

# Great New **LIVE SOUND** Gear

# E

**THE PROJECT  
RECORDING &  
SOUND  
MAGAZINE**

JANUARY 1997

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PEAVEY IMPULSE SPEAKERS  
QSC POWERLIGHT AMP  
QUASIMIDI SYNTH  
ALESIS NANOVERB  
DBX PROCESSORS**

# SOUND ON STAGE

*Guitar Heroes: Joe  
Satriani, Steve Vai and  
Eric Johnson on Tour*

**AL KOOPER'S  
AMAZING  
LIVE SNARE FIX**

XXXXXXXXXXXXXXXXXXXX 3-DIGIT 500  
ED 0112336  
RDN CARLSON  
ZOOM TAPES-PRODUCTIONS  
103 TAMA ST  
BOONE IA 50036-3616

**IN REVIEW:  
OTARI STATUS CONSOLE  
NICHE AUTOMATION SYSTEM  
TASCAM M1600 CONSOLE**

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CIRCLE 02 ON FREE INFO CARD



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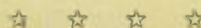
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EDDIE KRAMER

- |              |              |
|--------------|--------------|
| The Beatles  | Kiss         |
| Blind Melon  | Led Zeppelin |
| David Bowie  | Santana      |
| Joe Cocker   | Spin Doctors |
| Buddy Guy    | Traffic      |
| Jimi Hendrix | Woodstock    |

CHRIS KIMSEY

- |                |                  |
|----------------|------------------|
| Bad Company    | Johnny Hallyday  |
| The Chieftains | Humble Pie       |
| Jimmy Cliff    | INXS             |
| The Cult       | Psychedelic Furs |
| Duran Duran    | Rolling Stones   |
| ELP            | Ten Years After  |

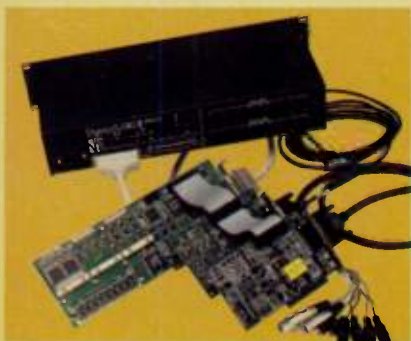
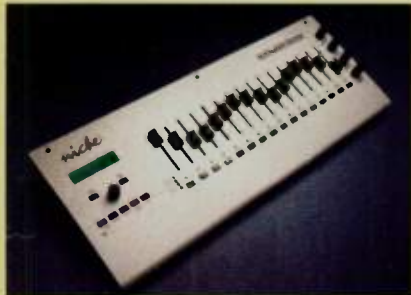




# EQ



PROJECT RECORDING  
& SOUND TECHNIQUES  
VOLUME 8, ISSUE 1  
JANUARY 1997



**ON THE COVER:** Joe Satriani jams on-stage with the G3 Tour. Photo by Julian Jaime.

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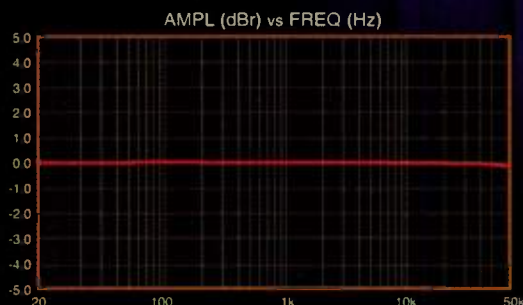


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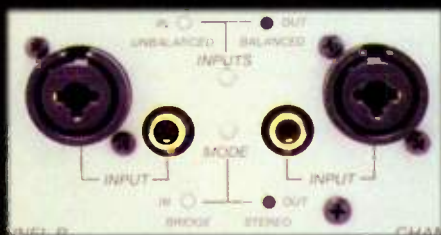


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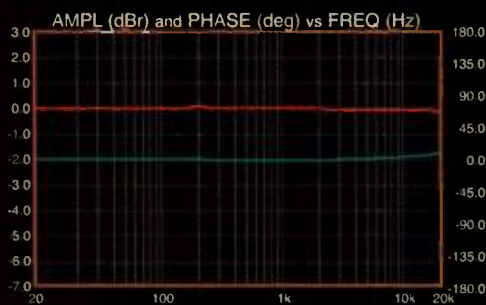
An all discrete MOSFET design provides a ruler-flat frequency response from sub-sonic to 50 kHz which is enhanced by the gold input and output connections.



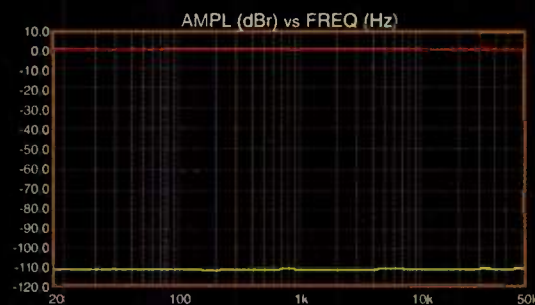
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CIRCLE 61 ON FREE INFO CARD





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## The Well-Rounded Engineer

I'LL NEVER FORGET the very first show I mixed for a major band. It was Blue Öyster Cult appearing at a race track in Indianapolis, IN. In case I wasn't already worried enough about getting the job done, the temperature at 4:00 PM was a cool 97 degrees, the house was packed and, by the way, there was no chance for a soundcheck. Imagine my terrified little butt sitting behind a Yamaha PM3000 for the first time (which I could barely rest my hands on because the metal was so hot), mixing the show unrehearsed while BÖC's road manager, (the beloved) Rick Downey, screamed cues at me from behind his lighting board. Halfway through the show, I lost the entire left side of the PA and never got it back. Needless to say, I was not a happy camper when that show was finished.

But I survived and learned more in that one show than I probably learned in the prior six months. Sure, I had done live sound before, but as a freelance engineer it seemed that at that time, I was doing more work in the studio either engineering sessions or wiring control rooms and studios. Having already worked as a BÖC stage tech (and occasional monitor mixer) I had always been hoping that at some point George Geranios (the band's longtime house engineer) would be otherwise occupied so that I could get the call. Why? Because I knew I could do it. I knew that the experience I was storing in the far recesses of the left half of my brain (or is it the right half?) would help me be part of a very cool live experience. And the key word in that last sentence is "live." Just as is the case for the band, there is no second take for the engineer. You do it once per night and when it's over, if you've screwed up, hopefully you figure out why.

The finding out why part is what makes an engineer's skills truly progress. You can mix a band in a club and try that really cool studio technique for miking the bottom of the snare drum, but you had better remember that the drummer's monitor is probably raging and, at the very least, it's going to make the snares buzz constantly. On the other hand, some people mic a ride cymbal in the studio, so why not put an extra '57 out on stage in addition to the regular overheads? My point is that any type of audio work you do adds to what I call the "engineer's bag of tricks." If you want to pay the bills, you've got to have the skills — your bag of tricks had better be full. This way you can get the studio design gig or the keyboard tech gig or the monitor engineer gig or whatever. Working at any of those positions ultimately complements the others, making you a more well-rounded engineer.

It is with that philosophy in mind that *EQ* presents to you another start-of-year live-sound special. If you are reading this magazine in the first place, you are looking to widen your horizons and get a pulse on what other people are doing. If you've been in that studio fishbowl, get out and do some club gigs. No soundcheck? Ha! That's almost a given nowadays. The rush comes when the band hits the stage and the first song sounds great *without* the check. You want to feel adrenaline? Believe me, this is very close to being a band member. Likewise if you are primarily a "live guy" (or gal) — dive into some studio sessions where you're responsible for doing five different headphone mixes while recording to multitrack and keeping the producer happy with the sound in the control room. It really puts a new perspective on mixing monitors, and I guarantee you will learn something.

—Steve "Woody" La Cerra



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**CIRCLE 85 ON FREE INFO CARD**



## HEARD ON THE WEB

I loved the EQ Online Buyer's Guide [www.eqmag.com]. It really helped me decide how to start my home studio. My only wish is that you would put in more products and try to get the companies to include more prices or predicted prices. The real reason I'm writing, however, is that I am looking for a job. I'm educated in audio through O.I.A.R.T (also on the net) and I really love what I do. The problem is that because pro audio equipment has become so inexpensive, smaller studios can compete with the big boys, putting guys like me in a bind. Large studios are not hiring staff engineers, and I don't have the money to start my own studio. I may have a chance with the Canadian Broadcasting Corp., but they, too, are faced with cuts!

So do me a favor, will ya? Raise the prices in the Buyer's Guide 1000 times. This may protect staff engineers like no union ever would. Imagine an ADAT at \$40,000 — I'd have a job for sure!!!

*Mike Pomerleau  
via EQ Web Site*

## MAKING NOISE

I have just read an ad from a well-known and, up until this moment, respected microphone manufacturer claiming that their condenser microphone develops absolutely no self-noise. This is either total marketing hype or just plain ignorance. Until recently, technology virtually eliminated electronic mixing and processing noise as the dominant noise source, microphone self-noise was fairly well masked. Now, with quieter designs, stories are being circulated throughout the industry about new, "noiseless" microphones. We believe this is another case of attempting to differentiate "me-too" products in a crowded marketplace. Using technical jargon, while ignoring the actual technical facts is misleading, causes confusion, and ultimately diminishes the attributes inherent in well-engineered and honestly presented microphones.

So let's set the record straight. Microphones have some level of self-noise unless they are cooled to and measured at a temperature of absolute zero. This applies to both condenser and dynamic microphones. No matter what the ads and articles say, microphones have resistances that generate self-noise. Microphone self-noise is comprised of Brownian motion — the noise on the diaphragm caused by random

impacts of air molecules; Johnson noise — the noise generated by any conductor or semiconductor; and, finally, 1/f noise — the noise generated by semi-conductors. All microphones have a minimum output level where the ambient sound pressure level equals the internal noise in the microphone's circuitry. This self-noise is an indication of the minimum output level of the mic, and therefore may also be used as an in-

So what was the first article I read? Al Kooper trashing Nashville. Quotes like "Nayeshveal," "Shville" and "not Music City, Country Music City," seem like he is going out of his way to be insulting. Sure, he does mention many good things about Nashville, but even they are presented in a negative light. He will list something like he is going to present a positive image then says, "but," and goes negative. He talks about the "curse," but never mentions artists like Amy

The screenshot shows a Netscape browser window titled "Welcome to EQ Magazine". The address bar shows "http://www.eqmag.com/". The main content area features the EQ logo, a "Welcome Net Traveler" heading, and a sub-heading "To EQ's Recording and Sound Buyer's Guide". Below this is a navigation menu with buttons for "Search", "Categories", "Companies", "Industry Info", "Contact Us", and "Subscribe". The main text area contains a welcome message and a description of the interactive buying resource. To the right is a thumbnail image of the print edition cover, titled "The cover of our print edition".

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dication of the microphone's quality.

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*Bill Spence  
Senior Design Engineer  
Electro-Voice*

## NO NASH BASHING

When I first saw that *EQ* was doing an issue on the new Nashville skyline, I was pleased that we were getting some attention. Too many times the media — be it TV, movies or in print — project the barefoot hayseed image and not the real Nashville. As a native born and raised in Nashville, I was looking forward to *EQ* giving us a fair shake.

Grant and Michael W. Smith who have achieved success while based in Nashville or the country artists who have crossed over.

He never talks about Nashville being Christian Music City. He talks about how the city fathers are ruining the town by deciding to "gentrify" downtown, but in truth it is a brilliant move. They are bringing money into a rundown area of downtown and drawing the tourists who still come downtown to see the old Ryman Auditorium and Tootsie's. It is downtown that will be affected, not Music Row (the Row is several miles away). The Arena will give us a large hall where we could do large concerts, conventions, and maybe even the Grammy awards.

I could go on, but the bottom line is this: in one breath he talks about how much he likes it here because it is different than where he came from and then in the next complains because it's not like somewhere else. It sounds like he likes Nashville but is ashamed to admit it, so he has to find ways to be critical.



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*"The Event 20/20s turned out to be damned fine monitors."*—PAUL WHITE, SOUND ON SOUND

*"If the 20/20 monitors are any indication of what we can expect from Event Electronics, this is a company worth keeping a close eye on."*—LOREN ALLDRIN, PRO AUDIO REVIEW

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## LETTERS TO EQ

After reading that article I was not in a good frame of mind for the rest of the issue, but was quite pleased to see the other articles were a more honest picture of Nashville and the people I know. Thank you for the look at Nashville's new skyline, just next time we can do without Mr. Kooper's version.

*Don Roberts  
Goodlettsville, TN*

## DIFFERENT DRUM

It has come to our attention that there is some confusion regarding the proper placement and beyerdynamic M88 microphone with regards to drum miking. The M88 was originally designed as an extremely high-quality microphone. It features a very high degree of sensitivity to that end. In fact, the diaphragm is only a minute 10 microns thick. Since its inception, audio engineers have experimented with the M88 in a variety of applications — including sax and kick drum. Its sensitivity being the quality that makes it sound exceptional.

In the kick drum, a certain degree of care needs to be exercised both to get the best audio quality and to ensure a long and fruitful audio life. Most pro audio engineers are aware that the low end in a kick drum does not develop until some distance from the actual skin or drum head. Typically, this will be 12-to-18 inches away from the skin in a bass drum. The mic can be parallel to the skin or angled in.

With less sensitive mics, it may be necessary to compromise to get an element of click or beater sound. This often involves putting the mic close to the head to get the beater sound and then winding the low end up on the console to make up for the lack of lows.

Due to its sensitivity, this approach is neither needed nor recommended with the M88. For most applications, position the mic as recommended above, and, if necessary, perhaps take a little 200–250 Hz out and add either a little 2–3 k for click or 5–6 k for presence. Happy miking.

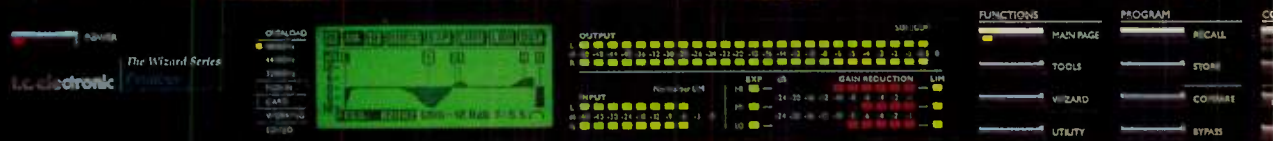
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beyerdynamic*

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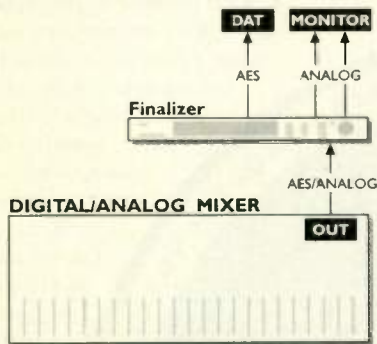
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# EQ&A

## MAKE THE SWITCH

**Q** I am looking for details for converting a Technics model SV-DA10 DAT from recording at 48 kHz to recording at 44.1 kHz. I'm not sure of the issue in question, but if you could help me find the information I would be greatly appreciative.

Hank Lueck  
via the Internet

**A** The Technics SV-DA10 is a consumer DAT machine. Its original function was to record and playback at 48 kHz only. This was to avoid any conflict with the record industry's desires (however misguided...) for consumers to be unable to make digital copies of CDs. Panasonic adheres to the guidelines, which differentiate between consumer and industrial DAT recorders, out of respect for those concerns of the record industry. Panasonic, therefore, does not offer options that would cause a product to cross those lines, which would include the ability to record digitally at 44.1 kHz. You may want to communicate with a company we found in northern New Jersey that can perform this modification: NXT Generation, 249 Kennedy Road, Greendell, NJ 07839. Tel: 201-579-4849.

You may also want to contact EQ's maintenance guru, Mr. Eddie Ciletti, for additional information. Call him 212-529-8225 or e-mail him at: edaudio@interport.net. Good luck.

Hector G. La Torre  
Executive Director  
EQ Magazine

## CURRENT TRENDS

**Q** Is there an alternate method you could suggest to "adjust the record current" as delineated in the TEAC Service Manual? I do not have the record current kit from TEAC or Tektronics current transformer for my 'scope.

Thanks for Eddie Ciletti's article in the October '96 EQ on DA-88's. I will follow the advice to the letter. Looking forward to more maintenance tips on DA-88's, especially those hidden features.

Chris Babin  
via the Internet

**A** There is no easy way to measure record current without the kit and transformer. To be honest, I am not even sure it matters so much as just having the "correct" tape. For example, I just recently tested Sony's DTRS-approved DARS-xxxMP (where xxx is the length in minutes). Its playback response yields a superior tracking signal and high data output for low error

rates. (The ATF signal is between 100 kHz and 200 kHz, while pilot and data are 3 MHz and 6 MHz, respectively.)

It would be much easier if it were possible to "read-after-write" to confirm the affect bias has on recording. What I did before acquiring the transformer was to record my voice detailing the signal measured with a voltage probe (on the record PCB) while also making note of the Absolute time. (Record VOLTAGE test points seem to be optional depending on the machine's vintage.)

I found the transformer (without cable) for \$200 at: North Star Trading, Inc., Mr. Michael Naim, 5 Eldridge Drive, East Brunswick, NJ 08816. Tel: 800-535-8014/908-254-7049. E-mail: HAJA49B@prodigy.com.

Contact them for additional information.

Eddie Ciletti  
Manhattan Sound Technicians  
NYC, New York

## THAT SYNC'ING FEELING

**Q** I am about to purchase a Yamaha 02R for my project studio in Austin, Texas. I plan to use three TASCAM digital 8-tracks (24 tracks total), which I need to sync to the 02R and to my PC running Cakewalk Pro Audio. Would you recommend three DA-88's sync'd to SMPTE; one DA-88 and two DA-38's in a master-slave configuration sync'd to SMPTE; or three DA-38's sync'd to the 02R via an MMC-38? What would be the advantages of each configuration? I do not need to sync to video.

Steve  
via the Internet

**A** When interfacing the TASCAM DA-88/38 digital recorders with the Yamaha 02R digital mixing console, you must instruct the 02R to look for word clock. In a three-TASCAM machine configuration, the easiest

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# record



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option for word clock is to have the 02R sync to TDIF (TASCAM Digital Interface) at Slot 1, Channels 1-2.

For timecode, there are also several options, and this is somewhat dependent on how you intend to control the TASCAM recorders. If your intention is to have Cakewalk control transport and track arming functions via MMC (MIDI Machine Control), I would recommend using three DA-38's with an MMC-38 MIDI Machine Control Interface. Depending upon the audio card you are using in your PC, timecode could be derived in the form of MTC (MIDI timecode) from the MMC-38, while word clock could come from the 02R's Word Clock Out port. As the MMC-38 also has an LTC (Longitudinal timecode) output, the 02R would take its timecode feed from this jack.

If you intend to use an RC-848 remote controller to control the TASCAM recorders, I would recommend a DA-88 (with the optional SY-88 sync card installed) as the system master while you lock two DA-38's to the DA-88. In this configuration, the RC-848 will control all transport and track arming functions. The 02R will continue to derive its word clock via TDIF at Slot 1 while the PC would take word clock from the 02R as described earlier. For timecode, the signal from the SY-88's Timecode Out jack could be "split" and fed to both the 02R and the PC, or you could send timecode to the 02R while feeding MTC to the PC or vice versa.

[Note: Yamaha's product manager, Peter Chaikin, adds: "The 02R will interface with any combination of TASCAM DA-88 and DA-38 recorders. Please feel free to call Yamaha Customer Support at 714-522-9000 for additional advice regarding configuration of your 02R DA-88/38 system."]

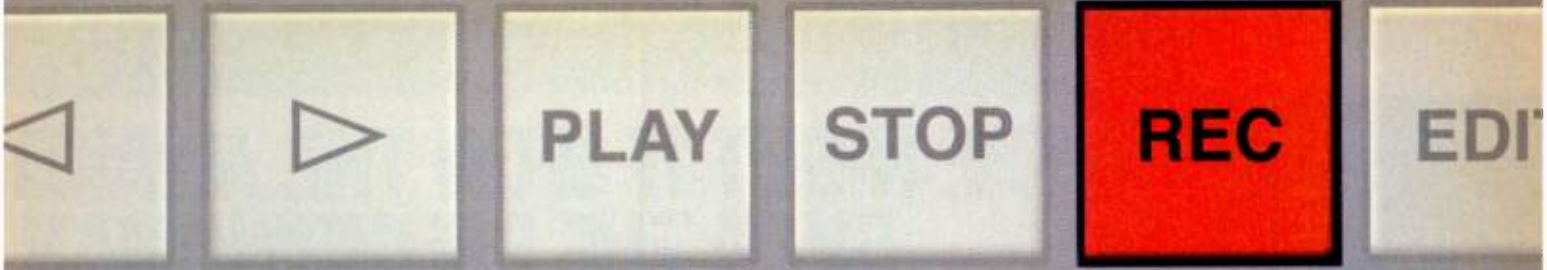
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★ **PHANTOM POWER** globally switchable and available on every XLR,

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mixer, and that's why the SR24•4 and SR32•4 come with beefy, built-in power supplies more than capable of handling the SR Series mixer's needs. This all translates into astonishingly low noise levels on tape or in your monitors.

★ **MONO MIC/LINE CHANNEL STRIPS.** 28 on the SR32•4, 20 on the SR24•4.

