAL WITH

Here is something that everyone but me has probably already run in to. So, you are working on your little album in your project studio. A friend of yours from out of town says that he was thinking about coming in to town to visit. Your friend comes over and you

are recording your little brains out. Your friend comes up with a couple of suggestions that help. A word change here, a chord change there, nothing spectacular, but it helps. Mostly you appreciate the "vibes" that help the sessions just because you are having a good time. Under normal circumstances, your friend would have no participation in the album project because of his minor input, but because you are a magnanimous person you offer to give him some money for his help (even though he didn't ask) and give him partial writer's credit for the input he had.

The next thing you know, your friend is calling up the record company, setting up interviews with radio stations about his involvement in your album, and his friends are telling him to watch out because everyone in the record business is out to screw everybody else (OK, so maybe this part is mostly true) and that you are going to make sure that he never sees a penny for all of his hard work helping you with your project. He then starts demanding contracts for cowriting with you and demands half of the publishing and a percentage of the artist's royalties. At this point you have to get a lawyer to draw up agreements between you and your friend over a record that you will be lucky to see

break even for the record company, let alone make any money for you. Remember, you got no advance and gave this guy money out of your own pocket for his friendly advice. So far he has made more money than you have, and you have to pay a lawyer to keep him off your back. To top it all off, every six months he bugs your lawyer for copies of the royalty statements and you get the bill for your lawyer's time.

I guess the moral of this story is don't invite friends over when you are doing anything creative, and if they do come over tell them that all of their ideas suck. They will thank you for it later.

### ERASABLE CD

I told you so. It is now official, ten companies including Philips and Sony have agreed on a format for erasable compact discs. The other companies were 3M, IBM, HP, Ricoh, Mitsubishi, Mitsumi, Matsushita, and Olympus. Players and recorders should hit the stores in the first half of 1996. I guess that's goodbye to DCC (again), MiniDisc (except they are so small and cute), and DAT machines. DATs are twice as long as a CD, but not far behind will be the HDCD with 5.5 hours of storage. Remember last month? I told you that everything you owned was obsolete. **EQ**



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**TECH TALK.** The Techniques section of the July issue pulls out all the stops with practical information about recording over those hot ISDN lines and Roger Nichols's second installment of "What Happened to My Digital Tapes?" And hear from the studio stars as Yes's Trevor Rabin examines E-mu's Emulator IV and Kevin Killen takes us behind the board with Elvis Costello and Peter Gabriel.

**SNEAK PEAK.** Get the lowdown on the new gear that will be on display at the Summer NAMM Convention.





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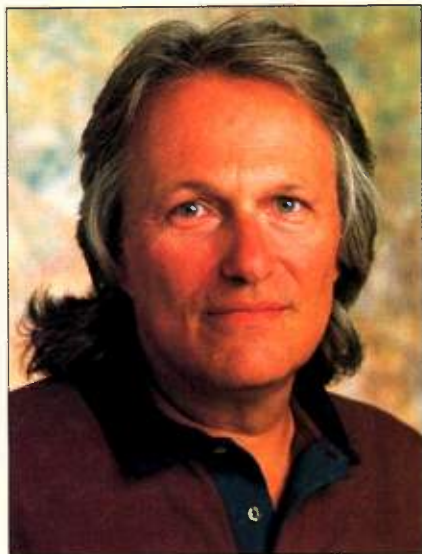
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# Back Up Your Data?



... Don't even think  
about it

BY ROGER NICHOLS

I didn't make that up, I saw it on the brochure that came from Grey Matter Response in Santa Cruz, CA. They make Mezzo Media backup software that runs in the background, making sure that all your stuff is archived. In the process of moving pianos around and flying guitar parts from Mars into tracks from Venus, I have amassed billions of megabytes of audio files. I have hundreds of samples of bass parts, thousands of kick drums, a plethora of hihats, and one digiridoo. I grab them from floppies, optical discs, SyQuest disks, DAT tapes, and even a couple of sounds I took off of my telephone answering machine (the digital one, of course). Things are starting to get lost. Sometimes I even erase samples, thinking that they are copies,

only to find out later, after I emptied the trash, that they were the originals. That "Pygmy Belly Slap" didn't work out too well as a back beat anyway.