★ **STEREO LINE CHANNEL STRIPS.** 2 on both the SR32•4 and SR24•4

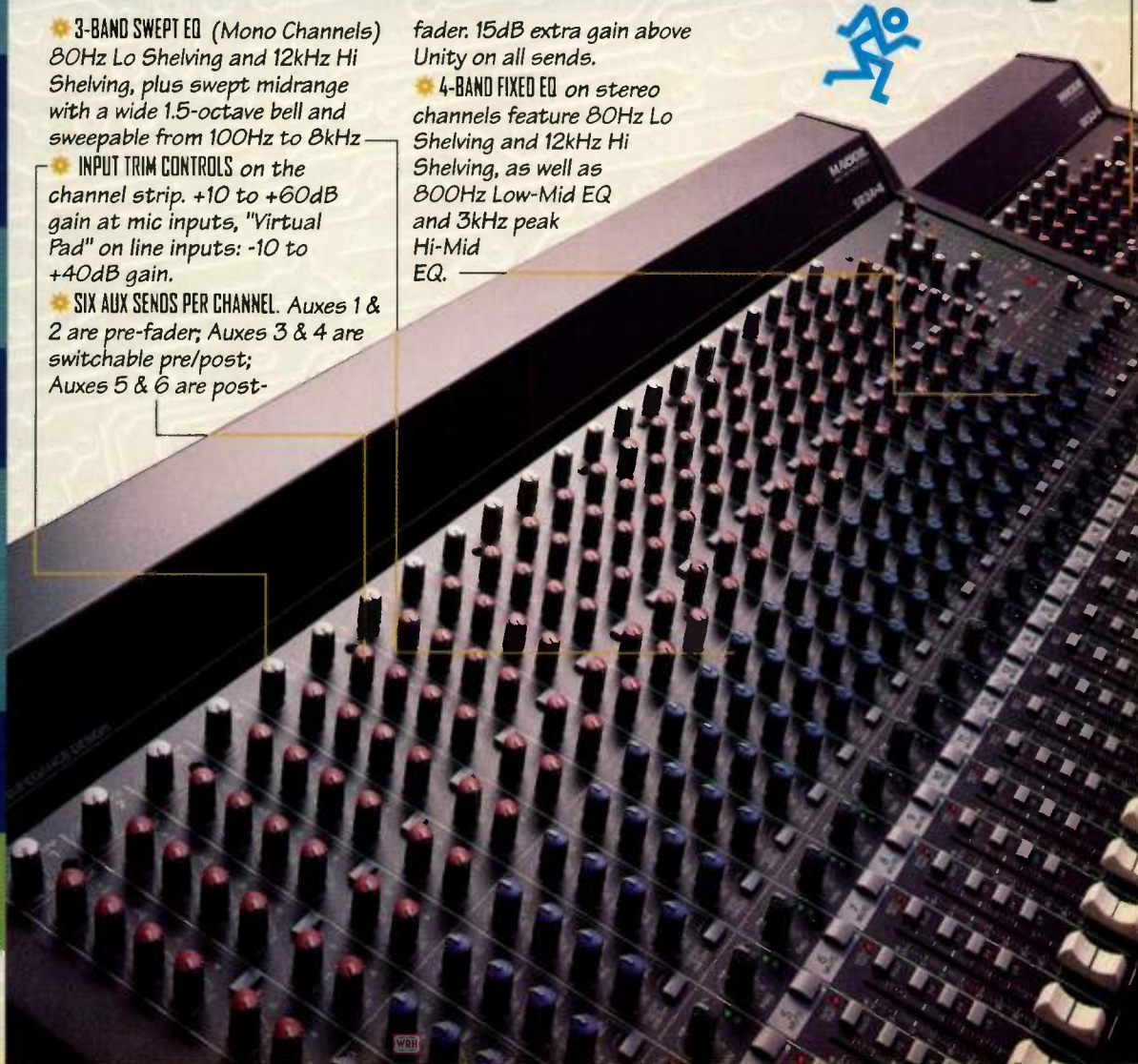
★ **3-BAND SWEPT EQ (Mono Channels)** 80Hz Lo Shelving and 12kHz Hi Shelving, plus swept midrange with a wide 1.5-octave bell and sweepable from 100Hz to 8kHz

★ **INPUT TRIM CONTROLS** on the channel strip. +10 to +60dB gain at mic inputs, "Virtual Pad" on line inputs: -10 to +40dB gain.

★ **SIX AUX SENDS PER CHANNEL.** Auxes 1 & 2 are pre-fader; Auxes 3 & 4 are switchable pre/post; Auxes 5 & 6 are post-

fader. 15dB extra gain above Unity on all sends.

★ **4-BAND FIXED EQ** on stereo channels feature 80Hz Lo Shelving and 12kHz Hi Shelving, as well as 800Hz Low-Mid EQ and 3kHz peak Hi-Mid EQ.





# FOR MOST INNOVATIVE MIXER OF THE YEAR, WAS USING A MACKIE DESIGNS SR24-4.



- ★ Made in Woodinville, WA, USA.
- ★ STEREO AUX RETURNS with global solo. Aux Return 4 can also be assigned to subs 1-2 or 3-4.
- ★ 60mm LOG-TAPER FADERS deliver smooth, accurate gain control throughout their travel. Mackie's exclusive design features a new ultra-long-wearing wiper material derived from automotive sensor technology and tight, zero-memory lip seals to prevent contamination.

★ 6 AUX SEND MASTERS each with individual solo switches. Aux Sends 1 & 2 are pre-fader, great for monitor sends in live mixing. Aux Sends 5 & 6 are post-fader, which are helpful during studio mixdown. Aux Sends 3 & 4 are switchable, so you can have as many as 4 aux sends pre- or post fader on any channel. Talk about flexible.

- ★ EFX RETURN TO MONITOR level controls for Aux Sends 1 & 2.
- ★ TAPE RETURN level control.



- ★ TAPE RETURN TO MAIN MIX not only routes Tape Returns to Main L/R outputs, it also disables all other inputs to mains. That way you can play a CD/tape between sets without messing up your channel and sub settings.
- ★ TAPE RETURN TO CONTROL ROOM/PHONES & Control Room/Phones level control, to monitor and control the level going to your 2-track recorder (or to the two sets of Phones you can plug in via jacks on the back).

★ SOLO SECTION WITH AFL/PFL with level control, global AFL/PFL switch, and separate aux and sub out LED indicators. PFL (Pre-Fade Listen) allows you to listen to a signal before it hits the faders, like when trying to cue up a tape. AFL (After Fade Listen, or Solo In-Place) lets you effectively adjust a channel's place in the stereo horizon.

- ★ TALKBACK SECTION with level control, LED, separate Main Mix & Aux 1-2 assign switches. XLR mic preamp input on console back panel.
- ★ LOW CUT FILTER helps eliminate mic thumps, wind noise, etc. by inserting an 18dB/octave high-pass (low cut) filter at 75Hz. That way you can use Lo Shelving EQ on the sounds that matter, instead of wasting it on noises you don't want in your mix.
- ★ -20dB SIGNAL PRESENT & OL LEDs on all channels.
- ★ AFL/PFL SOLO with LED indicator.
- ★ BUS ASSIGN switches.



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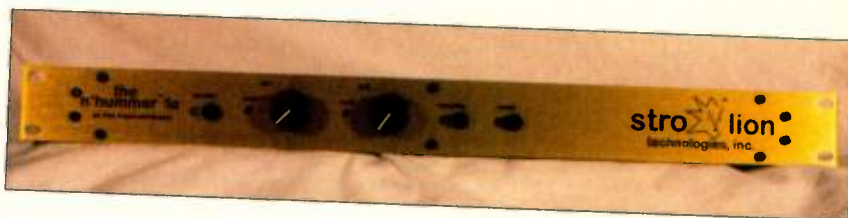




# EQ PRODUCT VIEWS

## HUM ZINGER

**D**esigned to be effective against all means of hum pickup, StroLion Technologies, Inc.'s N'Hummer 1A AC line noise eliminator is a unique solution to defeating AC hum and its harmonics in audio lines. The N'Hummer 1A delivers a clean output signal without added dynamic or phase distortion common to traditional noise gates, comb filters, and transformer solutions. The N'Hummer is available from StroLion for \$249.95. For more details contact StroLion Technologies, Inc., P.O. Box 300, Litchfield, CT 06759. Tel: 800-567-0881. Circle EQ free lit. #101.



## FEELING BLUE?

**F**eaturing +48 V phantom power and 20 dB pad and phase invert functions, dbx Professional Product's 786 solid-state mic preamp features a "super low Z" setting that optimizes the preamp's performance for microphones with very low impedance. With Coarse and Fine Gain control switches, the dbx 786 utilizes peak-program VU meters with adjustable reference levels to monitor levels. The dbx 786's signal path consists of a transformer-coupled, discrete-design input stage that utilizes the proprietary dbx M8 mic preamp module. The combination of "Spectrum" and "Detail" controls allow the user to fine tune high-frequency EQ adjustments. Two output options are available for the 786: an analog card that parallels one extra high drive output per channel, and a digital



output per channel, and a digital Type IV Conversion System card that provides proprietary analog-to-digital conversion for both channels with both AES/EBU and S/PDIF outputs. For more information, contact dbx Professional Products, 8760 South Sandy Parkway, Sandy, UT 84070. Tel: 801-568-7660. Circle EQ free lit. #102.

## MOM ALWAYS WANTED AN MD IN THE FAMILY

**D**enon's DN-M1050R MiniDisc recorder and player was designed and engineered for both recording and broadcast production studio environments.



Some of the advanced editing functions offered by the DN-M1050R in-

clude Divide (smallest edited unit is one frame, or 11.6 msec), Erase Track/Disc, Combine, Move, and Track/Disc Name (up to 255 characters can be used for each name). The DN-M1050R can also utilize an IBM-compatible keyboard to perform playback, recording, program input, and editing, as well as other functions. Denon will soon offer several additional options, including an FS Convertor I/O kit for compatibility with 32, 44.1 and 48 kHz digital sampling rates, as well as a SMPTE Kit that will enable the DN-M1050R to support video sync/word sync and Sony Serial Protocol. For more information, contact Denon Electronics, 222 New Road, Parsippany, NJ 07054. Tel: 201-575-7810. Circle EQ free lit. #103.

## VOCALS IN A BOX

**U**tilizing I.V.L. Technologies' patented vocal pitch-shifting technology, DigiTech's Vocalist Workstation is capable of producing up to five-part harmonies from a single vocal input. With the unit's Gender Bender mode, you can apply male or female tonalities to the harmonies to create the illusion of an assorted group of background vocalists. The Vocalist Workstation also offers pitch correction features as well as two separate reverbs. The Vocalist Workstation comes equipped with 50 factory presets, as well as memory for 50 custom, user-defined presets. The rear panel of the processor features an XLR mic input and TRS 1/4-inch line input (with input sensitivity switchable between +4 dBu and -10 dBv), MIDI in, out, and thru jacks, and TRS 1/4-inch balanced outputs and a 1/4-inch jack for stereo headphones. For more information, contact DigiTech at 8760 S. Sandy Parkway, Sandy, UT 84070. Tel: 801-566-8800. Circle EQ free lit. #104.







## THE DOUBLE WHAMMY

**A**udio-Technica is now offering two of its popular 40 Series microphones in stereo kits for studio and live stereo mixing applications. The AT4050/SK and AT4033/SK are transformerless, large-diaphragm studio capacitor microphones designed to provide a combination of warm, transparent sound and high SPL capability. Each stereo kit comes with two AT8441 shock mounts and is housed in a protective aluminum flight case. The AT4050 is a multipattern studio microphone that uses dual gold-plated, aged-capacitor elements for extended frequency response and can be switched for cardioid, omnidirectional,

or figure-eight operation. The cardioid AT4033 also utilizes a gold-plated, aged-diaphragm capacitor element with an interior baffle to increase signal-to-noise ratio of the mic. Both models feature integral, switchable 80 Hz high-pass filters for low-end roll-off and 10 dB pads. For more details, contact Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, OH 44224. Tel: 330-686-2600. Circle EQ free lit. #105.

## THE BEST OF BOTH WORLDS

**D**emeter Amplification's H series utilizes innovative tube circuitry for the amplification functions and the latest in solid-state technology for the driver functions. All H series units use metal-film resistors, high-quality film capacitors, custom toroidal power transformers, and are housed in an aluminum and steel single space-rack-mount case. All the units feature fully regulated power supplies that supply 200 V to the tubes and  $\pm 18$  V for the solid-state components for an expanded headroom of up to +28 dB output into 600 ohms. The series includes: The HM-1 2-channel mic preamp, which utilizes Jensen transformers and the H series tube amplification circuitry; the EQ-1, which is a 2-channel 3-band parametric EQ linkable to a 6-band 1-channel EQ with variable Q, frequency,



and 12 dB of cut or boost on each band; and the HC-1 mono compressor, which utilizes the H tube preamp with a classic photo cell compressor section. The HM-1 carries a retail price of \$1249, the HC-1 \$1049, and the EQ1-1 retails for \$1300. For more information, contact Demeter Amplification, 2912 Colorado Ave., #204, Santa Monica, CA 90404. Tel: 310-829-4383. Circle EQ free lit. #107.

## HEDD'S UP

**L**ooking to add some analog character to that digital signal? Crane Song Ltd.'s HEDD (Harmonically Enhanced Digital Device) digital signal processor was designed to give any user who works with digital gear the ability to sound "less digital and more analog." The unit's front-panel controls allow the user to select input source, sample rate, and continuously variable triode and pentode sounds. The HEDD can act as an effects processor or as a separate A/D or D/A converter with the sound process applied to either of the two built-in converters. The unit features transformerless balanced analog inputs and outputs, transformer isolated digital inputs and outputs, and uses separate power transformers and supplies for the analog and digital sections. The HEDD features a list price of \$2400. For more details, contact Crane Song Ltd., 2117 East Fifth Street, Superior, WI 54880. Tel: 715-398-3627. Circle EQ free lit. #108.



## TOYS STORY

**T**he 16MX2 from Audio Toys, Inc. (ATI), is a single rack space mixer, combined with eight individual mic preamps, each with a main and auxiliary output that can simultaneously directly feed the line level inputs of a digital multitrack recorder, as well as an additional audio device. The 16MX2's internal jumpers allow the user to reconfigure the channel signal path in a number of different ways — the standard configuration gives each channel a main output and an aux output with level control. Channels can also be assigned to a stereo MX bus with level and pan. Each preamp features a 41-position detented trim control, aux level control, and mix level pot. For more details, contact ATI (Audio Toys, Inc.) 9017-C Mendenhall Court, Columbia, MD 21045. Tel: 410-381-7879. Circle EQ free lit. #106.



# EQ

## PRODUCT VIEWS

### THE BIG SQUEEZE

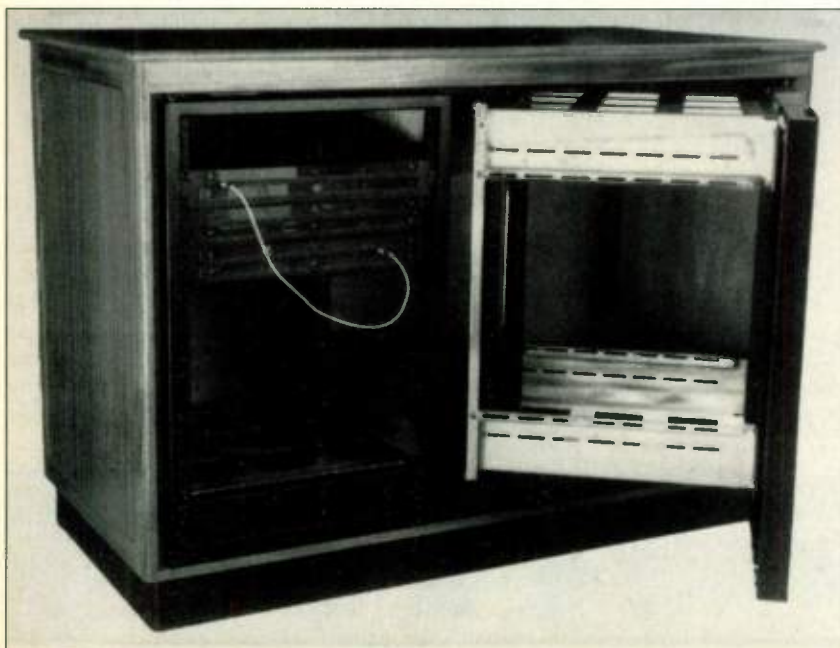


**T**he Yamaha GC2020C compressor/limiter offers precise compression and limiting

parameters, as well as an independent expander gate feature that helps to suppress any unwanted hiss or noise. The unit's External Trigger function and sidechain in/out jacks allow both compressor/limiter channels to be triggered by external signals. The GC2020C also allows you to feed the signal from one channel to trigger the other channel to create a ducking effect. The unit also offers a Stereo Link function, or 2-channel mono operation is also possible. The suggested retail price of the GC2020C compressor/limiter is \$469. For more details, contact Yamaha Corporation of America, Audio, Guitar, and Synthesizer Division, Professional Audio Products Department, P.O. Box 6600, Buena Park, CA 90622. Tel: 714-522-9011. Circle EQ free lit. #109.

### UR IN LUCK

**A**Dgear and George Massenburg Labs recently introduced the Over Quality UR-76S stereo compressor limiter. Modeled after the UREI 1176 mono compressor (which is no longer in production), the UR-76S's basic operation and panel layout emulates the UREI with the addition of an input level meter switch. The S/N ratio of the UR-76S — <85 dB (22 Hz–22 kHz BPF) — is greater than that of the original design. The unit's front panel offers input and output controls as well as attack [150  $\mu$  sec–2m sec (REL: F/90%)] and release time [130  $\mu$  sec–1.6 sec (ATK: F/63%)] controls. For more details, contact George Massenburg Labs, 7821 Burnet Avenue, Van Nuys, CA 91405. Tel: 818-781-1022. Circle EQ free lit. #110.



### ...IF IT AIN'T GOT THAT SWING

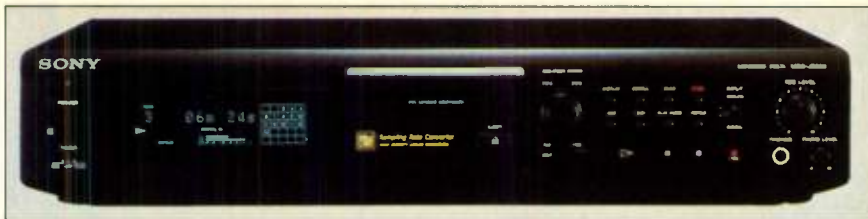
**W**ith Signal Transport's introduction of Swing Racks, the problem of accessing the rear panels of your rack equipment has been eliminated. The Swing Rack frame unlatches and the entire rack pivots out into the room for easy rear-panel access. Each Swing Rack Kit consists of a welded tubular steel face with rack rails, top and bottom pivot strike plates, a cable tie panel, and a reversible swing spacer panel to allow equipment clearance when the rack swings out. Equipment depths of up to 22 inches are accommodated. The Swing Racks are available in either single or double configurations, and in heights of 45 RU, 15 RU, and 12 RU. Signal Transport also offers optional Rear Frame Kits for each size that include rear rack rails, cable tie bars, and mounting for power strips. For further information, contact Signal Transport, 3210 Pierce Street, Richmond, CA 94804. Tel: 510-528-6039. Circle EQ free lit. #111.



## MAKE MINE MINI

**S**ony's MDS-JE500 MiniDisc recorder offers a sample-rate converter for digital-to-digital recordings from DAT that automatically adjusts 48 kHz digital audio sampling rates to the 44.1 kHz sampling rate of a MiniDisc.

Sony's one-bit pulse analog-to-digital converter also ensures accurate recording from analog sources. The unit also offers a jog dial for split-second track access, three play modes — Continue, Shuffle, and Program — 25-track programming, and a Text Entry feature that lets users customize recordable MiniDiscs with up to 1700 characters per disc. The MDS-JE500 also features powerful editing capabilities, a headphone output with volume control, a Remote Commander remote control with 25-key direct access track selection, and a suggested list price of \$600. For more information, contact Sony Electronics, 1 Sony Drive, Park Ridge, New Jersey 07656. Tel: 1-800-635-SONY. Circle EQ free lit. #112.



## KEEP IT QUIET!

**T**he GML Digital Noise Filter is a 1U rack-mount processor unit with desktop controller. Designed for the selective, real-time removal of low to medium-level noise artifacts, the all-digital system features eight straight-line controls that adjust the thresholds for 64 linearly-distributed frequency bands. The GML 9550 utilizes eight two-color LEDs to indicate whether, and the degree to which, each group of bands is being gated. The unit supports AES/EBU, S/PDIF, and Toslink optical I/O, as well as external word clock. Retail price is \$4500. For more details, contact George Massenburg Labs, 7821 Burnet Avenue, Van Nuys, CA 91405. Tel: 818-781-1022. Circle EQ free lit. #113.

When choosing a tape, performance is key. Enter Sony DARS Metal Particle and Metal Evaporated tapes for the DTRS 8mm format. They're two distinct tapes, based on your needs. And both were designed to stand up to the daily grind of overdubs. We know your music means everything. So we help you keep it that way. To hear more about our digital audio, call 1-800-955-SONY.



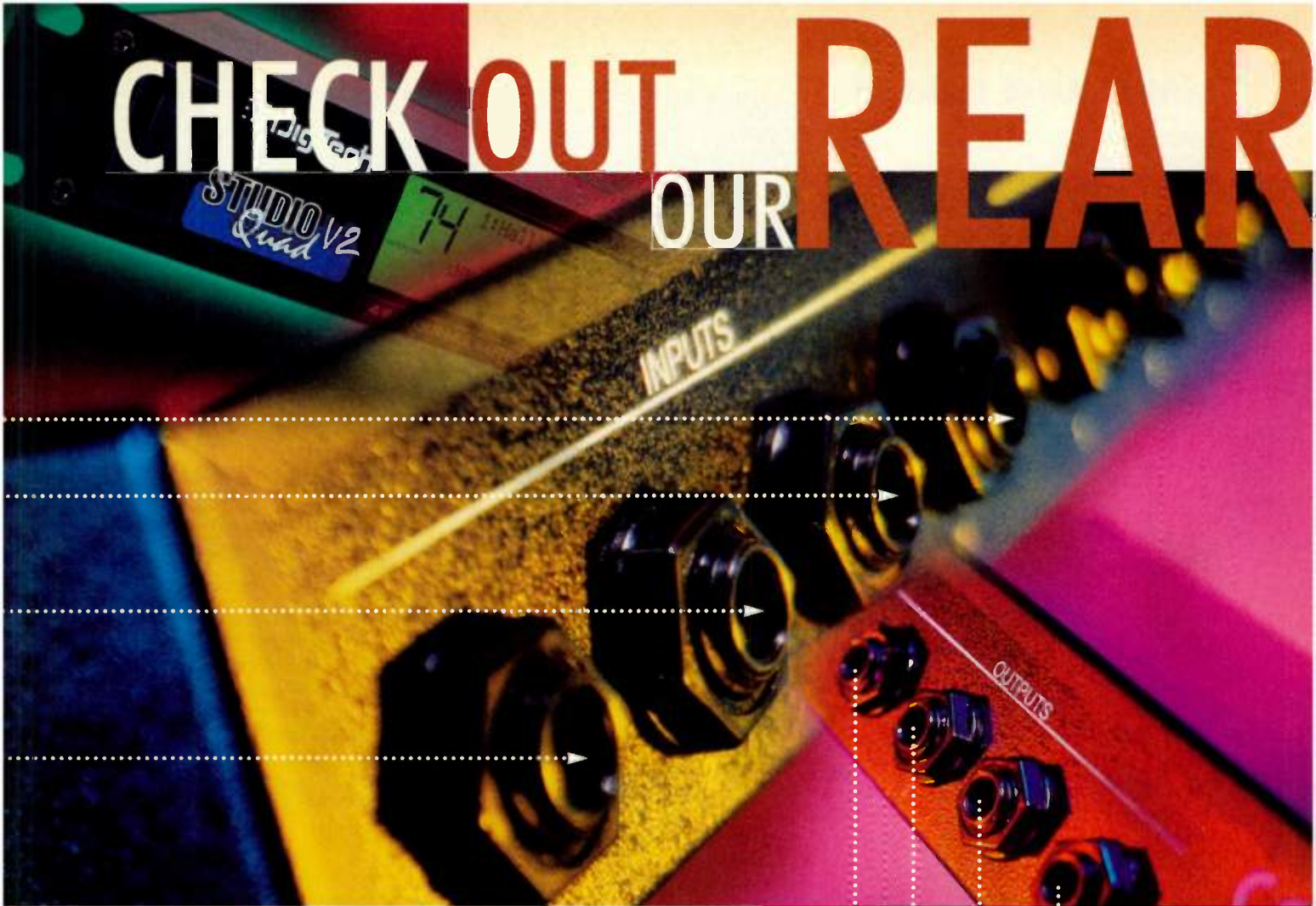
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DIGITAL TAPE  
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# CHECK OUT OUR REAR



The Studio Quad features 4 completely independent inputs and outputs that give you the power of four independent mono processors or two true stereo processors. Imagine the power to process two true stereo sources simultaneously without sacrificing control. But true stereo is only the beginning. Imagine having 4 independent reverbs for vocals, guitar, keyboards, and drums, where each reverb can be optimized specifically to achieve the best audio performance for each application. And imagine a processor that gives you the power to create any combination of effects, in any order. Then multiple by four.

And now the Studio Quad has been super charged with new V2 software! New effects, new flexibility and new Programs lift the Quad even higher above the competition. With it's ingenious user interface, large custom display, and potent S-DISC® technology at its heart, the Studio Quad V2 is capable of not just replacing, but thoroughly eliminating the need for multiple, expensive, single-purpose processing units.

- 4 independent Ins and Outs
- The equivalent of 4 signal processors in 1!
- Large custom display
- New, easy-to-use interface
- Multiple Input/Output signal path Routings
- An extensive collection of Effects
- S-DISC® powered
- Automatic Input Leveling
- Dynamic Parameter Modifiers
- Full MIDI Implementation
- True Stereo Effects

CIRCLE 23 ON FREE INFO CARD





## AMONG THE CONVERTED

**T**he DA924 96 kHz 24-bit digital-to-analog converter from dB Technologies converts incoming digital inputs (up to 24 bits) into analog audio signals. The unit also accommodates today's standard 40–50 kHz sample rates as well as the higher rates of the new 80–100 kHz standards. A triple-segmented design improves the accuracy of the ten most significant bits. The DA924's DC offset provides low-level detail by keeping low-level signals away from the most significant bit transitions. The DA924 also utilizes a DSP controlled crystal oscillator and a short buffer memory (for temporary storage) to help eliminate jitter in the incoming data stream. For further information, contact Audio Intervisual Design, dB Technologies, 1155 N. La Brea Avenue, W. Hollywood, CA 90038. Tel: 213-845-1155. Circle EQ free lit. #114.



## GROOVY UPGRADE

**G**roove Tubes' new generation of vacuum tube condenser microphones, the A Rev series, feature a totally revised circuit topology using a dual-triode tube that increases the dynamic range of the electronics more than 10 dB, while lowering the distortion by a factor of 10. The A Rev series have the same capsules and outward appearance as their predecessors—the MD1, MD2, and MD3 (now the MD1A, MD2A, and MD3A) — but internally, they are totally revised. The series feature newly designed electronics and output transformer, a low-noise 12AT7-M tube, a specially designed Sorbothane capsule mount, and internally adjustable polarization voltage. Groove Tubes has also upgraded the PS2A power supply by adding an Earth Lift switch that separates internal common from Earth, and by giving it the ability to power any two GT tube mics, two GT tube mic preamps, or any two EQ1 tube equalizers direct to the preferred recording format. The A Rev mics and the new PS2A power supply will be introduced with no price increase. Groove Tubes will also perform A Rev upgrades on earlier GT mics for \$150 for the MD1, or \$200 for the MD2 and MD3. For more information, contact Groove Tubes, 12866 Foothill Boulevard, Sylmar, CA 91342. Tel: 818-361-4500. Circle EQ free lit. #115.

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Tape should never change your groove. So Sony ADAT<sup>®</sup> cassettes never do. They keep music sounding the way it was meant to, with reliability that won't leave you staring at "ERROR 7" at 3 a.m. And you have the option to create in both 40 and 60 minute lengths. Sony. It's the safest place to put your music. For more information, call 1-800-955-SONY.



**SONY**

Recommended by  
**adat**

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# EQ STUDIO WARE

## THE HUMAN FACTOR

Instead of individually adjusting "faders" onscreen, Pro Tools users can track and mix hands-on thanks to Mackie's "Human User Interface" (HUI) digital audio workstation control for mixing with ProTools 4.0. The HUI provides visual and tactile controls for enhanced mixing and editing capabilities, allowing the user to mix via a real control surface. Included in some of the HUI's features are eight 100 mm professional-grade, touch-update, readily reassignable, motor faders; a per-channel LCD scribble strip; dedicated per channel pan and send encoders and controls for routing, assignment, status, edit, and automation control; an analog control room section with talkback and three stereo I/O pairs. For more information contact Mackie Designs Incorporated, 16220 Wood-Red Road NE, Woodinville, WA 98072. Tel; 800-898-3211. Circle EQ free lit. #116.



PRELIMINARY 11/96

## MASTER OF THE HOUSE

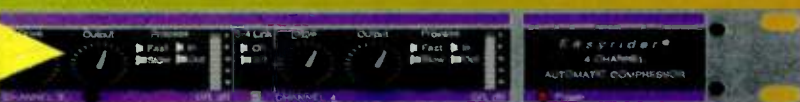


Microboards Technology, Inc. has released the AD Maker, which creates Red Book audio glass-master ready discs from both edited and unedited DAT tapes while also allowing onboard editing. The AD Maker software supports CD-XA, CD-ROM, CD-I, and custom CD Image, and comes with a 4X CD-recorder, high-density DAT tape drive, and two SCSI channels. Users can even configure the AD Maker with a MUX board to enable simultaneous duplication of up to 16 discs. The AD-Maker also features a built-in membrane keyboard, and the editing capability allows the user to select individual tracks at any desired order for disc placement. In audio processing mode, the AD-Maker burns audio tracks or imports audio from any WAV file, DAT tape, or CD-ROM by track number. Price is \$5995. For more details, contact Microboards Technology, Inc., P.O. Box 846, Chanhassen, MN 55317. Tel: 612-470-1848. Circle EQ free lit. #117.

# Sound better than you ever imagined...



104 Aphex Aural Exciter® with Big Bottom® - 2 channel



106 Aphex Easyrider® Compressor - 4 Channel



108 Aphex Easyrider® Compressor - 2 Channel

**TUBESSENCE®**

12AT7 - Used in 107 and 109  
Contact Aphex for the full technical scoop.

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

**105:** The Logic Assist makes this gate the most accurate and easiest to use in the world - no false triggering, clicking or chattering. The proprietary Aphex VCA 1001 ensures total audio transparency.

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

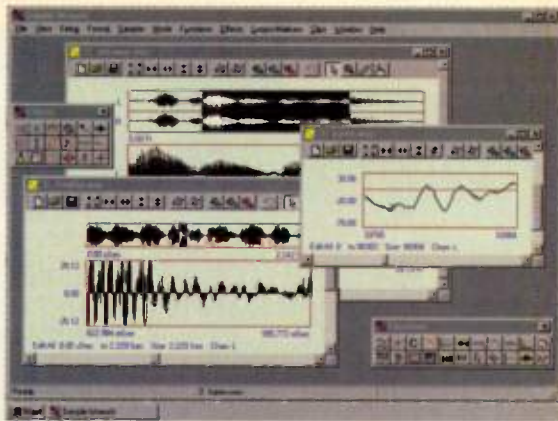
**107:** The award winning, #1 selling Tubessence mic preamp is the perfect marriage of solid state and vacuum tube circuitry. Upgrade the sound of all your mics with uncolored detail, presence and warmth.

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



## THROW A WRENCH IN YOUR SYSTEM

**S**ample Wrench 4.0 from dissidents is a 32-bit Windows 95 application that offers a CD-quality visual sound sample editing package for mono or stereo sounds. The software works with both Windows sound cards and a variety of MIDI keyboard samplers such as the Akai S1000, Prophet 2000, Ensoniq EPS, Roland S770, and others. Sample Wrench offers an array of processing functions and effects including extensive EQ, amplitude compressor/limiter/expander, time compression, pitch shifting, gain envelope, AM and FM functions, and more. Sample Wrench also comes complete with a Visual Basic compatible macro/scripting language that can be used to create batch processes, automate repetitive tasks, or to access Sample Wrench as a calculation engine. The suggested retail price of Sample Wrench 4.0 (which *does not* run under Windows 3.1) is \$299. For more details, contact dissidents, 10325 Woods Road, Utica, NY 13502-6723. Tel: 315-797-0343. Circle EQ free lit. #118.



## SADIE CUBED

**S**tudio Audio and Video Ltd., the manufacturers of SADiE Digital Audio Workstations, have released SADiE3, which is designed to run on the existing SADiE hardware and Studio Audio's new modular digital workstation, Octavia. Among SADiE3's enhanced features is DRD, the Dynamic Reallocation of DSP power. This process only allocates DSP power to a given process for the time that it is in use, and then the software relocates this power to other processes. This enhances the efficiency of the system, allowing more streams for playlist editing and unlimited virtual streams. Other new features include AFI (Audio Format Interchange), which enables SADiE3 to read and write most of the major manufacturers audio formats native, without any file conversion; background recording (multitasking); clip-based automation of level, pan, EQ, and dynamics; playlist editing of all mixer automation data; clip grouping; and background auto-conforming. For more details, contact Studio Audio Digital Equipment Inc., 1808 West End Avenue, Suite 1119, Nashville, TN 37203. Tel: 615-327-1140. Circle EQ free lit. #119.

# ...at a price you won't believe

~~\$795~~  
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\$449



107 Aphex Tubessence Mic PreAmp - 2 channel



### Is there really a tube in there?

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

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

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109 Aphex Tubessence Parametric Equalizer



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105 Aphex Logic Assist™ - 4 Channel Gate

# APHEX SYSTEMS

Improving the way the world sounds™

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

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

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# RCA MI-6203-B

With respect to Craig  
Anderton, find out what's  
inside this MI

**MICROPHONE NAME:** RCA MI-6203-B Varacoustic Microphone

**FROM THE COLLECTION OF:** William Stace/Walls Have Ears

**TYPE OF MIC:** Ribbon

**POLAR PATTERN:** Variable: omnidirectional, bidirectional, or cardioid

**FREQUENCY RESPONSE:** 60 Hz to 10,000 Hz  
**OUTPUT IMPEDANCE:** 250 ohms (see notes below)

**EFFECTIVE OUTPUT LEVEL:** -58 dB (unidirectional, 0 dB -0.001 watts; sound pressure=10 dynes per square centimeter)

**DIMENSIONS:** 6.875 inches (length) x 2.75 inches (width) x 2.625 inches (depth)

**WEIGHT:** 3.5 pounds

**MIC NOTES:** RCA's MI-6203-B (and its high-impedance cousin, the MI-6204-B) was manufactured in the early to mid 1940s for use in public address systems, amateur radio, and stage applications. Instead of being open on both sides as in a typical velocity microphone, the '6203's ribbon is coupled to an acoustic labyrinth that forms the body of the mic. A slotted tube sits at the back of the ribbon and vents to this labyrinth. By moving an adjustable slider (labeled "P," "U," and "V") various openings are formed. When completely closed (P), the mic acts as a pressure mic and picks up sound omnidirectionally. At the velocity (V) setting, the vent is wide open and the mic acts bidirectionally. Set to U, the pickup pattern becomes unidirectional. Openings smaller or larger than the critical settings produce directional patterns with various sized rear lobes. *[Technical data courtesy of Bob Paquette and Clarence Kane.]*

**USER TIPS:** Owner William Stace notes: For vocals, I run it through a Bellari tube mic pre and tube compressor, and then direct to tape for a rich, smooth vocal sound. If the singer has a bit too much low end or is prone to pops, I can use the variable settings at the rear of the mic to quickly eliminate this problem. The mic also works very well on acoustic instruments. **EQ**



Photo by Edward Colver



# How do you change your thinking about recording?

## Just UNDO it.

We knew musicians would need a lot of reasons to consider changing their attitudes about the way they made music. So we started with 999 levels of undo and kept on going.

As a recorder, the VS-880 has everything you need. With 64 virtual tracks to play with, you can record multiple takes, choose, edit and compile the best parts to create the perfect track. Of these 64 instantly accessible tracks, you can choose eight for final mixdown.

With non-destructive editing, you can copy, move, exchange, insert, cut and erase tracks with the press of a button. If you're not satisfied with that edit, just undo it to return it to its original



state. Locators, markers and advanced editing functions like Scrub Preview, Time Compression or Time Stretch take full advantage of the VS-880's power.

In addition to all of these editing features, the VS-880 comes with a 14-channel digital mixer that's fully automatable via MIDI. And a VS8F-1 Effect Expansion Board can be easily

user-installed, giving you two totally independent stereo multi-effects processors.

There are several ways to get to know more about the VS-880. You can try it at your Roland dealer. You can call (213) 685-5141, ext. 798 to order a free demo video. You can visit one of our online sites or use our fax-back number. But don't wait, because this is one decision you won't change your mind about.



## Roland VS-880 Digital Studio Workstation

Roland Corporation U.S., 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685-5141  
 Roland Canada Music Ltd., 5480 Parkwood Way, Richmond, B.C. V6V 2M4 (604) 270-6626  
 Fax-Back Information: (213) 685-5141, ext. 271  
 COMPUSERVE™ GO ROLAND  
<http://www.rolandus.com>

Measures, beats, time readouts, play lists, fader/pan positions, wave forms, EQ curves, and more can be viewed on the VS-880 display to give you a comprehensive look at your work in progress.



With 64 virtual tracks, you'll never run out of room for creative input. Record a solo multiple times, keep tracks you bounce for re-mixing later, edit several versions of vocal tracks for instant comparisons, or keep a "dry" version of your guitar part for adding different effects later.



With Scrub Preview, edit points are easy to find because you hear them at their original pitch. With editing resolution for finding edits at 1/3000th of a second, you can make edits precise enough to remove even the tiniest breath or guitar pop.



Just a few of the effects that can be added during recording, bouncing or during final mix in realtime are reverb, 3D RSS™ stereo delay, chorus, flanging, phase shifting, Roland's COSM-based distortion/overdrive and guitar amp emulation, vocoder, pitch shifter and more.



Do things that are impractical with tape-based digital recorders. Move percussion parts instantly. Exchange, copy and paste multiple guitar solos. Erase and insert new endings. And just about anything else.

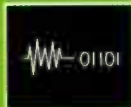
The locators and 1000 markers take full advantage of the VS-880's random-access capabilities. Just choose a point and you're instantly there. Every aspect of the creative process is faster and easier.



Every mixer setting, including virtual tracks and effects, can be saved as a scene. Store a snapshot of a mix when you're bouncing tracks. When you need to re-bounce the tracks to adjust some of the levels, you still have the originals saved on virtual tracks.







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

# 168RC Digital Recording Console

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

The 168RC is the first digital console to feature two ADAT optical interfaces (yielding 16 channels of digital input) and eight analog inputs as standard equipment. It makes the creative control and sound quality of an all digital, fully automated recording system an affordable reality.

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

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

The 168RC is equipped with three-band EQs



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

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

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

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

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

**SoundLink DRS**  
Digital Recording Systems

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

**KORG**

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# SoundLink DRS 1212 I/O Multi-Channel Audio Interface



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

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

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

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



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

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

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

**SoundLink DRS**  
Digital Recording Systems

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**KORG**



# Merril Bainbridge's "Mouth"

EQ talks to Siew, the producer of Merrill Bainbridge's hit record "Mouth" from *The Garden* CD

BY STEVE LA CERRA

**EQ:** One of the most interesting aspects of this song is the percussion loop that begins the song. How was this created?

**Siew:** It's actually a combination of

things. We brought a local rapper into the studio (001 Studios in Melbourne, Australia) and we basically gave a him a set of cans, put a click track into them, and he just went for it for about three hours. He did all these different beat sounds vocally. You can hear a lot of hi-hats that were actually created with vocals. Then he also did a lot of rhythmic breathing sounds that you can hear, as well as a lot of little vocal artifacts. I told him to go for it, and (my coproducer) Owen Bolwell and I recorded everything he did. We then effectively used segments of it — like maybe two bars long — and turned them into loops. There were a couple of drum things that we added that came from sample CDs, too, so it is a combination. Also, underneath his vocal kick sound is a Roland TR909 kick drum tuned down really low, so it's a real mix.

**How did you deal with sampling and looping his vocal parts?**

The sampler we used right through the entire project was an Akai S1000, but the rapper's voice was never actually sampled. We recorded his vocals directly into a Soundscape hard-disk editor. We cut them up and then sync'd the hard-disk editor to tape. Soundscape was great, and it was very easy to use. We recorded this about two years ago, and at the time we were using the first version of Soundscape. [Editor's note: "Mouth" was a number 1 hit in Australia approximately one year ago.] It was a no-frills thing and it didn't have time compression, but it was simple to use. When you know you are going to edit vocals or percussion like this, it is much faster to record onto hard disk than to use tape. You can record as many virtual tracks as you want and send the rapper home. Then you can spend the whole night going through bits and pieces and finding what you want to keep. Obviously it's digital, so you can jump straight to the parts you need without having to run tape over and over again.

**Did the rapper do a lot of layering or overdubs?**

We would first work on one thing such as just the bass drum, and when we had something we liked, we would go to a different sound like the hihat and work on that. Obviously, all of this was very experimental. While we were doing it we really had no idea whether or not it would work out with the track.

**Would you then create separate loops with the hihat and the bass drums?**

Yes, and then put them all together. To add some kick to it, we added the '909 as well — there's also a '909 snare in there as well.

**How were the 909 parts dealt with?**

They were sequenced with an Atari computer and C-Labs Notator (which, unfortunately, is out of the window now). The Atari was chasing hard disk and, in the end when we got Merrill's vocals recorded, it was chasing tape. A lot of the parts like vocals and bass lines went to analog tape. We worked basically that way for the entire project. **EQ**



**GARDEN PARTY:** Bainbridge enjoys success with her American recording debut.



# Digital Audio Labs V8 System

All "I could have had a V8" puns aside, DAL delivers a studio-friendly computer hardware system

BY STEVE LA CERRA

While hard-disk recording on the PC platform has steadily grown more affordable, there has remained one fundamental problem: no manufacturer has really made it any easier to interface your PC to the analog world. Sure there are a lot of sound cards available and a number have audio "snakes" that break out into I/O connectors, but who wants to deal with that? In the real studio world, connectors get plugged into patch panels — not into a rat's nest of cables and connectors dangling behind your computer. Digital Audio Labs has realized this problem and has come forward with an answer: the V8 system.

Since the V8 system is exactly that, there are several components involved here. There's the Main Board (which lives in a full-length 16-bit ISA slot in your PC), optional DSP Supercharger with the also-optional RAM Induction, and several I/O Peripherals: Big Block, Deuce Coupe, MDM Custom for ADAT, and MDM Custom for DA-88. You will notice that there is no software; Digital Audio Labs has done this intentionally because they feel there are other companies who have much more experience writing software than they do. So the V8 system is designed to work with third-party software. Some of the companies currently manufacturing V8-compatible software include Minnetonka Software (MxTrax), SEK'D (Samplitude 3.0), EMAGIC (Logic Audio 2.6), and Cakewalk Music Software (Cakewalk pro Audio 6.0). You'll know a V8-compatible program by the mark of DAL's "Gearhead Approved" seal.

V8 hardware is designed to support 16-track hard-disk recording, and the Main Board is the core of the system. Amazingly enough, you do not have to tell the Main Board what peripherals are

in use — the V8 finds all attached components, registers them, and makes them available to your software (what a concept! — no hacking). Sixteen simultaneous channels of I/O are supported by the Main Board across the V8 bus(!). This would be effectively accomplished using two of DAL's Big Blocks. Big Block is a two-space rack unit with eight actively balanced, 1/4-inch TRS inputs and outputs as well as stereo optical, S/PDIF and AES/EBU digital I/O.

One really cool feature of the system is that these eight I/Os can be configured and calibrated via software. You could (for example) calibrate I/Os one through four for -10 unbalanced operation while calibrating I/Os five through eight to +4 balanced. This information is memorized on a per-project basis, so if your next project requires a setup with all eight I/Os at +4 balanced, changeover occurs when the new project is loaded in. If your studio requirements don't call for eight I/Os, you could go for the Deuce Coupe: a stereo analog, stereo digital (AES/EBU, coax and optical S/PDIF) interface that fits into an 8-bit ISA slot. Both the Big Block and the Deuce Coupe use dual 16-bit delta-sigma converters with 64-times oversampling on the A-to-D and 8-times oversampling on D-to-A conversion. (FYI: You can use multiple Deuce Coupes as well as multiple Big Blocks in a single system.)