There used to be a time when everything that was related to a project would fit on a floppy disk. If you wanted a safety copy, all you had to do was make a copy of the floppy disk. Then somebody invented the hard disk. The sole reason for this invention was to sell more floppy disks. A 5 MB hard disk took fifteen 320 k, 5 1/4-inch floppy disks to safely back up everything. You could have two sets of back up disks and alternate between them each time you archived your data. I guess floppy disk companies weren't selling enough floppy disks, so they invented bigger hard disks. Then came bigger floppy disks. Well, they were actually smaller, 3-1/2 inches, but they held more data. It started looking like it would take a hundred or more floppy disks to back up your hard disk. Next there were removable hard disks that stored more than 40 or 50 floppy disks worth of data, but hard-disk manufacturers were bound and determined to make it impossible to back up your data by making the hard disks so big that the data would not fit on anything. The war is on. EXABYTE tape, DAT backup, optical disc, Bernoulli, SyQuest, and floptical against 4 GB and 9 GB hard disks. You can't win, so the answer is give up. Don't worry about backing up your data, just don't do it. Don't save anything. If you make up your mind that if fate erases your favorite snare drum sample that you weren't supposed to use it anyway, then you should just keep one copy of everything, no backups, and forget about it. Done, next subject.

#### MORE CD-R STUFF

I just got the new release of Masterlist CD from Digidesign and used it to crank out a bunch of CDs. The current version supports most of the SCSI-based CD recorders. The biggest advantage that Masterlist CD has over the other audio CD writing packages is that you can have continuous music with CD start IDs during the music (if the recorder supports it). This is pretty much a must if you are sequencing an album from

live recordings where you would like to hear the audience reaction between tracks. Or how about a classical piece where you would like to have a start ID at the beginning of each movement. With Masterlist CD, you can crossfade between cuts or just have continuous music across CD start IDs. Some recorders require mandatory spaces between CD tracks, so Digidesign includes a list of which drives do and which drives do not require spacing.

The Mezzo guys [Grey Matter Response] also have a piece of software called Mezzo Master (DDP) that works with Masterlist CD for producing EXABYTE tapes that can be sent directly to the CD manufacturing plant. When you have all of your tunes sequenced and crossfaded in Masterlist CD, you produce an image file of the audio CD that is then written to the EXABYTE tape by Mezzo Master. After the tape is written, it is read back and verified byte for byte with the image file. A very nice piece of software.

#### MORE ME

In the past I have talked about the importance of headphone mixes on the recording process. Everyone in the studio wants a little something different in the headphone mix in order to perform at his optimum. Most studios only allow you to have two different headphone mixes going at the same time, and they are controlled from the console. If the bass player wants more floor tom echo, then the engineer at the console has to change the balance only to have the drummer complain moments later. During any given session, every musician in the other room will belt out the memorable phrase, "I need more me!"

More and more studios are changing over to some form of "More Me" headphone systems, where each musician can control his own mix on a box that has eight to twelve inputs for individual inputs. Usually what happens is that a basic mix of the whole band is sent out to a stereo input on the More Me boxes and then selected instruments are sent out to the other faders. The musician can change the level, panning, and EQ of the individual

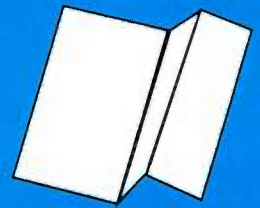
*continued on page 136*



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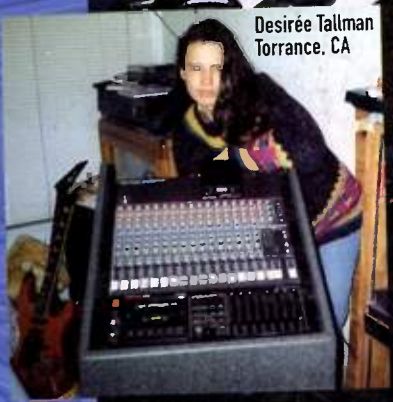
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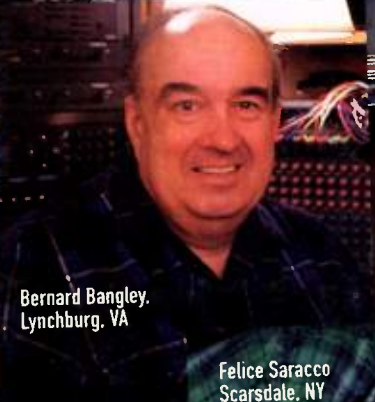
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