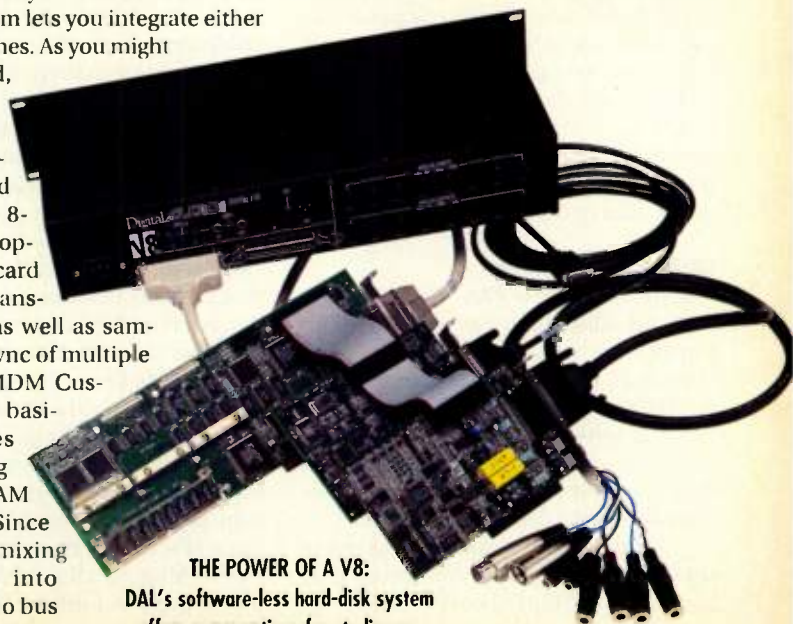
If you already own an ADAT or DA-88, the V8 system lets you integrate either of those machines. As you might have expected, the MDM Custom for ADAT is an 8-bit ISA card providing an 8-channel ADAT optical I/O. This card also allows transport control, as well as sample-accurate sync of multiple ADATs. The MDM Custom for DA-88 basically provides the same thing for the TASCAM TDIF format. Since you might be mixing your DA-88's into the stereo audio bus along with your

hard-disk tracks, the V8's mixing and routing section really doesn't care whether inputs are fed from disk, MDM tracks, or DSP plug-ins.

Besides the ability to mix your V8 inputs, the mixing and routing section can be used as a fully-automated digital mixer with built-in automated signal processing. Signal processing is available in the form of plug-ins from KS Waves and Wave Mechanics; DSP power can be easily increased by adding the DSP Supercharger or the RAM Induction module. If that's not enough, each DSP Supercharger has a slot for a RAM Induction module with either 32k or 128k SRAM for enhancing time-dependent algorithms such as reverb or delay. Finally, the Main Board also supports use of DAL's popular CardDPlus as a stereo I/O.

Suggested list prices are as follows: Main Board, \$1795; Big Block, \$1995; Deuce Coupe, \$695; MDM Custom for ADAT, \$695; MDM Custom for DA-88, TBA; DSP Supercharger, \$495; RAM Induction Module-32k, \$295.

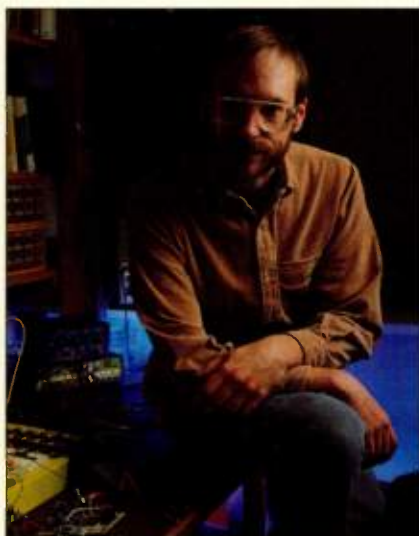
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# AES Trends



## One last look at what the trends revealed at the AES Convention really mean

BY CRAIG ANDERTON

Aside from being educational and exhausting, the AES Convention helps point the way to the future in pro audio. Studying the trends at AES can help you anticipate what's around the corner and give you the info needed to get into the right technology at the right time — instead of being caught on the wrong side of the leading edge. In no particular order, here were some of the more interesting trends at AES.

### CD-R: FEEL THE BURN

Finally, recordable CDs are getting affordable, and much more reliable. Two harbingers of things to come: Microboards' PlayWrite 2040 bundle, which for \$695 includes a CD-R drive and CD creation software for the PC, and Ricoh's announcement that they will be introducing erasable CD-R media with associated recorder/players in early 1997.

Meanwhile, to take advantage of this hardware, more computer programs are offering CD burning as a plug-

in or option. Sound Forge, Samplitude Master, Spectral, and Digidesign's Masterlist all support creating Red Book CDs from within their respective platforms. It shouldn't be too long before one-off CDs are as common as DAT copies — if not more so.

### DIGITAL MIXERS

Look what Yamaha started with the ProMix and 02R. TASCAM announced a digital mixer, although it was in a very preliminary state and pricing and functions have not yet been fully determined. However, not everything is "on the horizon." RSP Technologies is now taking orders on its Project X digital console (models go all the way up to 64-input/32-output). And Yamaha is at it again, this time with the 03D — a smaller, more compact version of the 02R designed for post and music production. At under \$4000, it establishes a new price point for a pretty-full-featured digital console.

Rumor had it that Mackie was going to show a digital mixer at the show, but it seems we'll have to wait until NAMM to see if this becomes reality. I also wouldn't be surprised if some company came out of the blue with an affordable digital console — perhaps some unexpected player like E-mu or Kurzweil.

### INTERNET: PUBLISH OR PERISH

Music publishing on the Internet was a Big Deal at AES. Apparently, the idea of publishing music without CDs, distributors, meeting with lawyers, and all the other accouterments of the record business is a compelling one. Several products (e.g., Sound Forge 4.0) now support Internet audio publishing tools such as RealAudio, but the company that got the most attention was Liquid Audio, purveyors of "mastering software for the Internet." And that's exactly what happens: you decide on sound quality, target modem speed, and other variables, then let 'er rip. The result is a compressed file suitable for real-time transmission or downloading.

Compression in general is becoming a hot topic. Although driven in many ways by the Internet, compression technology should also result in more efficient archiving of digital audio (something we all need!) and perhaps more tracks in multitrack recorders.

### BIGGER & BADDER SOUND CARDS

The Windows environment has gone way beyond SoundBlasters, and now includes boards with ADAT interfaces, multiple channels of digital and analog I/O, PCI rather than ISA support, and much more (of course, you pay a lot more, too). One other trend is clear: get audio out of the computer, and transfer in and out of there digitally. This is definitely the way to tame your noise floor. Also, there is an increasing movement toward Windows NT as the "professional" Windows environment, although most software support Win 95 as well.

As examples of the new generation of boards, the PCI-based Antex Studio-Card includes four channels of digital I/O (AES/EBU or S/PDIF) and four channels of balanced/unbalanced analog I/O. Digital Audio Labs takes a modular approach with its ISA-compatible V8 (see the First Look on page 35); you can add various I/O cards, depending on your needs (ADAT, S/PDIF, AES/EBU, analog, etc.), although it gets pretty pricey if you really deck out the system. Then there's Frontier Designs' WaveCenter ISA card with coax and optical S/PDIF/ADAT light pipe/MIDI interfaces, and Aardvark's Studio 12 Multichannel PCI Audio Card for Windows 95/NT (12 channels of simultaneous record and playback — ADAT light pipe, TOSLINK, 2 channels of 18-bit analog with 1/4-inch unbalanced connectors, S/PDIF with RCA jacks, and AES/EBU with XLR).

For those with some serious bucks, APT's ADK200 offers several coding systems as well as simultaneous multichannel playback and record, individual channel processing, and crossfades; I/O includes 16-, 18-, and 20-bit digital, and unbalanced/balanced analog. At the lower end, Hohner Midia's ARC 44 bundles a 4-analog-in, 4-analog-out, PC-compatible ISA board (all I/O usable simultaneously) with 8-track, hard-disk recording software based on Samplitude. And for those who crave high-resolution digital, the AdB Multi!Wav Digital PRO18 can do 24-bit digital transfers under Windows without requiring a proprietary, relatively expensive system. In conjunction with the new Steinberg





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WaveLab 1.5 or latest Samplitude WAV editors, project studios can now do 20- and 24-bit audio mastering at a reasonable price.

And for the Mac, Lucid Technology's NB24 (\$399) is a NuBus digital audio card for the Mac with S/PDIF input and output. It's Apple Sound Manager compatible, can lock to virtually any incoming sample rate from 22.050 to 48 kHz, and, yes, now you can move digital audio in and out of your Mac without paying an arm and a leg.

**PROJECT SPEAKERS**

We're not in NS-10 land any more, folks. Relatively small, active powered monitors have become all the rage. Many of them are shielded in anticipation of their spending considerable time sitting near a computer monitor.

A few standouts were the Tria Monitor System from Event Electronics (two shielded desktop speakers and an 8-inch subwoofer), the Alesis Point Seven shielded reference monitors (they don't take up a lot of space, but sound a lot bigger than they are), and the big sur-

prise of the show, Mackie's HR824 bi-amplified active reference monitors. Responses are getting flatter, the sound is getting smoother, and this current generation of project studio monitors give a level of quality commensurate with the quality increase in related gear.

**PITCH-SHIFTING THAT DOESN'T SUCK**

DigiTech and IVL got there first with hardware boxes, Mark of the Unicorn added the concept to Digital Performer software, and now it seems that everyone is implementing pitch-shift technology that can also keep formants adjusted properly, thereby avoiding an overly artificial sound with large amounts of transposition. Opcode and Emagic have improved the pitch-shifting in their MIDI + digital audio sequencers, Wave Mechanics has produced a plug-in for Pro Tools that does real-time pitch shifting with formant correction, and AnTares has a pitch corrector plug-in that actually can "quantize" solo notes to any type of scale, including just intonation and microtonal scales. Now that's pretty amazing (and given some singers, absolutely necessary).

**DUTY NOW FOR THE FUTURE**

And what will be the big deal at next year's AES? First, the PCI bus takeover will be more or less complete. Having a board that's compatible with Mac OS or Windows machines is a dream for manufacturers and stores (less inventory), consumers (one size fits all), and computer and software companies (it's nice to be supported). ISA won't go away, and NuBus is still a factor, but PCI is the wave of the future — and possibly sooner than most people think — the wave of the present.

The IEEE 1394 "Firewire" spec is also going to be a big deal. While not yet established, this looks like the logical successor to SCSI as the best way to transfer large amounts of audio, video, and MIDI between computers and the real world (and might also make MADI less relevant). EQ will be keeping an eye on this development to see where it goes.

And finally, people are keeping their fingers crossed on DVD. There are some major questions that remain to be answered (backward compatibility, recordable media, and how much do you charge for a CD that has the equivalent of a multi-CD boxed set on it?). Still, storage is the name of the game as we swing into the 21st century, and DVD holds a lot of promise.

So what's going to happen at NAMM? See you then.



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# The Amazing Analog Live Snare Fix



Photo by Jim Herrington

Forget sampling and do it the old-fashioned way

BY AL KOOPER

Don't ask me why, but the result of recording live snare drum within a rock band is usually incredibly disappointing and often unfixable...until now. A trick that has been handed down from one generation to...well...now *you* — has saved many a snare drum from being zapped and re-recorded. No need for this sort of tactic anymore, my friends, but here's what you will need:

1. The finest sounding snare drum you can find. Beg, borrow, or rent it. You'll only need it for one day if there is one open track on your live multi-track.

2. A very small, Auratone-type speaker with as wide a frequency range as possible and a tolerance for power not unlike an actual Auratone, which is the speaker of choice for this fix.

3. The plastic rim from a 2-inch reel of tape that is used to contain the tape on the reel for storage purposes (or a reasonable facsimile).

4. A great snare drum mic — Al says: a Shure SM57, an AKG 452, or a Sennheiser MKH 40, but we all have our favorites.

Now you have the ingredients for the fix. Here is the recipe:

Take the plastic rim and place it parallel on top of the snare drum head so that it apes the diameter of the drum-head (see fig. 1). Place the Auratone, speaker facing *down*, on top of the plastic rim, so that the rim is totally supporting the weight of the speaker and the speaker is approximately two inches from the snare drum head.

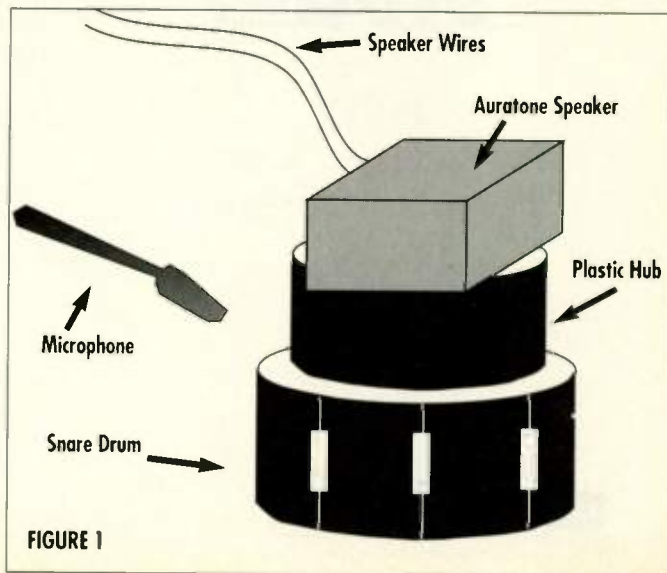
Feed the original snare drum signal (albeit slightly gated to remove as much leakage as possible) to the Auratone. By adjusting the amount of level, you can actually have the Auratone "play" the snare drum and emulate all the dynamics of the original drummer! Varying the gating and volume feed are the two tweaks that you will have to vary in each individual situation. Mic the drum as you usually would do, although you have the option of using a lot more ambience to duplicate the "live" environment. If you have the luxury of not renting any of this stuff, it's nice to have it going on live while you mix. That way there is more inherent control over the various sonic parameters within each song.

Many drummers rely on rim shots to power the backbeat live. This technique, while quadrupling the actual volume of the snare drum, adds an unpleasant midrange to the color that has been the bane of many a producer and engineer over the years. Many younger drummers bring this technique unknowingly into the studio environment after so many years of playing live with no studio experience. If

they have trouble breaking this habit, I use "The In-Studio Rim-Shot Fix." To do this, I tilt the snare drum toward the drummers 'til it is at an angle that will cause them to strike their own scrotum if they attempt to hit the rim. This is a pretty quick fix and will instantly break years of any ingrained habit. As you may well imagine, it does not work with female drummers.

Last year when I was mixing my own live album, *Soul Of A Man*, I used the snare drum fix throughout the entire album. I was mixing in Nashville, but I knew of an amazing snare drum owned by my friend Evil Wilhelm in Los Angeles. I rented the drum from him for two weeks and he air-freighted it to me ASAP. Although there were two different drummers on the project (Anton Fig and Roy Blumenfeld), their dynamics and different styles came through perfectly on the one drum. One cannot achieve this by digitally triggering a sample because there is simply *no* dynamic range working. Every hit of the sample is always the same volume. We had songs where Anton was using *brushes* and were able to capture every nuance of his brush work. So, somehow I see this Rube Goldberg analog fix surviving all the newest technology, and still being the state-of-the-art postproduction snare drum panacea for many years to come.

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# What Makes A Great Masterer?

When it's time to take your tapes to the all-important mastering stage, who do you trust?

BY PATRICK STAPLEY

Remastering, mastering, cutting — call it what you will, as the job has assumed many titles over the years — is an art that few outside of the confines of the mastering room really understand or appreciate. Mastering is an important part of any project, and, as difficult as it is to admit, it is the part that often requires a different set of ears — preferably those of a mastering engineer at a commercial facility.

Whereas it is widely regarded that a good recording engineer and producer play a significant part in the success of a record, the same is not always thought of the mastering engineer. At one extreme, mastering is regarded simply as a copying process: the artistic and creative side having been completed in the recording studio, it now just remains to make an accurate transfer that can be sent to the mastering plant.

This, in fact, is a much better description of what should take place during factory mastering, not mastering, which, as the final stage in the production chain, is every bit as important as what has gone before. As anyone knows who has set foot in a mastering room with a "finished" master, it's the very last chance to put things right. Try telling the producer who has sweated blood, working day and night that his record is going to be premastered in a couple of hours and it's irrelevant who does it (a view unfortunately not uncommon in certain record companies) and you'll very quickly get an impression of just how important the job really is. Luckily, there are people who recognize the importance of mastering and the talent required to do the job properly. They also

realize that taking the cheapest option is false economy, as a great cut from a top mastering engineer can often tip the balance between success or failure.

So what are the qualities that make a top mastering engineer, and what is it that attracts clients back to the same engineer time and time again? Who should you trust your invaluable projects to? With the help of some of the most respected names in the mastering business both in the US and the UK, along with four top producers, we asked the question: What makes a great mastering engineer?

## MASTERING CHARACTER

"Mastering engineers provide a service that you don't get in a studio because they do this intangible thing of changing mixes into records," states UK-based producer Jon Kelly (Kate Bush, Chris Rea, Prefab Sprout, Deacon Blue, Beautiful South). "To do that successfully requires an excellent pair of ears and someone who really knows what they're listening to."

Kelly, who prefers not to spend too much time in the mastering room, says that confidence and familiarity are also essential factors. "It's important for me to walk into the cutting room knowing that the engineer know me and my work and is going to have a pretty shrewd idea of what I want things to sound like. Once we've run through things I much prefer to leave it all in the

engineer's hands, so it's important for me to feel completely confident in his skills. Also there should be enough of a relationship there for him to be really honest about things and if there are any problems to be totally up front about it."

Veteran producer, Gus Dudgeon (Elton John, David Bowie, The Beach Boys, Elkie Brooks, Chris Rea), also believes that relationships play a critical part and makes an interesting analogy: "I see the relationship between a producer and mastering engineer as similar to the patient/dentist relationship. Whenever you talk to producers about who they use for mastering, in the same way as people will al-

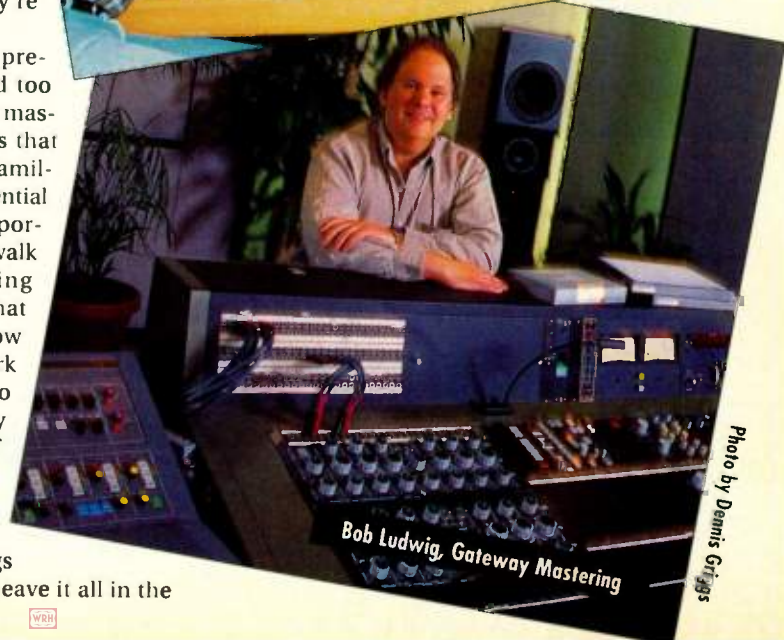


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Minds, Stone Roses, Radio Head, Cast, Kula Shaker) fully agrees. "You want to feel that the person is conscientious and 100 percent into what they're doing. They have got to be prepared to make changes and get into the finicky little details."

"Patience is terribly important," stresses Gus Dudgeon, "and you want someone who is prepared to go the whole distance with you, no matter how picky things get. When I remastered Elton John, we sometimes spent 10 hours on one song, and that required real perseverance. Some engineers will turn around and give you that 'for f— sake why don't you just leave it alone' look, and you don't need that."

**OPEN COMMUNICATION**

Good, honest communication is an aspect that rates highly on the mastering list of credentials. In particular, the ability to come up with good ideas and make suggestions. "I think a good engineer should be able to make plenty of suggestions — the more input the better," says Abbey Road mastering engineer, Chris Blair. "He should offer things to the producer that perhaps he hadn't considered before — creative things like varispeed, crossfades, and so on that can make a big difference."

However, just as it is important that an engineer should voice his own opinions, it is also vital that he should respect the client's. "It's sometimes very easy for a mastering engineer to have preconceived

ways go to the same dentist, they'll tend to recommend one guy they've been using for years. Just like a bad dentist, a mastering engineer can inflict considerable pain by making a mess of what it is you're trying to do. In my opinion, the number one criterion is to work with someone who is musically sensitive to what you've brought in, cooperative, and is genuinely interested in doing the best job he or she can."

Dedication to duty is viewed on both sides as extremely important. "The attitude, whatever the job, should be to put as much into it as possible to get the best result. Unless you put in that effort, you get dragged down market," says Whitfield Street mastering engineer Ray Staff.

US mastering engineer Bernie Grundman echoes this sentiment: "A great mastering engineer has to be 'on' like a performer — like someone who is going on stage every night. When the client comes in, the engineer has got to present the image that this job is as important as anything he has ever worked on and he's got to get involved 100 percent. Even if he doesn't like the music, there should be the enthusiasm there to get the most out of it and produce the best sounding record he can."

Producer John Leckie (XTC, Simple



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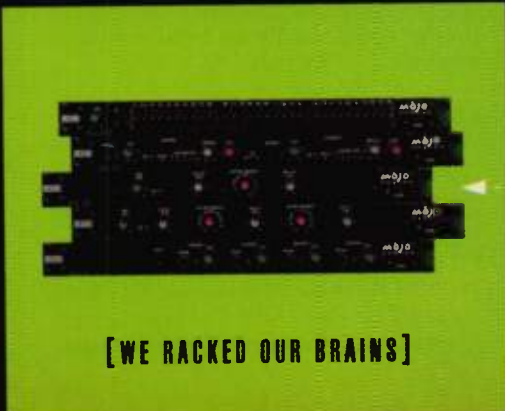
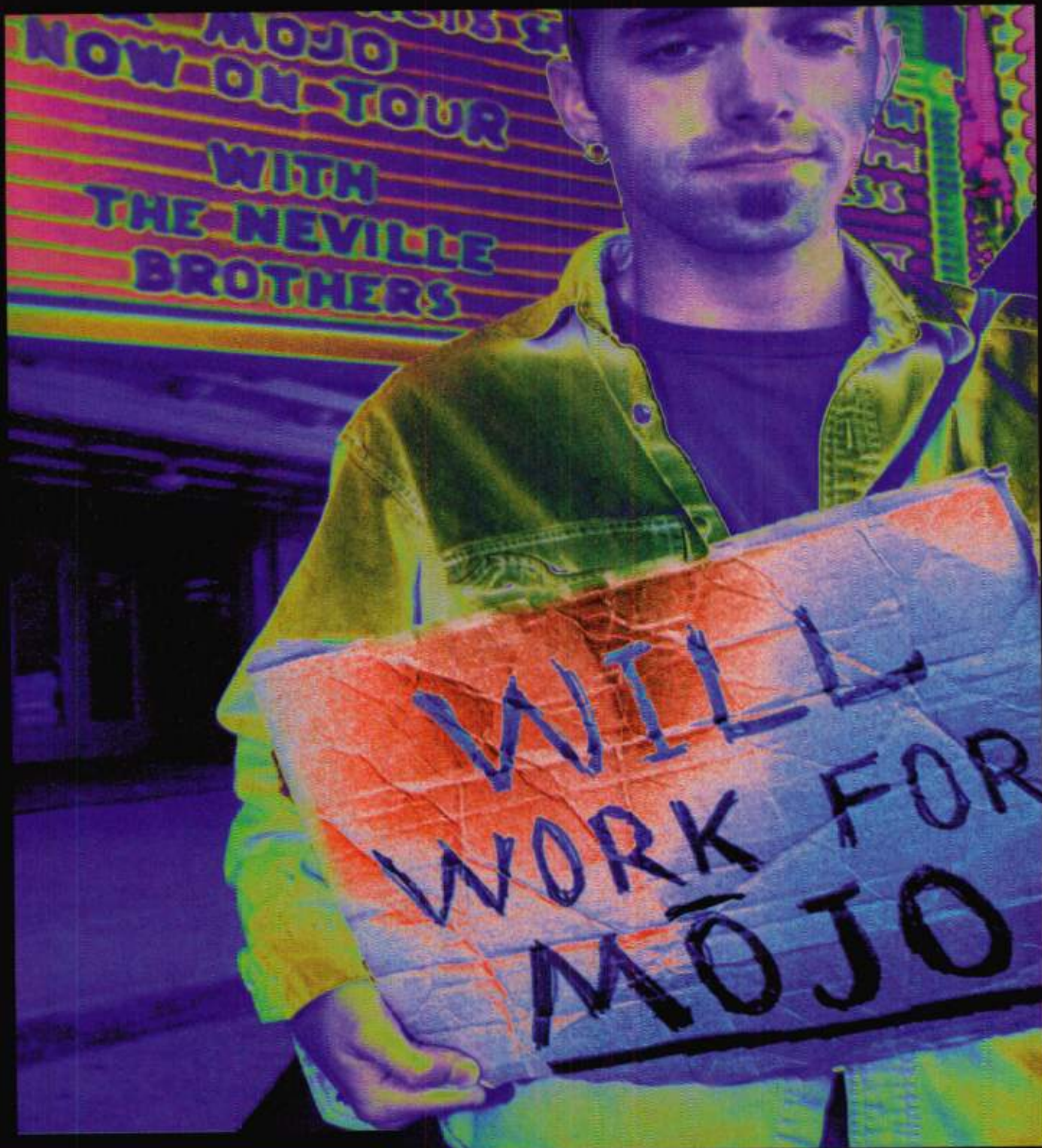
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idea and think they know it all," says Ray Staff. "So it's very important for the engineer and client to come together and bounce ideas off each other."

"A good engineer should always try to involve the client in the session, so they feel included and it becomes like a joint effort," agrees Bernie Grundman. "There are some mastering engineers who take over the whole session and exclude the client, and I don't think that's a very good attitude. After all, the mastering engineer is there to try and fulfill

the client's vision, not his own.

"An engineer has to remain totally open to a client's suggestions and be willing to try anything no matter how crazy it seems," continues Grundman. "Apart from allowing the client to hear for themselves what it sounds like, there are the occasions where it can actually work. So I think that's an important aspect — a good mastering engineer should not automatically assume he knows best but should always be prepared to learn something new.

Bob Ludwig carries the point further: "A really good mastering engineer is completely committed to the client and the music. He should be able to strike that fine balance between always having his own point of view and being able to give the client exactly what he wants.

"One of the major tips I learned for myself was that if the client says, 'I'd like you to do so and so,' and immediately your technical mind goes, 'Oh that can't possibly work,' no matter how much you disagree you should do it because the surprising fact is that a lot of the time it does work and you learn something from it."

However, both Ludwig and Grundman believe that it is also the engineer's responsibility to point out anything that could have an adverse effect on the record — for instance equalization that exaggerates sibilance or making a track so bass heavy that it will bottom-out speakers.

"I believe the engineer has the responsibility to warn or advise the client that the direction he's taking may not be the right one and come up with alternatives," comments Grundman. "This is often where it needs real tact and sensitivity, and the ability to be able to read people."

Interaction with the client and personality play a crucial part in the pre-mastering room and in Chris Blair's opinion at least 60% of the job is down to how you get on with the client. "You must have the ability to be adaptable with different types of clients and make people feel comfortable - you can't be a guy who just does his own thing and doesn't relate to other people."

Says Metropolis's Tim Young: "The most important thing is knowing how to handle people, and that's something you can't teach, it just comes with experience."

John Leckie also attaches considerable importance to personality, saying it plays a big part in why he chooses a particular engineer. "Apart from feeling comfortable with someone, I think honesty is very important, and I like to feel they're being totally up front without any bulls—," he says.

#### **HONESTY IS SUCH A LONELY WORD**

Honesty and sincerity are qualities that Gus Dudgeon also rates very highly in a mastering engineer, but sadly he says they are often hard to find. "It's a crucial part of their personality and two or three people I know do have it, but there are an awful lot that don't. I've seen occasions where an engineer will go through

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## TECHNIQUES MASTERING

the whole routine with the client, and as soon as he's out of the room, the volume's gone down to nothing and the engineer is sitting there with his feet up reading a magazine. It's all bulls— and the client's been fooled. If I found an engineer doing that, I'd never use him again."

"Honesty is terribly important," adds Bob Ludwig, "and in that respect I think you should avoid being gratuitous about anything. Also, just as there are occasions where you'll say to a client this sounds really good and mean it, there are other times where you have to tell people there are problems even to the extent that you may have to advise them to go back and do a remix." In this way, the experienced mastering engineer can be viewed as an indicator or yardstick, giving valuable feedback from an informed viewpoint. He can act as an initial "litmus test," giving an insight into the potential of a record based on the 100s of records he's pre-mastered.

"If an engineer you trust says something is good then you know it's good and the record stands a pretty high chance of doing well, which makes you feel really satisfied," remarks John Leckie. "He acts as a kind of gauge and whether it's a positive or negative response, you leave the mastering room with a pretty good idea of the record's chances."

Producer Robin Millar (Randy Crawford, Big Country, Sade, Black, Malcolm McLaren) believes strongly in the mastering engineer's ability to forecast. "The experienced mastering engineer acts as an industry pundit. He is in a unique position to predict trends and I rely on him to transmit information to me on an ongoing basis. I would never make a trip to a mastering studio without asking what's cooking in the pot.

"He's a kind of barometer of media activity in the future," continues Millar, "a competitive pundit providing you with vital information to the point where if he wheels round in his chair and says this isn't a single, you'd better listen very carefully because he knows what you're competing with and knows exactly the profile that makes a record a hit or a flop."

In this respect Bernie Grundman refers to mastering as "the sobering experience of the business." "For some



producers, it will actually be the first time they really know how something sounds," he says. "So a good mastering engineer should act as a constant in their lives: giving them an accurate assessment of how the record really is and how it will stand up against the competition."

The ability to see things plainly and objectively is certainly a big plus point; putting objectivity back into a project is another. Bob Ludwig gives an example. "I remember with Donald Fagen's *Nightfly*, the producer, Gary Katz, came in with the tapes which they'd been working on for a long, long time. I said, 'Well Gary how does it sound?' and he said, 'Bob, all I know right now is that it's in tune!' At that point the producer can be so caught up in the minutiae of the album that he really needs to be able to hand it over to someone who can see the whole picture — and that someone has got to have the producer's trust and confidence. How do you gain that? By really knowing your stuff.

"You may have the best ears in the world," continues Ludwig, "but if you really don't know what you're doing, clients are not going to come back to you. In a nutshell, I think what makes a great mastering engineer is the ability to hear a raw piece of tape from the studio, imagine how it could sound, and then know exactly how to achieve that sound."

Ludwig firmly believes that genetics has a part to play in all this, claiming that



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## TECHNIQUES MASTERING

the really exceptional mastering engineers are naturally gifted. "I think that, although you can train someone to do the job — and do it well — to be truly exceptional requires an innate talent and I believe you're born with that," he says.

### TOOLS OF THE TRADE

Talent and a good pair of ears are obviously critical, but what about the equipment — how important are the tools of the trade? "An engineer is only as good as his equipment, and it keeps us all in fear," states Bernie Grundman. "You have to continually check out new equipment and it's a constant battle to keep up with it, but it's essential you do because your equipment can definitely be a limitation."

Ray Staff also believes that if a mastering engineer is any good, that he or she will find out about new equipment and follow developments. "A good mastering engineer should look at the equipment and assess for himself what really sounds better — not simply assume that because someone's said it's good or it has a good label on the front that it's a good piece of gear. It's a case of continually questioning what you're doing and trying to achieve. There are a lot of questions that need to be answered and I think that getting those answers is part of what mastering is all about."

Tim Young, while agreeing that equipment and keeping abreast of developments are important, feels that the individual's approach to the job is more relevant. "Sure equipment is important, but it's what you do with it that really counts. I think that's illustrated very well here at Metropolis where Ian Cooper and I, for instance, have identical equipment. Although the gear is the same down to the very last screw, the way we work and the end results we produce are completely different."

So is individual style an important factor, and do engineers get reputations for a certain style of mastering? "I don't think it's so much to do with style," says Ray Staff, "it's more to do with getting a reputation for a certain type of music and getting pigeon-holed."

"The main thing producers are looking for at the moment is level on CD and the whole thing has gone level crazy to the point of being silly," observes Staff. "Okay it has an effect and is very much like cutting records in days gone by, but there is also the other end of the spectrum where people, although still level conscious, are looking for the dy-

namics and the quality elements. So I think depending on what you're trying to achieve there are different engineers for different jobs."

Robin Millar fully takes this view and believes there is a strong case for using different mastering engineers for different projects. In fact, he is a prime example, having used five different engineers in three different countries to remaster his last five albums projects. "I believe it's very much horses for courses," he says, "and if you're making records for a specific market, take it to the people who are working all day in that area and really understand it."

### SAVE THE PREMASTERERS

Despite their talent and the very obvious contributions they make to a record, top mastering engineers may be an endangered species. An area that worries both mastering engineers and their clients alike is the lack of understanding from many record companies about the importance of mastering and, as mentioned earlier, the increasing trend to go for the cheapest option.

"You definitely get what you pay for in this business," warns Ray Staff. "A big problem I have at the moment is people going somewhere else to compile their album to save money. The results are invariably so poor that we end up scrapping it and starting again. That's the big difference with a quality mastering engineer, they're listening at every stage to the client's work and following it right through to the end."

It will indeed be a sad day if the great mastering engineers with their unique experience, skills, and high standards are ousted by the "stack-em high sell-em cheap" brigade, particularly as DVD audio has the potential to raise the quality stakes considerably higher. The breaking down of technical and creative standards is something that the industry should be very wary of if mastering is to avoid being relegated to a glorified data copying exercise.

### SEEK AND FIND

For all the reasons outlined here, the industry should take note and realize that audio mastering is not something that any Tom, Dick or Harry can do. It's a highly sophisticated area, with real specialists who truly understand what making records is all about. But now that you know what to look for, hopefully you'll be able to find the right person to take your project to the next level.

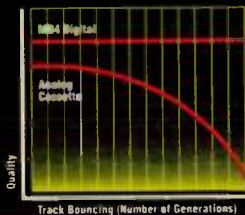


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# The Man Behind Hootie

An interview with  
producer-engineer Don  
Gehman

BY BOBBY OWSINSKI

*After producing four multiplatinum albums by John Mellencamp and records for Tracy Chapman, Brian Setzer, R.E.M., Bruce Hornsby, and Better Than Ezra, Don Gehman thought his career as a producer was over because the type of music he had recorded wasn't being signed anymore. While others in his position stayed home waiting for the phone to ring, Don dusted off his recording chops, lowered his fee, and took the added weight of engineering on his shoulders. Still riding high after selling 13-1/2 million copies of the initial major label release by Hootie & the Blowfish, Don tells us how and why he's so successfully assumed both engineering and producing duties, and gives us some insights on recording the most recent Hootie CD.*

**EQ:** Did you approach this Hootie record differently from the last one?

**Don Gehman:** Yes, quite a bit. Most of the songs for this one were recently written, whereas the last record was kind of a compilation of some recent material and some from maybe over the last six years — some of which had already been demo'ed out once before we began to record. This one was a totally different process and it took quite a bit longer. The first record took me 18 days to record. The second record we probably spent, I think, maybe two weeks of demo'ing after the writing process and then another maybe six weeks of recording off and on.

**When you say "demo'ing," how did you go about doing that?**

Basically just putting down the songs. Demo'ing and writing are kind of all rolled into one. That's kind of the way it usually works anyhow.



**HONORARY BLOWFISH:** Don Gehman helped get Hootie where they are today.

**Were you multitracking when you were demo'ing?**

Yeah. Initially we were using some ADATs down in Bermuda. Generally speaking, a song idea was brought in by maybe one or two members of the band and then they'd teach that to the other guys. Then they'd put that down on 8-track ADAT. After which we'd mix it down to a cassette that we'd give to [lead singer] Darius and then he would work on the lyrics on a 4-track Portastudio. By the time we got to San Francisco, where we were set to record, we had maybe eight things that had lyrics and then maybe another 20 things that did not. That's where the demo'ing process started to come into effect, when we realized that we just had a big mess and nothing was really finished. So

we started working through the songs until we had lyrics and an arrangement worked out. We'd put that down on 24-track in one or two takes, just to get the idea down, do a rough mix of it, and move on until we had about 30 things that were demo'ed that we could live with. Then we went to L.A. and decided to narrow it down to 13 songs. We spent some time polishing them and then I started mixing right before Christmas.

**Did that mean you took your demos and used those as basic tracks or did you re-record them?**

We re-recorded everything. But I used the whole process as a way of finding what kind of a sound I wanted for the record. I actually used that time to run through lots





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of songs to see how big I wanted things and to find the special relationships between instruments. We pretty much used the same sounds on all the different songs.

**Does that mean that the sound changed between the first and the second record?**

Yeah, substantially. We're using a lot of different kinds of equipment that I've gotten into over the last year, which I think gives them a much clearer sound than what we had before. I stopped using SSL

bus limiting and went to a Manley stereo limiter, which is, I think, a big part of the sound of the record because it's much clearer and punchier than an SSL.

A big part of my whole mixing thing are these new Tannoy MF-10's self-powered monitors. They have been the most amazing monitor speaker for me for mixing. Not the greatest for tracking, because they're so critical, but for mixing they are totally on the money. I have never come so close to a final mastered result as I have with these monitors. I also

started collecting some more microphones. I added in some Manley Gold Reference mics for overheads, which gave me a better top-end on the cymbals.

Another big difference that came along, too, was that the band actually learned so much about playing together over the last year since they probably did about 200 shows. They play so good now compared to the last record — and anyone will tell you that the real sound is in the musician's hands. I certainly felt like I improved over the year as well. We all just grew up, and because of that I think the record is better sounding from a playing angle as well as actual recording techniques. This one also used a Neve 8078 console for tracking. The last record I did on a Neve 8058, which has a slightly different equalizer.

**Do you use the same approach when getting sounds all the time, or is it unique per artist or per song?**

Well, for me, it's unique for each band. Since I produce, engineer, and mix, it's too much for me to do all together, so what I do is break things up as I set up over the first few studio days. I'll set up for every overdub I think I might do — backgrounds, percussion, different acoustic instruments. I'll put up a different fader, compressor, equalizer, microphone, whatever, and that's part of the setup for the whole album. I never changes. I never change an equalizer after the first initial day.

Then we record all the songs, and if we decide we're gonna do mandolin and conga, we just go to those microphones in those locations and play and it goes through the chain and I put it on a track. But if the next song we decide to do electric guitar and drums and bass, then those things are a whole separate setup. Therefore, if I decide we need to fix something, say two weeks after we initially record it, I can just go back and turn it on and there it is. It allows me to never think about engineering, or at least not to dwell on it. I know that it all fits together, it works and I don't need to futz with it because I'm going change my repeatability down the line.

To get into the producer side of it, my process is to record a song a day and finish it. What we do in order to make that happen is lots of times we don't do things perfectly. We rough it in, make sure that we got the right idea, and we live with it for awhile. Lots of times the rough edges are exactly what you're looking for. Maybe two weeks later you realize a certain section is kinda messed up, so it's nice to be able to

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just go back and fix it up a little after you've lived with it for awhile.

**It must be difficult for you to engineer and produce at the same time.**

I think it works better. I've always had this problem in the communication link between the band to producer to the engineer. There's a bunch of stuff that gets tied up and that usually means everyone suffers for what their real vision is. The method that I'm using now where you use the same sound for the

whole record doesn't work for everyone, but it works for me. I'm still driving the tape machine, which is good because the producer should drive the tape machine because he knows what he wants to put down. I don't really think too much about the actual engineering work. I look over and make sure the meter says it's about the right level.

During the mix, the way I set it up, I don't change the faders for every song. We're trying to keep it very simple. I think what we don't realize with our engineer-

ing is that once you get something that works you shouldn't be futzin' with it too much. Then you can really work on the production side of it. You start asking the right questions instead of trying to fix it with a sound change, or engineering fix.

**So how do you approach mixing then?**

Same deal. I usually move into the mixing studio while we still have some overdubs left, and I'll set up the same way again with a lot of the mics set up for overdubbing if we need it. Then I'll try to take the songs to the next level of what I think the mixes are going sound like. I'll spend a couple of days on my own maybe mixing one song and setting up all of the different signal chains that I want for the drums, bass, and vocals, using the different echoes I'm going to need. Then I take that mix over to my mastering engineer, Eddy Schreyer at Oasis Mastering. I'll show him what I've got in mind and I'll get his input as to how everything is sitting. This is when I usually decide what the actual size of the drums are going be, because I record big room tracks for the drums.

**Do you handle drum size via an effect?**

It's actually the way I compress room mics. I have a Fairchild 670 and then I use a couple of equalizers, pre and post to that, and then another set of peak limiters. Sometimes I'll gate them off the snare as well so that I get back-beat accentuation. I just use all of those things together to process the drums. Then when I mix I process them to get a real big, punchy, kind of Zeppelin sound that comes off those tracks.

**How many room mics do you use?**

It's usually about eight. Usually I'll use [Beyer] M 49's for miking the walls and another set of 49's close in. Then I'll use a set of [Neumann] U87's that are maybe 20 feet in front of the kick drum in an MS (mid-side stereo configuration) setup with the figure 8 out-of-phase and a cardioid down the middle. Then I just combine them all together equally into a stereo pair of tracks. While we're actually working on the record, I just monitor the Fairchild's compressing. Depending on how loud you turn them up, it varies how big the track sounds. For some of the more sensitive stuff you can turn it down a bit and back off some of the low-end drive. If I really want it bombastic, I just plug tons of low end into the limiter.

**Don't you have problems with phase cancellation with all the mics, especially the distant mics?**  
Phase cancellation is a problem when it

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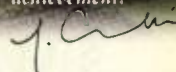



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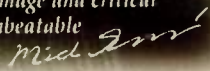
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happens within the first four feet, since that's where the wavelengths of the midrange are. All these microphones are 20-30 feet apart, so it's all totally out of phase, but that's the way reverb is. They will add and subtract, but that's what makes the sound.

**What about vocal effects? Do you usually have a standard approach or is it something unique every time?**

It depends on how much space there is. On Tracy Chapman's record, which is very open, I could use 'verbs to fill up the space on her voice. Whereas on Hootie's record, the way Darius's voice is set on top of the band does not leave a lot of space for reverb, so I don't really use any, just some real short stuff. I use a Lexicon 480 program called "Big Bottom," which just helps put a little bit of roundness on his voice. Then I just use some simple little left/right delays that are set at around 200 milliseconds to make things have some size.

**Are the delays timed to the track?**

No. Sometimes I use other delays that are timed to the track on guitars or mandolins for sparkle, depending on whether I want them heard or not. For Darius, the other big part of his sound is this microphone I have — a [Neumann] U67 that's been rebuilt by Steven Paul. It's got a 1-1/2 micron diaphragm that is very bright and impressive. And I started using this Behringer de-esser that seems to work better than the standard dbx 902.

**When you're recording your basic tracks, are you looking to capture good pieces or are you looking to capture the whole band?**

The whole band. Usually with Hootie, it's guitar, bass, drums, and maybe a lead vocal. And if not the lead vocal, then Darius will just run out and do it by himself in one take. We don't do a lot of comping. In fact, on this record I think there's only maybe two vocal repairs on the whole album. Everything else is one take from top to bottom.

Generally speaking, since these were all new songs, Darius needed to practice the song. So he would go in and lay them down one or two times; I'd do a rough mix and then we'd live with it for a few days. Then a week later he'd do two tracks on three more songs, for maybe the second time. This process over the three months that we made the record was how we got one-take vocals.

**Were there a lot of overdubs in terms of layering?**

Yeah, a lot of guitars. We typically double parts and add extra parts like percussion bits and organ parts here and there. Usually, the tracking process involved getting as much of it as you can in one run, fix it up, and then put the background parts on, do a couple of vocal overdubs, and then a rough mix.

**How long does it take you to mix?**

It averages out to about a day per song. Maybe it takes a day a song for the first three songs, then I start doing maybe two a day. Then I'll go and master the whole bunch and spend an afternoon with Eddy. From that I'll get a list of things that aren't working and I'll go back and recall the whole record with the band. On this one, the band wasn't even there for the mix. They came in after I was done and listened to the whole record and I just recalled what we needed and touched things up.

**It sounds like this record was done on one 24-track. Today that's pretty amazing that you're only using one machine. It seems like just a matter of course everybody puts up two 24-tracks.**

I stopped doing that years ago, but I'm totally against it now. It takes too much time. You're forever sitting there waiting for the machines to lock up. The level of stress is double. I find that you wind up using the space for storing stuff that you've not made a decision on, and then later it's harder to make the decision because you forget what it was all about in the first place.

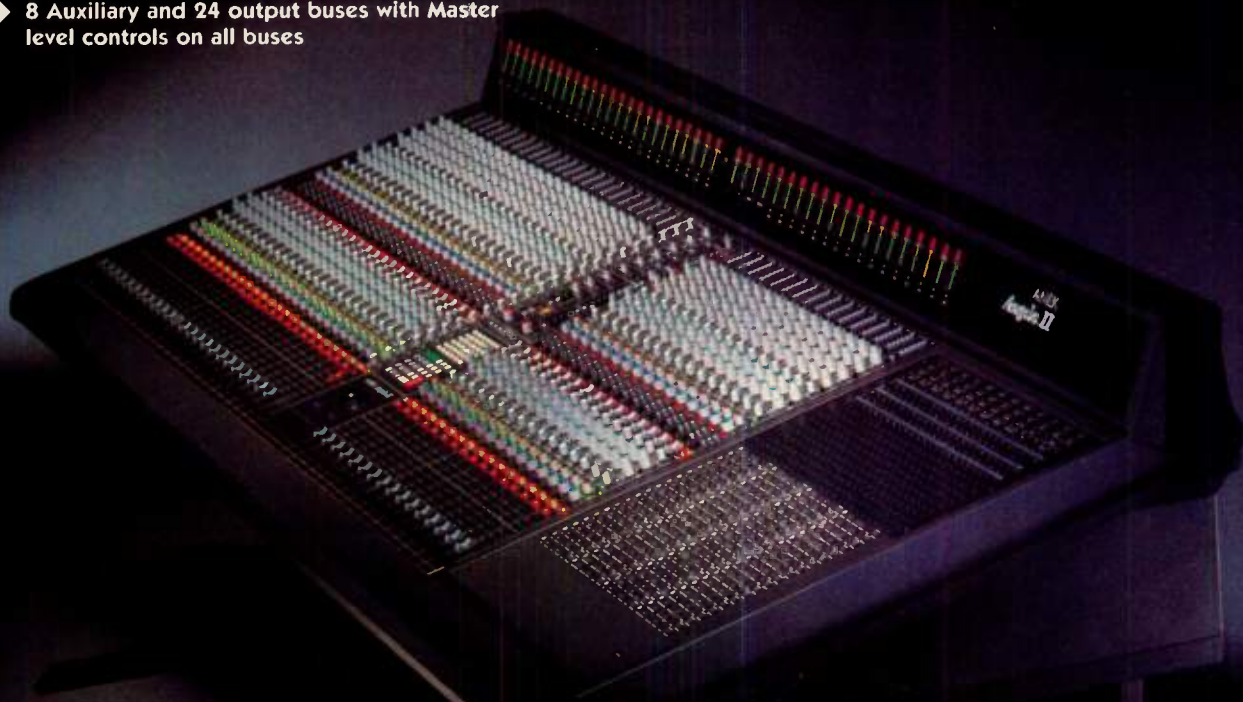
My philosophy is that I get the drums down to nine tracks, which allows me a closed sound or a distant sound. One track is for the computer, so there's 14 tracks left over for stuff. That's a lot of stuff. Two or three background tracks, one or two lead vocal tracks, four or five guitar tracks, acoustic tracks, or some keyboard tracks. You just have to know that everything on there is something that you're going to use, and if it doesn't work, you erase it and try something else. I think it forces you to make decisions along the way. Options are something that will bury you alive. You go to mix with a lot of options and you'll probably end up turning everything on and then having a hard time deciding which things to lose.

**Well, that's certainly a success story. Yeah, I was trying to show that I could make a big record inexpensively. It's exactly what I needed.**



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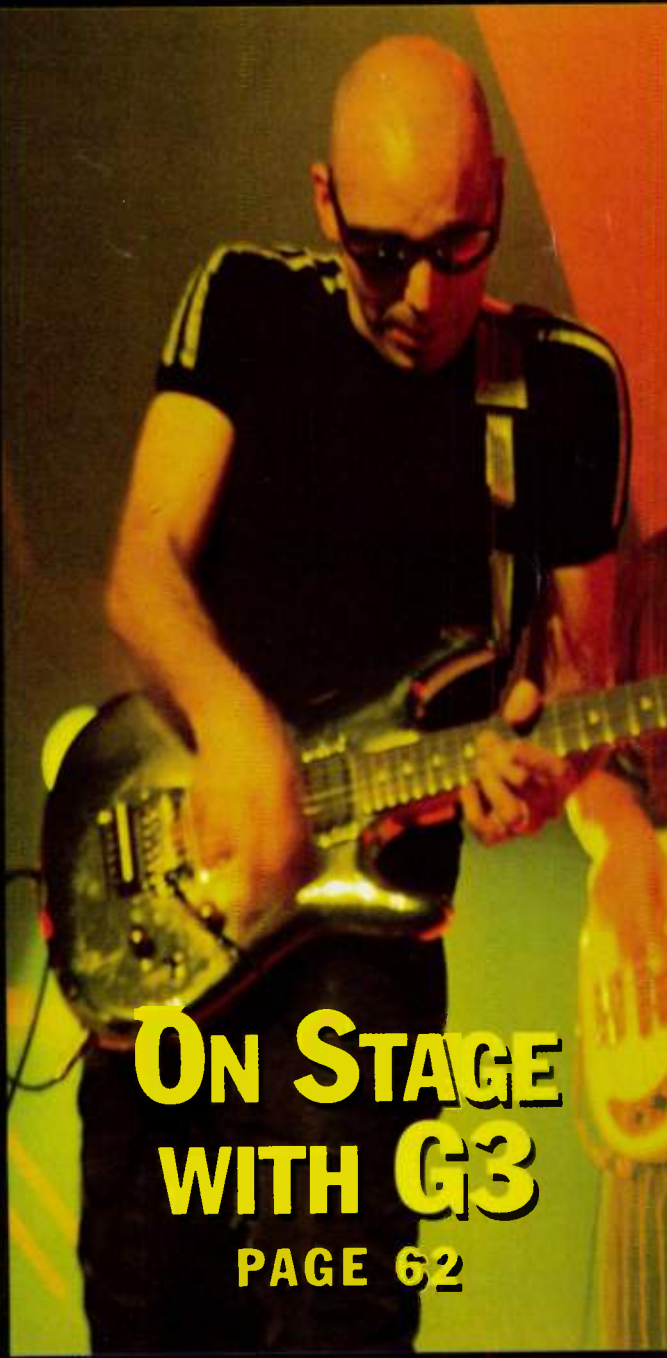


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**ON STAGE  
WITH G3**  
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**YOKO ON TOUR: PAGE 68**



**CLUB PROFILE: PAGE 82**

G3 photo by Julian Jaime

Yoko Ono photo by Mark O'Neill



# NOTHIN' BUT A G THING

**THREE OF THE WORLD'S TOP GUITARISTS TOUR TOGETHER — NO VOCALISTS ALLOWED**  
By Doug Nightwine

THE G3 TOUR is a dream for guitar lovers. It features three of the world's greatest guitarists — Steve Vai, Eric Johnson, and Joe Satriani — sharing a single stage. Each performer has a set, and then the show ends with a crowd-pleasing jam featuring all three men and Satriani's band. As Joe Satriani's tour manager and FOH engineer, I had the opportunity to not only mix Joe's sets, but also the kick-ass jams.

We started the G3 tour

on the 11th of October in Concord, California. We're carrying a pretty scaled-down production — sound, lights, and Joe's backline fit into two trucks. Showco is on the road with us, and we have 16 of their Blue cabinets, which makes up their Theater System, along with eight of their subs. It's a pretty compact package, but it's got plenty of bang for the buck. In all situations where we possibly can, we fly the PA because it gives it a better overall sound and is less labor-intensive because the Prism boxes are kind of hard to stack.

## DOUBLE OR NOTHING

We're working with two front-of-house consoles on this tour. I mix both Joe and the big jam at the end of the night with a Harrison HM-5;

this is one of the Showco consoles that they built with Harrison. It's an older board, but it's got tons of aux groups, VCAs, and stereo subgroups. The thing I like most about the console is that it's really "beefy" sounding. The mic pres are great, the headroom is phenomenal, and the overall sound is really fat and punchy.

We also have a Yamaha PM4000 with several stereo modules in it for Eric Johnson and Steve Vai's sets. They share four bass channels and a couple of keyboard channels to facilitate the number of gates and compressors that we have to carry with us. When we first planned this tour, it didn't look like we were going to have enough money for two consoles. We were originally

talking about cramming everyone onto one board.

There was a maximum of 56 inputs on the console and we had about 84 mic channels in total. We were all dreading it, but at the last minute we were able to sit back and say, "This is really stupid, we have to have another console out here."

We keep both consoles very close to each other because we are actually sharing the effects rack. Typically, we set up FOH so that we have the Harrison, the effects rack, and then the PM4000 in a row. Everybody has their own gates and some of their own compressors. The effects racks houses a Lexicon 224XL, an Eventide H3500, a TC Electronic 2290, and a Yamaha SPX1000. I use some dbx 160x compressors, some Drawmer gates, a Summit Audio 2-channel tube compressor for Joe's guitar, and the Showco Prism drive rack. The drive rack is really happening because it's a five-way system as well as a digital network, so the five bands of the system don't overlap at all. This basically gives us a 5-band parametric to tune up the system with. We use virtually no EQ on the system whatsoever. We just balance the system out at the bandwidth level and try very hard not to pull anything out of it because the system comes up sounding great anyway.

When Steve Vai and Eric Johnson are on, there's a 12-pair that comes out of the effects rack and goes into the PM4000's fan out, so it sends and returns into the effects. The output from the '4000 is dumped back into the sub-input of one of the subgroups on the Harrison, so the Harrison is the drive console. When Eric



**JAM ON A ROLL:** The end-of-night jams proved challenging, with many guests joining in.



Johnson finishes his set, they just break that 12-pair loose and plug it into the patchbay of the Harrison, and it's done. We only have one snake out here, so after Eric's set they'll also disconnect the MASS connector and change it from one console breakout to the other.

#### NO SOUNDCHECK

So far on this tour we've only done one soundcheck with Joe and his band, and that was the day before the first show. Eric Johnson and Steve Vai do a full soundcheck every day. The crew will do a basic line check, but it's pretty straightforward for me because I'm not sharing my console with anyone. Typically during soundcheck all you ever do is get your gain structure together, and our gain structure is pretty consistent. We'll run our line check during the 20-minute set change to make sure everything's working, but that's all I'm really interested in. In an empty room things sound dramatically different, and sometimes doing a soundcheck turns out to be counterproductive.

The Prism system we're carrying comes up really flat, and Brad Ervin, the systems engineer from Showco, will fire it up and make sure it's working early in the day. Sometimes, depending on the room, it's a little low-mid heavy, and typically Brad can just back some of that out of the crossovers and leave the EQ flat. When the venue fills up with people, you know what you've got to tweak pretty quick. We run the same intro tune every night, and I'm used to how that sounds. So that's three minutes of listening to the PA as it's really going to sound, which gives me the ability to see if anything's really out of whack, as well as the opportunity to make minor adjustments.

#### THE TEMPLE SATRIANI

Everybody always asks what we're doing to Joe's guitar sound. Usually people think that he's got this big rack of Eventides and all this gear in his backline, but his signal flow is very straightforward. He's got a Crybaby wah-wah pedal, a DigiTech Whammy pedal, a couple of Chandler delays, and a \$75 orange BOSS DS-1 distortion pedal.

That signal path goes straight into the clean channel of a Marshall 30th Anniversary head and we just crank it up. I stick a pair of Shure SM57's in front of his cabinet and we're off. It's not high-tech at all.

I'll run it through two channels of Summit tube compression that I'll usually have set to a medium attack with medium release, and I'll keep him in about 3 dB

of compression and crank it up to unity. Even though Joe's cabinet is a mono source, I'm using a combination of the two microphones to spread out the sound for a little more width. I'll do a little shelving on the top end and I'll put a high-pass filter on the bottom. Joe's tone is so consistent that I don't really have to do a lot of tweaking.

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**G-MEN:** (From left to right) Bernie Bernil, Doug Nightwine, Brad Ervin, and Danny Machado.

Joe only switches between two guitars that are really not that much different sonically, but in some places I'll have to shelve less of the high-end away than others. But that's about the only variance in his guitar sound. His levels are consis-

tent night after night. We'll set him up with an SPL meter at about 108 dB coming out of his cabinet from about 2 or 3 feet in front of it, and then Bernie Bernil (see sidebar) will set the balance in his wedges the same way, so if he's stand-

ing midway between the wedges, it's coming at him equally from both sides.

### COAXING THE MONSTER

I've found that when mixing live sound, a lot of people end up boosting frequencies that are obnoxious in guitars, or that guitars are already rich in. A lot of people tend to accentuate the high-mids with EQ, and I find that a little offensive. You end up not being able to have the guitars as loud in the mix because they're cutting so much that it physically hurts. I like guitars really loud and I tend to mix loudly. But I try to mix *powerfully loud* so that it's really intense and has a lot of impact without ripping people's faces off.

I like to shelve the top end of the guitars. I set the

frequency center at 6 kHz, and then back it off about 3 or 4 dB. Sometimes I'll go to the middle (depending on the room and the guitars) and I'll take a little bit of a notch out anywhere between 1.6 and 2.6 kHz. As soon as you do that to the top end, it's going to sound a little thick, so then I go down to the high-pass filters, roll them up to about 125 or 130 Hz, and just get rid of everything below that point. There's not a lot of information going on guitar-wise down there anyway — nothing that's worthwhile enough to sacrifice bass and tom sounds. So by getting rid of those frequencies I can run the level all the way to zero, right up to unity gain, and it just crunches without piercing. This also lets the signal get a lot hotter in the mix.

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## HEARD ONSTAGE AT G3

**Monitor engineer Bernie Bernil explains what the stars of the G3 Tour hear on stage.**

For the G3 Tour, Showco monitor system engineer Danny Machado is taking care of monitor duties for Adrian Legg and Steve Vai. Then I take over and mix Eric Johnson and Joe Satriani. We're running a pretty straightforward mix for all the acts. Adrian Legg just wants to hear his guitar coming back. Steve Vai is pretty much a straight rock 'n' roll situation. He likes it as loud as we can get it with the small monitor rig we have out there. We've got one pair of Showco SS Hi/mid boxes and a single low-end box. For wedges, we're using Showco SRM's and it's working out quite nicely so far.

Every now and again I have to have a talk with Steve Vai just to kind of pull the reins a little bit just so they don't get too loud — we've already blown a couple of 'twelves in the SRM's. To get Steve Vai's voice as loud as he wants, I picked up a 5-band parametric EQ built by Ian Richardson. These have a built-in limiter and it's a real sweet device. I managed to get Joe's vocals loud enough for him with just a slight cut in the 4 kHz region.

With Eric Johnson's band, it's pretty much a straight mix with no monitors for Eric. His signal comes from one of his four amplifiers because he wants to hear the tones from his guitar and he listens to the house to get the overall feel. For one song he wants a little bit in the sidefill on stage right, but other than that there's no guitar. Eric's drummer, Brendan Temple, is the only drummer using wedges. Steve's drummer, Mike Mangini, is using Future Sonics™ IEMs and Jeff Campitelli (Satriani's drummer) is using shooter's ear muffs with an old pair of Koss headphones stuck in them. So other than Vai, the stage levels are really moderate. There aren't any guitars louder than 110 dB on stage.

One thing that I've relearned on this tour is the fact that you've got to pay attention to the size of the cones that are used in the wedges. These smaller wedges are great because they're closer to the size of the speakers that Joe is using in his guitar cabinet and you can really get the tones close to it. That way he can wander around, which he really likes to do.

For Joe's guitar channels I inserted two compressors and a 31-band EQ, and I've taken out the very lows and the very highs. The compressor is set at 0 threshold with a 2:1 ratio. With Satriani, I've got devices inserted, but with guitarists that don't request it I'll recommend inserting some compression into the monitor mix because, as we well know, they'll stomp on the wrong box or something may go astray with their rig and it'll just blast. That compression will keep everybody else on stage from dying or having their ears blown out.

plex if you've got a singer because you'll have to do a little more high-mid EQ'ing. I would notch a little more heavily there depending on the vocalist's range because you've got to make room for everybody. In this situation, vocals are way down on the list of priorities, so I'm able to leave the guitar full-bandwidth with the exception of the really low and the really high tones.

Compression is also very important when mixing live guitars, but I think it's got to be the right compressor. I was fortunate enough to get my hands on some Summit Audio tube compressors for this tour and I've been running Joe's guitar signal through them. Most of Joe's guitar sounds (and guitar sounds in general) are built on distortion. There's elements in distortion that include feedback and controlled feedback, and

by having the tube compression it allows me to leave more of the top end in because it keeps it smooth. Tube compressors offer really warm and smooth sounds and can give you good compression without destroying the sound. If given the choice of going with tube compression or going with some of the other things that show up in racks (like the dbx 166), I'll forgo the compression, ride the fader a lot more, and maybe take some more high end away. The compressor helps to automate things a little more and it gets in there and really breathes and it fattens up the signal. If it's not tube though, forget it.

### START AT THE FOUNDATION

Stu Hamm is playing bass with Joe on this tour, and we've got a variety of signals running for him. We're running a clean Countryman DI

channel, his effects loop is run through another Countryman DI (so I have an effects channel for him), and we've got his Hartke rig miked with a Shure Beta 52. I'm using a well-balanced combination of the three to get his overall sound. I get most of the intelligibility out of the clean DI and I'll bring the effects up accordingly with each song. Sometimes I'll experiment when we're working with a hollow stage or boomy room and I'll throw one of the three sources out of phase to get a better sound on certain songs. It's not consistent throughout the night; sometimes I'll throw the mic out of phase or I'll throw the DI out of phase to clean it up. So instead of redoing all the low frequency EQ on all three sources, I can throw one of them out of phase and that in turn dumps a

bunch of the bottom end, which makes the signal a lot more intelligible.

For Jeff Campitelli's drum kit, we're using an Shure SM91 condenser mic in the kick drum. It's got a very fast transient response, so you don't have to do the top-end EQ and you'll only have to take out about half of the low-mid cut that you would with a dynamic. From there you can build a peak around 80 or 90 Hz. The '91 will take up to about 10 dB of that and produce a nice fat sound that won't go to shit and be all "woobie" sounding. I've got a SM57 on the snare, and I'm using AKG C414's on hihats, two for overheads, and one on the ride. I'm using Shure SM98's across the toms with the extension on them, which makes them hypercardioid and a little easier to control with my gates.

*continued on page 120*



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In today's professional project studio, you may be mixing music on Monday, cutting audio-for-video on Tuesday and spend Wednesday creating sounds and voiceovers for multimedia projects. That's why the Alesis **Point Seven Shielded Reference Monitor** is designed as the best option for all of these applications.

## Why Use A Shielded Monitor?

To your computer/video display, a speaker is a big, powerful magnet in a box. The magnetic field from typical nearfield monitors will cause your video display to become permanently damaged. To prevent this problem, we combined our newest driver/cabinet design with a proprietary, highly-effective shielding scheme. The result? The Point Seven's fully-shielded design allows it to be placed directly next to any computer or video display without causing magnetic interference.

## Great, Accurate Sound

Of course, the Point Seven's most important feature is its excellent sonic quality. We made every effort to emulate the accurate sound of our studio-standard, TEC award-winning Monitor One Reference Monitor, so the Point Seven offers a frequency response from 85Hz to 27kHz,  $\pm 3$ dB. Plus, its

ingenious dual front-ported design enables it to deliver powerful, flat low frequency response, even when positioned flush against a wall. And unlike most small speakers, the Point Seven handles high power like the big boys: 70W continuous program and 100W peaks.

## Drivers, Start Your Engines

The Point Seven's proprietary 5.25" woofer uses a unique non-woven carbon fiber cone that produces incredibly punchy bass response in spite of its small size. The all-new ferrofluid-cooled high-frequency driver is silk-domed for pure, natural response, and helps to avoid stridency and ear fatigue. Together, they create extremely accurate phase response, wide imaging and an exceptionally large sweet spot.

## Got The Point Yet?

Unlike speakers whose shielding design was an afterthought, the Point Seven was built from the ground up to provide the great sound you expect from Alesis monitors in a fully-shielded, very affordable package. If you want to get pointed in the right direction, see your Alesis Dealer and listen to the Point Seven today.

\* Alesis is a registered trademark, Point Seven and Monitor One are trademarks of Alesis Corporation.  
For more information on the Alesis Point Seven Shielded Reference Monitor, see your Alesis Dealer or call 800-5-ALESIS.

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**ALESIS**

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# "RISING" TO THE OCCASION

**YOKO ONO AND SEAN LENNON PUT ON A FASCINATING — AND TRICKY — WORLD TOUR**  
**BY JEROME FOX**

YOKO ONO IS a tremendous artist and, in the public mind, a very interesting personality. During her recent "Rising" World Tour with the band Ima (which features Sean Lennon), audiences seemed to feel that it was not just a rock concert or performance art, but really a special event. It is a treat to see someone with her history on club stages in a very intimate setting. As recording engineer and monitor mixer, the challenge for me and the rest of the crew on this tour was giving Yoko enough vocal in the monitors so that she could roam at the edge of the lighting focus and still allow Ima the space to open up and let their raw sound dictate the excitement of the performance. The "Rising" tour took us through clubs and theaters in North America, Europe, and Japan. Venues ranged in size from 500-seat clubs to 50,000+ at the Tibetan Freedom Concert in Golden Gate Park, San Francisco.

The design of the PA system was tailored around two considerations. First, the shows were all recorded simultaneously to multi-track, DAT, cassette, and (on several occasions) three-camera video. Second, Yoko and the band wanted the look and sound to be very low-tech and personal. Even though space was limited for gear in many of these club venues, we carried a full monitor rig and front-of-house electronics, consisting of two



**THE ONE AND ONO:** Yoko Ono and son Sean Lennon shine on at New York's Knitting Factory.

Midas XL-3's, signal processing, multicores, and inter-comm to keep some consistency for Yoko, the band, and the recordings.

FOH engineer Steve "Wally" Wallace had the usual club-tour nightmares of bad mix positions, suspect power, ground loops, unpredictable front-of-house cabinets, and out-of-phase drivers to keep him cheery. He used very little added ambience and gating to preserve the intimate feel. A Shure Beta 87 and a Summit limiter were used in the vocal chain to great success in keeping Yoko on top of the mix. He created a great effect of having her very present over a bashing-but-comfortable band mix.

We used these sexy little concentric monitor wedges designed by Britania Row and built by Turbosound, powered with BSS amps. Yoko ruled out personal monitors, so I had to use sidefills because she is

so dynamic and the band was generally raging about five feet behind her. The band wanted a lot of Yoko in the mixes, and she would have killed them at the top of her dynamic range — I could tell from our first rehearsals that limiting her in her mix was not going to work. So what I did was split Yoko's vocal to a second channel and compressed her to the band mixes, but not to her own monitor mixes. I did add a little ambience to her voice onstage in a couple of songs for vibe and inspiration.

They had done a few shows before I came on board and had some difficulty with the recording end. A number of people are recording by simply taking direct or preamp outputs to multiple ADATs. I chose instead to use a Mackie 32-Channel 8•Bus console for the recording inputs/outputs and four TASCAM DA-88's. In my mind, the DA-

88's are far superior with dynamic material, and you can record almost two hours of program, so the whole show was on four 8 mm cassettes. The Mackie allowed me to monitor the tape and do roughs of each show if necessary. It also gave me discrete channels for ambient and audience mics.

Since I had 32 tape tracks, I used the direct outs on the desk patched 1:1 to inputs on the tape machines. I really used the recording desk for mic preamps. This show required no bussing even though it included several channels reserved for guests who would frequently sit in. In Osaka, the entire band The Boredoms sat in for two encore numbers and I had to cram the entire five-piece band into eight inputs.

### VOCALIZING

Yoko's vocal was the most important part of the show, and the Beta 87 translated

Photo by Phillip Greenberg



# How do you improve the world's best selling power amp?

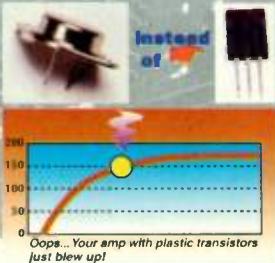
Popular wisdom says "don't change the recipe when you're making good biscuits." The reason the CS®800 has remained dominant for over twenty years is that we've only changed it a few times and when we did, we knew what to throw out and what to keep.

## What to Keep

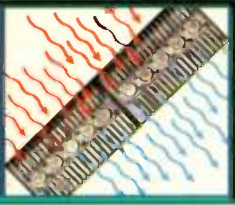
The new CS 800S uses metal (TO-3) power transistors, because plastic devices just don't deliver equivalent thermal performance.

While metal devices can be used right up to silicon junction failure, plastic devices degrade 50°C (90°F) sooner. This margin of "thermal headroom"

can be the difference between a really loud finale and something more final.



**A Parallel Flow-** The CS 800S uses a completely parallel cooling air path. Every output device receives the same cool temperature air... No device receives air pre-heated by another device, or any temperature gradient and maximum Δ T.



Books have been written about thermal management, but it all boils down to three things: air flow, heat sink area, and Δ T (the difference between the heat radiator and ambient air). The CS 800S uses a unique "parallel flow" heat sink alignment so every transistor receives the same cool temperature air for optimum Δ T.

With two variable-speed 32 CFM fans cooling hundreds of square inches of heat sink area, and metal (TO-3) power devices (in the air stream), the CS 800S will play very loud for very long (years - not minutes or seconds).

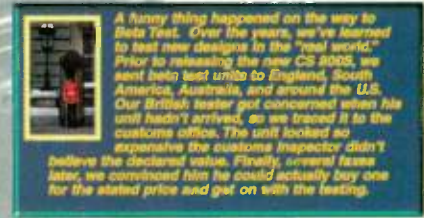
The audio amplifier section uses proven Class A/B ultra-linear complementary topology with several improvements that further reduce the distortion/noise floor even lower than the already "audiophile quality" CS® 800X (40 v/μsec, <0.03 % thd, etc.)

# Very carefully!

Our exclusive output circuit design (patents pending) completely compensates for amplifier output impedance. We conservatively spec damping factor at 1000 but it is only limited by component tolerance.

Modular inputs and outputs provide flexibility in configuring the CS 800S for your application. Binding post, or Speakon® outputs, it's your call. A clever input circuit accepts anything from XLR balanced line level signals to single-ended speaker level signals. Caution: don't try this with a non-CS amplifier; speaker level input signals will fry most amps on the market today!

**DDT™** - A fast-acting limiter, triggered by clipping or current limiting, which prevents speaker/equipment damage, is probably our most copied feature. Only Peavey Electronics offers "true" DDT. (U.S. Patent #4,318,053)



## What to Change

The new CS 800S is two rack spaces high and weighs only 23.5 lbs! The CS800S wasn't lightened by using a smaller power transformer and fewer output devices on a "trick" heat sink. We used our years of digital and "switchmode" experience to develop an advanced high frequency power supply. More than just a replacement for the old heavy iron transformer, intelligent load and thermal sensing dynamically interact to provide more power, longer, and more reliably than previous approaches.

This, combined with our more than 30 years of experience building the most reliable solid-state amplifiers in the world, allowed us to redesign the whole amplifier from input to output, merging the best of the old with the best of the new to deliver 1,200 watts of superior performance without breaking your back or your pocketbook. The CS800 just keeps getting better!

# 1200 W 23.5 lbs.



# CS® 800S

# PEAVEY



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very nicely to tape. As a back-up precaution I split her mic to two channels on the Mackie at different levels to cover the dynamics of spoken parts vs. screaming parts. The louder track got a little 2:1 compression via dbx 160A as overload protection. The lower end of the TASCAM DA-88's dynamic range was very good, however, and I still had good signal level on the softer parts. The band was set up very tightly without risers and set pieces. For the recording end, this worked out very nicely. I always prefer that the inevitable leakage is tight and contributes to the cohesiveness of the event rather than be a distraction. This leakage was always in my mind when I was wearing my monitor engineer's hat. I wanted the

ambient sound at each band member's position to really have a full perspective behind the individual sources that they needed for cues.

In pursuit of capturing the ambience and a stereo image on stage, I chose a pair of these little Reslo ribbon mics from 1961, set at snare height, four feet behind the drums. The Reslo's worked fantastic in a variety of ways. First, ribbons are the most direct transducers, so even though they have a lot of limitations, I think that they are the most honest and realistic type of microphone. I liked that the limited high frequency response had the effect of lowering the tone of the cymbals.

#### DRUM TALK

Drummer Timo Ellis had a '56 Slingerland kit and was



**YOKO-MOTIVE:** A Shure Beta 57 keeps Yoko's vocals on top of the mix.

using thin ride cymbals for crashes in "punk rock" form, so there were plenty of highs on the cymbals (I hate what digital does to the top end and always try to find lower tones that speak). Timo's kick was closed, and this took a little

work to make right for the house, monitors and recording. We ended up with an AKG D-112 on the rim of the front head and I mounted a Shure SM57 inside, very close to the beater. The thump off the front head was huge, and the '57

Photo by Mark O'Neill

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provided this quirky ringing snap for attack. I found that the best sound was when we drove two large nails in front of the drum into the stage to prevent the kick from moving! This method gave the best tone because of the way it coupled with the stage.

The snare got a '57 on top and an AKG C451 below. I like the '451 with a -10 dB pad underneath — it always sounds broken. We used a Sennheiser 441 on the hat. Wally hated it in the PA (and he's right), but it has so much meat and focus on tape that he let me use it for only half of my per-diem. After trying Sennheiser 421's and Shure '57's, we settled into Sennheiser 409's for the toms. We chose to use a single '451 overhead because the kit was small and I didn't want a second stereo pair along with the Reslos. The '451 gave me some brilliant highs in case I imagined this whole ribbon/digital thing.

### EVERYTHING ELSE

On everything else I made sure that we had two mics for tonal variety and as a fail-safe. The guitar amp got an SM57 and a '409. I routed Sean's keys through a little Fender Bronco amp for some quiet "tube-ness." He does this brilliant shred/distorto/organ/Big Muff/wah thing that was a little brutal direct, but I also used a direct box at the keyboard output for a little tone and note recognition. The bass got a typical treatment — a '421 on the cabinet and a direct box. I took the DI after bassist Andrew Weis's pedals because he uses distortion and a dynamic envelope. A clean bass track would have no relationship to his performance.

*continued on page 120*

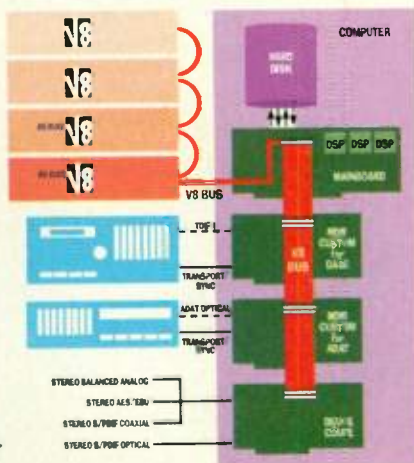


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## Under The Hood

The V8 Main Board is a virtual recording studio, including a sixteen track disk recorder, realtime automated mixing console, and an infinitely configurable routing/patching system. System I/O is handled through a variety of V8 I/O peripherals, including the 8 channel Big Block, the MDM custom ADAT interface and the Deuce Coupe stereo analog/digital interface.



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# FIRST LOOKS: HOT NEW LIVE SOUND PRODUCTS

BY STEVE LA CERRA

## JBL HLA SERIES

*JBL celebrates 50  
years in the biz  
with a unique line  
of drivers*

At the AES in Los Angeles this past November, JBL debuted a new line of touring loudspeaker enclosures called the HLA™ (Horn Loaded Array) Series. While the first two products in the HLA line are clearly aimed at the high-end touring market (the 4895 retails at \$7500, the 4897 at \$3990), driver technology born through the development of these cabinets will eventually be available in lower-priced JBL cabinet designs. JBL's engineers spent almost three years researching loudspeaker mechanics in an effort to come up with designs that are both highly efficient and lightweight. Their efforts have resulted in a new line of drivers known as DCD™ — Dual Coil Drive.

There are currently two drivers in the new DCD line: the 2254J — a 14-inch woofer (that's not a misprint) — and the 2251J, which is a 10-inch driver. Most significantly, both of these drivers are built around two magnetic gaps

(thus the name), having two separate voice coils within the same magnet structure. This allows the drivers to handle extremely high amounts of power — roughly double the typical amount. In fact, with its lightweight, 3-inch, edgewound aluminum-wire voice coil, the 2254J can handle 600 watts continuously while maintaining high efficiency and high-quality audio reproduction.

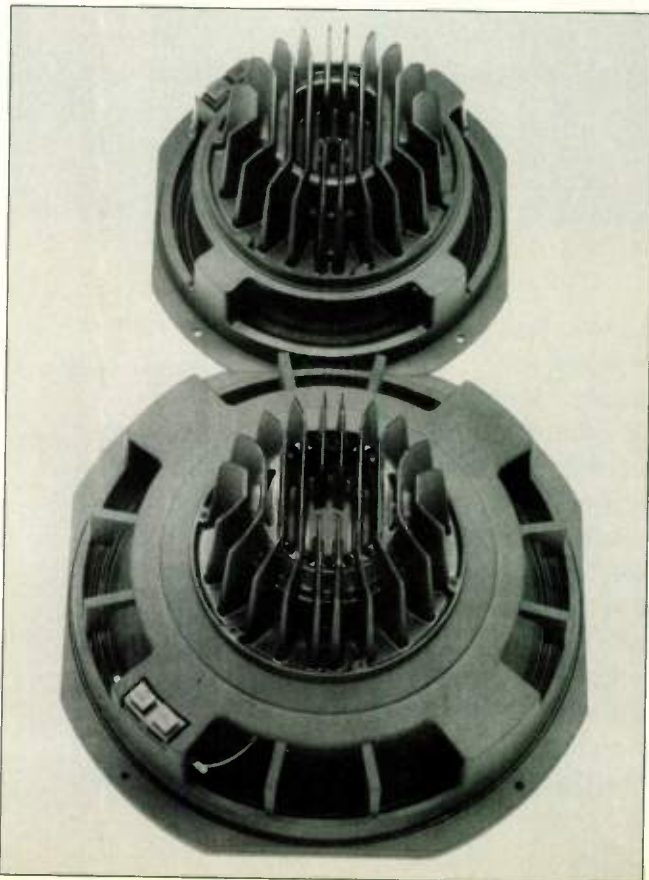
Power compression at maximum output for the 2254J is only 3 dB, enabling it to make maximum use of available amplification. Both drivers also feature a unique heat sink structure that incorporates JBL's "preferential air flow" design, which further increases driver efficiency by rapidly dissipating heat. A thermal channel running through the center of the transducer's enclosure completely exposes the driver to outside air, increasing cooling efficiency. The cone in these drivers is made from a paper and fiberglass pulp composite cone, helping the drivers produce accurate audio performance under stress.

In an effort to reduce the weight factor, JBL engineers have chosen Neodymium for the magnet material and a die-cast aluminum speaker frame. Neodymium's inherently strong magnetic properties make for an extremely lightweight driver that maintains high performance, high

power handling, and low distortion. JBL's efforts have paid off well in the weight department: the 2251J weighs in at a bantam seven pounds — about one-third the weight of a conventional driver with equivalent performance; the 2254J woofer weighs in at only ten pounds. To simultaneously hold the 2251J in one hand and a conventional 10-inch driver in the other is quite a revealing experience.

Since speaker technology with higher efficiency, lower weight and more accurate sound reproduction is something we all need, you can look forward to seeing DCD drivers in a JBL loudspeaker cabinet near you.

*For more information, contact JBL Professional, 8500 Balboa Boulevard, Northridge, CA 91329. Tel: 818-894-8550. Circle EQ free lit. #121.*





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

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Direct Out on channels 1 - 8

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2 x Pre/1 x Post or

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Full 100mm fader

PFL

### STEREO INPUTS

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15, 16, 19 & 20: Balanced jack inputs with Gain, 2 band EQ, Aux levels, Channel "ON", MIX/SUB routing, 100mm fader and PFL

## APPLICATIONS

### LIVE SOUND

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### STUDIO RECORDING

Digital and analogue multitrack (4 & 8 track), small or home studios, pre-production, video post production

### SUBMIXING

### LOCATION SOUND

## TYPICAL SPECIFICATIONS

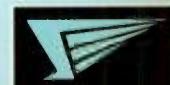
Mic EIN	-129dBu
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## PEAVEY IMPULSE 200 LOUDSPEAKERS

*Peavey debuts a take-along all-in-one PA system.*

Peavey's Impulse 200 and Impulse 200P are portable loudspeakers designed for both fixed-installation sound systems and set-it-up-tear-it-down club PA use. Built into an injection-molded, high-impact polypropylene enclosure, the Impulse 200 and its powered brother (the 200P) offer good looks, durability, and high-quality audio. In addition to having a molded-in adapter for stand mounting, Impulse 200

cabinets have top and bottom mounting point inserts that allow the box to be flown. Peavey's engineers have cleverly designed this enclosure in a trapezoidal shape so that it can be arrayed for coverage situations requiring multiple cabinets. A 90-degree x 45-degree, constant-directivity horn is built into the cabinet and coupled with Peavey's 22 XT titanium compression driver.

Inside the Impulse 200 are a number of design features that show that this box is built for serious use. A 12-inch Peavey Black Widow woofer handles bass response to a 3 dB-down point of 78 Hz. Anticipating that the Impulse 200 might be used under poor weather conditions, the woofer cone is Kevlar™-impregnated and the surround, cone, and dust cap are specially treated to be weather-re-

sistant. Road warriors take note: this driver has a field-replaceable basket so you can carry a spare and have zero downtime at the gig.

While a lot of boxes this size (roughly 24 inches tall x 18 inches wide x 14 inches deep) use a one-inch tweeter, the 22 XT is a two-inch design with response out to 18 kHz. The two-inch driver allows more controlled directivity and a longer throw than that of a one-inch driver. Power handling is rated at 300 watts continuous, with a peak input of 1200 watts, and the Impulse 200 can produce a continuous SPL of 123 dB with peaks at 133 dB.

The 22 XT is protected by Peavey's Sound Guard, which is quite an intelligent method of high-frequency driver protection. Traditionally, protection devices in loudspeakers



have been designed to be in-circuit at all times. The good news is that you're always safe, but the bad news is that even for experienced engineers who know how not to overdrive a loudspeaker, the audio signal will always be at least slightly compromised by the protection circuit. Sound Guard is only active when too much power is applied to the Impulse 200; otherwise it is

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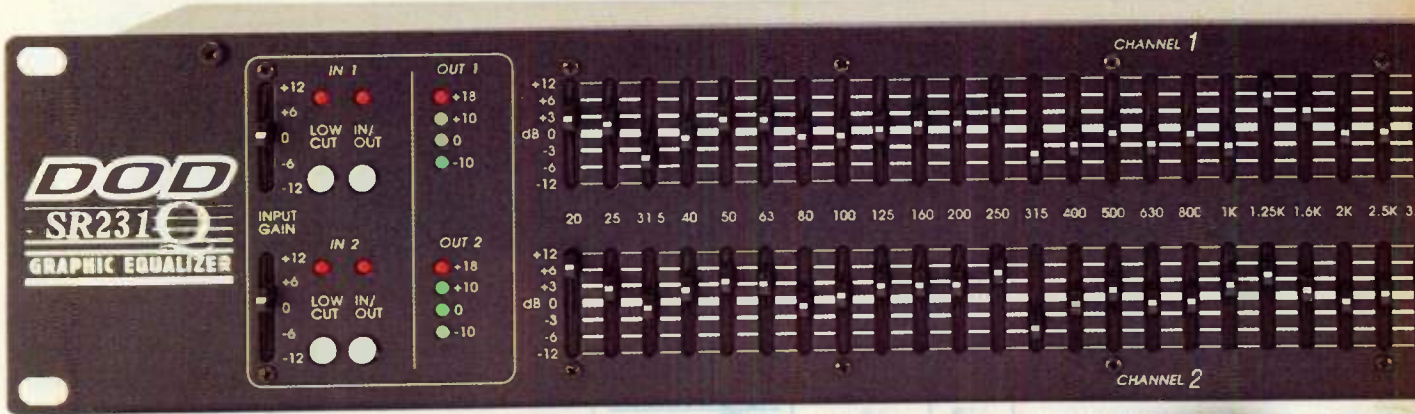
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out-of-circuit, letting the Impulse 200 provide maximum sound quality at all times.

The Impulse 200P is a bi-amplified, powered version of the loudspeaker. A 200-watt amplifier is used for the woofer and a 125-watt amplifier is used to drive the tweeter. Incorporated into the 200P's active circuitry is a bass processor that enhances low-frequency response and extends it down to 68 Hz. Line level input to the 200P is balanced or unbalanced via 1/4-inch TRS or XLR connectors and Peavey has very smartly added an additional balanced XLR microphone input. Because of this feature, all you need to add is a microphone and a cable to basically have a PA in one hand — extremely useful for small public address or "unplugged" music situations.

The Impulse 200 is now shipping at an MSRP of \$449.99; the Impulse 200P will ship in the first quarter of 1997 at an MSRP of \$679.99.

*For more information, contact Peavey Electronics Corporation, 711 A Street, Meridian, MS 39301. Tel: 601-483-5365. Circle EQ free lit. #122.*

## **QSC POWERLIGHT 8.0 AMP**

*QSC lets you carry  
even more power*

So you want some serious sonic muscle for your PA system, but you don't want to break your back carrying it around? Maybe you need a forklift. Or maybe you should look at the QSC PowerLight Series. You might recall that about a year ago, *EQ* looked at QSC's PowerLight 4.0, which (at that



time) was the largest amp in the PowerLight Series — it packed 1400 watts per channel into four ohms and weighed in at a mere 30 pounds. If you thought that was a lot of power in a compact package, meet QSC's latest child: the PowerLight 8.0 PFC. This big brute pushes the envelope of high power for professional amplifiers, packing 4000 watts per channel into 2 ohms and 8000 watts into 4 ohms in bridged mono mode. Chassis size for the 8.0 PFC is three rack spaces high and the unit weighs in at 50 pounds, achieving the highest ratio of watts-per-pound ever achieved in a pro audio power amp.

There is more to the PowerLight 8.0 PFC than just high audio output. This is the first audio amp to use PFC or "power factor correction" in its power supply. Generally, power amps draw more AC as they are called upon to produce higher and higher audio output levels. Sometimes this is not a problem, but it can be when high-powered amps tax the available AC service in an effort to crank big-time audio output.

Most existing amplifier power supplies draw power from the AC service when the AC wave reaches its highest point in the cycle. A PFC supply draws power continuously from the AC source, and QSC compares this to pushing steadily on an object rather than pounding it with your fist. As a result, PFC essentially lowers peak AC re-

quirements by as much as 40 percent, which reduces the strain on AC distribution. While this may not sound like something that affects your life, consider the possibilities of blowing a circuit breaker when powering up a PA system that puts out a few thousand watts of power. Also consider the fact that when a power amp is taxing the AC service in a club, amplifier performance suffers.

QSC didn't stop at PFC in ensuring that this new amp would be able to make use of all that muscle: the amp features line and load regulation (so that peak power capacity is unaffected by drops in AC voltage), as well as automatic AC overvoltage protection, a frequency-invariant design that doesn't care about the frequency of the incoming AC and true soft-start. Like other amps in the PowerLight Series, the capacitors in the 8.0 PFC's power supply charge more than 200,000 times per second (much faster than a conventional power supply), which is fast enough to deliver the goods when high-power, low-frequency audio signals hit the input.

Of course, all of this power supply stuff would be pretty useless in an amplifier that didn't have a well-designed audio section. QSC uses a revolutionary new N-channel MOSFET topology combined with a four-tiered DC supply to get the efficiency of a class D amplifier design with the

accuracy of a linear design (class D designs offer extremely high efficiency but don't offer high-quality audio performance). And these MOSFET output devices are operated in their most linear range to reduce distortion and noise to the lowest possible levels.

To keep the amplifier circuitry compact, QSC uses surface-mount components (SMC's) extensively throughout. Input to the PowerLight 8.0 PFC is via Neutrik Combo connectors while output is available via Speakon connectors as well as specially shrouded speaker terminals designed to handle the massive output power (four variable-speed fans help to keep the unit running cool). A data port is built into the PowerLight 8.0 PFC for interfacing the amp with QSC's MultiSignal Processors or MSPs. If you aren't already familiar with QSC's MSPs, they are controlled via PC and can perform various functions in a multiamp system, including continuous monitoring of input and output signal levels, amplifier temperature, power status, and presence of opens or shorts. QSC's PowerLight 8.0 PFC will ship in the summer of 1997.

*For more information, contact: QSC Audio, 1675 MacArthur Boulevard, Costa Mesa, CA 92626. Tel: 714-754-6175. E-mail: INFO@qscaudio.com. Web: www.qscaudio.com. Circle EQ free lit. #123.*



"Check's in the mail."

"My dog ate it."

"Use a live board for recording..."

"No such thing as a quality recording console for \$1699."

# WE WON'T INSULT YOUR INTELLIGENCE.



## Breakthrough: You Can Buy an 8-Bus Recording Console for \$1699

It's funny that some companies will try to fool you into believing that their 4-bus mixer designed for live gigs and sound reinforcement will be a great console for your personal or project studio. We know you're much smarter than that. Fact is, you can buy a quality 8-bus recording console for a lot less — from TASCAM.

## Live Boards Waste Inputs When Used for Recording

Don't depend on your salesperson to know, but for every track of your recorder, a live board wastes 1 input (8 tracks = 8 wasted inputs). Not very efficient. A true recording console, like the M1600, has dedicated ins/outs specifically for your multitrack, so all input channels remain available for necessities like guitars, keyboards, mics — whatever you need.

## No Patching and Repatching

Another thing a recording console will save you is hassling with cables. That live board has only 4 sub-masters. So, if you want to send multiple signals to any of the 8-tracks, you'll need to patch and repatch. And forget

about solving that submaster. Can't do it! With the M1600 just push buttons. It's that easy.

## Killer Mic Preamps and the Sweetest EQ

The M1600 has the EQ you need. Three bands including a semi-parametric mid sweep with more range than anything in its price class. Plus, the M1600's next-generation mic preamps are optimized for digital recording. Much cleaner and quieter than those on a live board. Check out the specs.

## Serious Monitoring. Inputs a Plenty

You'd be hard pressed to find the M1600's monitoring capability on another mixer — let alone a live board. With 6 AUX sends you can create stereo cue mixes and still have plenty of AUX power to spare. Plus, you get 4 fully assignable effects returns. Thanks to its inline design the M1600/16 gives you 32 inputs at mixdown.

## You Can Expand It, Too!

Best part is you can buy the M1600 and its optional meter bridge for about the price of a basic live board. How can TASCAM do it? By not making you pay for stuff you'd never use — like mic inputs. When was the last time you used more than 8 microphones simultaneously for recording? Chances are never. But if you ever do, you can easily expand your M1600 with the optional TASCAM MAB eight channel mic preamp — giving you 8 more killer mic preamps.

You're smart. So buy the right tool for the job. For gigs and sound reinforcement, get the live board. But for recording on a tight budget, get the TASCAM M1600. At only \$1699\* for 16-inputs; or for more bang get 24-inputs — only \$2199. You won't find a better value. Want to know more? Read the M1600 story. Call TASCAM FaxBack today. Document #6610.



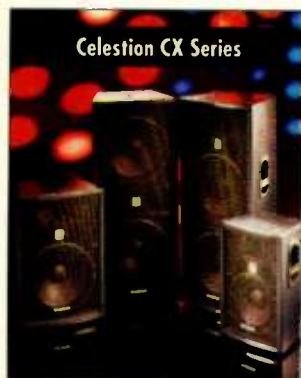
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\*16 input model gives you 32 mix positions; 24 input model gives you 48. Manufacturer's suggested list prices: \$1699 for 16 inputs and \$2199 for 24 inputs. © 1996 TEAC America, Inc., 7733 Telegraph Road, Montebello, CA 91040 (213)726-0303 • TEAC CANADA LTD., 340 Burnel Road, Mississauga, Ontario L4Z 2C2 Canada (905) 899-8002 • TEAC Mexico, S.A. de C.V., Privada de Centro #18, Colonia del Carmen Coahuacan, Mexico D.F. 04100 0115251658-1943

CIRCLE 86 ON FREE INFO CARD



# NEW GEAR FOR YOUR NEXT GIG



Celestion CX Series

## THE JOY OF CX

Utilizing an entirely new family of drivers, Celestion's CX Series is comprised of four different models — the two-way CX 1220 full-range enclosure that houses a 12-inch woofer and 250-watt power handling; the CX 1520, which offers a 15-inch woofer and an increased power handling of 300 watts; the CX 1522 with dual 15-inch woofers provides 500 watts of power handling; and the CX 1542 bass system, which offers the same power handling as the 1522 without the HF driver. Crossovers feature Poly-Switch protection circuitry and utilize second- and third-order passive networks with Mylar and polypropylene capacitors. The CX Series cabinets are constructed of 18 mm birch-ply and are finished in a rugged, textured dark gray paint. Each cabinet is equipped with eight M10 steel-reinforced flypoints, large format handles, stacking feet, 18-gauge steel grilles and 35 mm cast aluminum polemounts. For more information, contact Celestion Industries, 89 Doug Brown Way, Holliston, MA 01746. Tel: 508-429-3600. Circle EQ free lit. #124.

## MAKE A CASE OF IT

Much like their Technomad loudspeaker cabinets, Techno-



Technomad Flight Case

mad's patented Military Specification Flight Cases are a one-piece, rotationally molded design for maximum strength and reliability. Technomad flight cases meet Military Specification 810E and are ATA III rated. Impact, UV light, fire, and shotgun-blast resistant, and splinter-proof, as well as water tight when the protective lid is attached, Technomad's flight case shells are warranted for ten years and the external hardware is warranted for five years. Gasket lids keep the contents of the case free from water, salt, sand, temperature, mold, mildew, and more. Available in a vast array of shapes

and sizes in black or gray. For more details, contact Technomad Inc., 12 Elm Street, Hatfield, MA 01038. Tel: 1-800-464-7757. Circle EQ free lit. #125.

## HAVE BOARD WILL TRAVEL

Based on the design of the Folio SX, Spirit's new Folio F1 is a versatile mixer for almost any small-to-medium-scale mixing task. Available in 16/2 or 14/2 input versions with eight or six mono channels, some of the Folio F1's advanced features include 100 mm tapered faders, global +48 V phantom power supply, and three auxiliaries with Aux Masters and AFL. The F1 can accept up to 18 inputs to mix and all of the mono channels utilize Spirit's Ultra-Mic preamp, which provides up to 60 dBu of gain and a headroom of 22 dB. Mono channels also feature 3-band EQ with a sweepable mid, three auxiliaries, 18 dBu-per-octave high-pass filter, pan, mute, and PFL. The two stereo channels offer three auxiliaries with 2-band EQ, 0-22 dB rotary gain control, balance, mute, and PFL. Mono inputs accept both XLR and 1/4-inch inputs, while the stereo channels feature balanced 1/4-inch jacks, with left input doubling as a mono input. Suggested retail price on



Spirit Folio F1

the 8-mono-channel Spirit Folio F1 is \$569.95, with the 6-mono-channel version priced at \$469.95. For further information, contact Spirit by Soundcraft, Inc., 11820 Kemper Road, Auburn, CA 95603. Tel: 916-888-0488. Circle EQ free lit. #126.

## STAX THE ODDS

Cerwin-Vega's new ProStax PS-10 Series II 250 mm (10-inch) two-way loudspeaker features greater power han-



Cerwin-Vega PS-10

dling, increased efficiency, and increased woofer sensitivity (by 6 dB). The cabinet, covered in a rugged, Tolex vinyl skin, has a trapezoidal shape and curved front featuring a perforated steel protective grille, and includes three built-in ATM Fly-Ware internal braces for cabinet suspension. For more details, contact Cerwin-Vega, 555 E. Easy Street, Simi Valley, CA 93065. Tel: 805-584-9332. Circle EQ free lit. #127.

## GEM ON

Designed especially for continuous high-level sound amplification and low heat operation, Gem Sound's PA550 and PA750 power amplifiers are designed to endure non-stop use. Both



models feature fan cooling and thermal and output protection circuitry, as well as a vented front panel and rack-mountable chassis. The PA750 also features illuminated output meters. The PA750 has a power rating of 600 watts momentary peak and 300 watts continuous output power @ 4 ohms (150 watts per channel @ 8 ohms). The PA550 has a power rating of 550 watts momentary peak power and 275 watts continuous output power @ 4 ohms (135 watts per channel @ 8 ohms). For more information, contact Gem Sound Corp., 600 East 156th Street, Bronx, NY 10455. Tel: 718-292-5972. Circle EQ free lit. #128.

## How Low Can You Go?

Meyer Sound's PSW-2 is a self-powered, dual-amplified subwoofer that incorporates two 15-inch drivers to give a frequency response of 36 Hz to 120 Hz. All of the amplifier and controller electronics are contained within the 21-1/4-inch (W) x 36-inch (H) x 30-inch (D) enclosure. The PSW-2 incorporates Meyer Sound's Intelligent AC™ system that performs automatic voltage selection, EMI filtering, soft current turn-on, and surge suppression. Driver protection is optimized through TruPower™ Limiting (TPL), which allows the maximum output power of the PSW-2 to remain constant through long periods of use at sustained full power. The PSW-2 also interfaces with a Remote Monitoring System™ (RMS) network when equipped with an optional communications board. Price is \$4500/unit. For more details, contact Meyer Sound Labs, 2832 San Pablo Avenue, Berkeley, CA 94702. Tel: 510-486-1166. Circle EQ free lit. #129.

## STRIKE UP THE (FIVE) BAND

Symetrix's 551E parametric EQ incorporates five fully-overlapping bands, each allowing for a range of 10 Hz–20 kHz and independent controls for frequency, bandwidth, and boost/cut. On top of a THD+Noise of



Symetrix 551E

<0.002%, the 551E features low- and high-cut filters as well as XLR and 1/4-inch connectors. The Symetrix 551E carries both UL and CE approval. For more details,

on the 551E parametric EQ, contact Symetrix, 14926 35th Avenue West, Lynnwood, WA 98037. Tel: 206-787-3222. Circle EQ free lit. #130.

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# CLUB PROFILE: MERCURY LOUNGE

**IT MAY LOOK LIKE JUST ANOTHER CLUB, BUT NEW YORK'S MERCURY LOUNGE HOLDS SOME SURPRISES TO THOSE WHO PLAY THERE**

**BY FRANK SATURN**

WHILE AT FIRST glance the Mercury Lounge appears to be a more-or-less typical, small East Village nightclub, the accolades New York's pop music press has bestowed upon it — not to mention the impressive list of artists who make it their New York City showcase — indicate that it is anything but typical.

"The sweetest-sounding live music spot east of the Bottom Line... a magnificent sound system," raves *New York* magazine. "If you're out to hear serious music, this is the place," says Andrew Essex in his book *New York's 50 Best Nightspots*. Anybody who has been around New York City knows that compliments like these are not lightly made. In the two years the Mercury Lounge has been open, the 200-capacity performance space has seen such notables as Lou Reed,



**MERCURY RISING:** In the short time that it has been in business, the Mercury Lounge has a faithful following.

Dave Stewart and Bernie Worrell (as a group), Joan Jett, and UK Squeeze to name but a few. Pearl Jam threw a private party there with numerous celebrities in attendance and, just recently, Hootie & the Blowfish (in New York for a run of sold-out shows at Madison Square Garden) stopped by to play impromptu sets on two consecutive nights.

With so many larger venues to choose from in New York City, why do these artists venture down to the East Village to play this modest club? "It's an artist-friendly place," explains house engineer and production manager Philip Ames. "First off, the owners (Michael Wunsch and Michael Swier) wanted to design the space around musicians' needs, so they made the stage bigger (30 feet x 10 feet) than someone else might for a room this size (30 feet x 40 feet). Conventional wisdom says, 'The smaller the stage, the more room for paying customers.' But that's not the way they were thinking."

Asked about the fact that the EAW-based sound system receives a consensus "A+" from the press, fans, and artists alike, Ames modestly responds, "That could be part of the attraction, too.

A lot of bands start out playing smaller clubs and develop an intimacy with their audience. When they start to play bigger venues, that intimacy gets lost, but the quality of the gear they play through goes way up. Here we can offer them that same small-club intimacy with a top-notch sound system."

Developing a venue that not just local but national acts would want to play was always the top priority at the Mercury. "We wanted to create a place where bands felt their music was shown to best advantage and where the audience would enjoy that same great quality," says Swier. "A lot of work went into the way the music room was built." Swier and company gutted the first floor space (which had previously housed a tombstone supplier) and called in architect Brian Swier (Michael's brother) to de-



**UNDERCOVER SUB:** The left stage monitor (an EAW SM200) sits on an extension of the stage that covers the stage-left sub (an EAW SB20).



# SONIC EXCITEMENT



Introducing the world's first tube psychoacoustic frequency processor, the Bellari RP562 Tube Sonic Exciter.

## WHAT IS A SONIC EXCITER, AND WHY USE TUBES?

The frequency range that a human ear can detect is roughly 20Hz to 20kHz. However, the frequency response a normal speaker can effectively reproduce is much, much less. Additionally, speakers add distortion and phase changes that make the sound different from that of the original material.

A sonic exciter restores clarity and presence to the processed signal by correcting phase changes and harmonic structure differences. In other words, it puts the components of the sound back where they belong.

Using a vacuum tube circuit in this configuration not only restores the clarity lost in previous processes, it adds warmth and a slightly compressed attribute to the program material. This addition to the sonic excitement process makes the final sound even larger, cleaner, and clearer.

All of this magic is done by the use of all-pass filtering frequency compensated gain adjustment, and frequency compensated domain delay. What this means to you is the elements of your sound are fanned out like a deck of cards, making each sound more audible and distinct, reducing the need for high volume and radical equalizer adjustment.

## Plus, check out these other popular Bellari products -

The RP220 Dual Tube Mic Preamp is the most popular tube mic preamp in the world. It's warm pristine characteristics make vocals pop to the front of a mix, thicken up acoustic guitars, and more. All for only \$500 retail.

The RP282 Dual Tube Compressor/Limiter also adds warmth and softness to any program material, while adding just the right amount of compression. It's got all the right features like side chaining, stereo linking, and input/output/gain reduction metering. The price, only \$600 retail.

The MP110 DIRECT DRIVE is a little single channel tube mic preamp. It has a high quality input transformer, variable gain and output level controls, +48 volt phantom power, 20 dB input pad, and phase reverse. It also has a little price - \$230 retail.

For impedance matching, recording direct, running an instrument direct to a mixing board, or for warming up a digital mix, we recommend the ADB3 Stereo Active Direct Box. It has two channels, each with a ground lift, +/-20 dB of gain, a 20 dB pad, and transformer coupled XLR outputs. Only \$200 retail.

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**LOUNGE LIZARD:** Production manager Philip Ames at mix position.

sign the club. A 30-foot, antique wooden bar brought in for the front room creates an amiable tavern setting. Massive, double-pane glass and oak doors separate the bar from the music room physically and acoustically. Heavy red-velvet draperies complete the effect.

Wunsch and Swier then took the unusual step of asking recording studio designer

Jim Falconer to create an acoustical design for the music room before specifying any audio gear. "My goal with the Mercury Lounge was to create a neutral acoustical environment that would allow for a broad spectrum of musical styles to be presented," says Falconer.

"The primary challenge was the low ceiling," he continues, "which can't be

more than 8 feet above the stage and about 11 feet above the floor. Very early mid- and high-frequency reflections from the ceiling can obliterate the localization of acoustical sources, creating a monophonic sound as opposed to a stage-right/stage-left effect. In an intimate space, not only the main system arrays but also the on-stage amps need to be localized to give that live music feel, so we installed acoustical treatments on the ceilings that are effective down to about 1 kHz. That eliminated the cacophony so well that we chose to leave the side walls bare-brick to let the left/right reflections accentuate the stereo effects.

"Because the ceiling is so close to the stage floor," Falconer continues, "the subwoofers (which were to be built into the stage), the instrument amps, and the floor wedges would all have been in competition. To minimize that we acoustically treated the back wall and had four tons of sand poured beneath the staging. As it stands now, there is absorption above, below, and behind the stage."

"Because of the work that Jim did on the stage and the ceiling," says Ames, "you don't get a lot of reverberation. The room is a little splashy at soundcheck, but once the people come in to absorb the sound, those problems disappear."

Thanks to the intelligently designed room, sound system designer Matthew Kasha found that he could specify a deceptively small PA system, and he selected loudspeakers from Eastern Acoustic Works. The main house system consists of three EAW JF200 nearfield systems hung from pillars on each side of the stage and two SB250 subwoofers built into the front of the stage. "Actually, the JF200's have given us every-



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● "I just sold my Mackie 8-bus and purchased the new Ghost console. The difference is amazing. The Ghost is the warmest sounding board I've ever used."  
- Mike Perkin (The Lab Recording Studio, Emmaus, Pa)

● "I replaced a console that was more than 3 times the price, and got a quieter, more transparent, and sweeter sounding console! Big console feel, with an amazing price!" - Kurt Bevers, Brownell Sound, Oregon.

● "An incredibly musical console, ultra flexible with a real usable EQ. It is absolutely the best sounding project studio board that I've heard". - Howard Givens, Spotted Peccary Studios."

● "I love the desk, the EQ is just marvellous. Ghost is the best 8 bus recording desk on the market." - Lee Hamblin, Engineer.

● "Intuitive handling, flexible routing, great Soundcraft sound."  
- Melvin Fernandes, Recording Engineer, CMI Studios, India.

● "I use the Ghost for several radio shows doing live performances. The EQ is amazing, I'm on air in 5 minutes! Doing dance stuff is one, doing live stuff is another. But I use only one board for both of them, The Soundcraft Ghost." - Barney Broomer, Sonic One Rotterdam.

● "Ease of operation and the numerous in-line inputs for my synthesizers and samplers is why I purchased the Soundcraft Ghost console."  
- says President of Caban Entertainment and producer of Mighty Morphin Power Rangers Shuki Levy.

● "I didn't know how useful mute groups could be and how good the EQ had to be until we used the Soundcraft Ghost." - Stefaan Windey, La Linea Musicproductions b.v.b.a., Belgium.

● "It sounds great and the EQ is very precise which makes it very easy to pin-point the frequencies I need to work on. Ghost enables me to finish mixes on the console at home, without having to use any other studio." - Phil Kelsey (Remix Engineer)

● "The console is very user-friendly and is constructed so well that it can easily withstand the rigors of even the most hectic of production schedules."  
- Corey Dissin, Producer at Paul Turner Productions.

● "Both myself and our Production Director Jeff Thomas used the console for PowerStation and were equally very, very impressed. For the money, the console is fantastically versatile, has good headroom and a very impressive EQ." - Alex Lahey (Engineer for PowerStation)

# Ghost

"Let us know what you think about the Soundcraft Ghost by visiting our web site at <http://www.soundcraft.com> or via e-mail to [info@soundcraft.com](mailto:info@soundcraft.com)"

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thing we wanted," says Kasha. "They develop impressive peak SPLs without breaking up or sounding harsh and the small enclosures let us hang them from the pillars without creating sightline problems." Space considerations ruled the placement of the subwoofers. Putting them on the stage was impractical and sightline problems prevented their being hung, so the decision was made to build them into the front of the stage. Falconer's acoustical treatment of the stage prevented any under-stage reverberation and neither onstage nor audience space was sacrificed.

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The system is constantly being upgraded, as well. For example, consideration is currently being given to a system upgrade that provides sound in the front bar. "When the music room is sold-out, we ask the bands for permission to pipe a feed into the bar," says Ames. "Since it happens more and more frequently, we thought we'd take a look at what we could do to bring this system up a level. It's just another way we can show fans and artists that the Mercury Lounge is a great place to hear music."

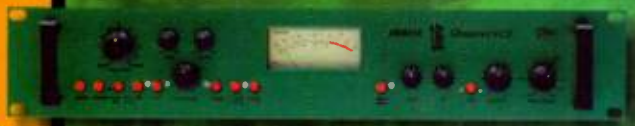


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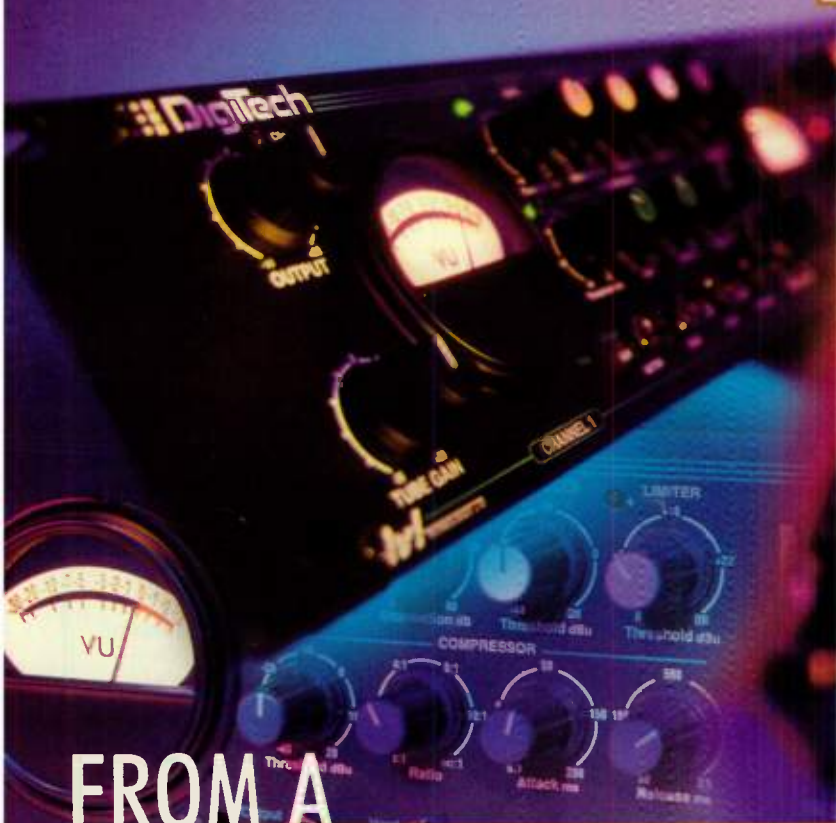
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# ALESIS NANOVERB

THE NANOVERB IS the latest in Alesis's low-end line of 1/3-rack-width, teeny-tiny boxes that started with the MicroVerb. (I guess the PicoVerb comes next, then the FemtoVerb.) The NanoVerb is cheap and cheerful, but can something at this price point be taken seriously?

## CONTROL FREQ

Controls include input level (with accompanying bicolor level LED), dry/wet mix, output level, rotary switch for selecting the 16 different presets, and an "Adjust" control that varies one parameter per patch. The five 1/4-inch rear-panel jacks are Stereo In (stereo signals are summed to mono prior to being processed, except for one chorus algorithm, which retains true stereo), Stereo Out, and Bypass. There's also a wall-wart cable connector.

Operation is simple: select the preset, tweak the input and output levels, then adjust the control to taste. The 30-page manual may seem like overkill, but it covers a plethora of interfacing options, how to avoid ground loops, and troubleshooting.

## SOUNDING OFF

Sound quality resembles the MidiVerb 4, and is surprisingly good for the price. Like other Alesis 'verbs, the sound has a more "airy" than "thick" character. Periodicity is evident on long decay tails when monitored in isolation, but in most applications it's not really noticeable. The NanoVerb is also pretty much free of the "metallic" tim-

bre found in many lower-cost boxes. Overall, the sound quality definitely belies the price.

## PERIOD OF ADJUSTMENT

The Adjust control varies decay time with reverb, LFO rate with chorus or flange,

is limiting, nor can you adjust feedback phase or amount for flanging or chorusing (flanging always uses positive feedback, and covers a relatively narrow range of short delays). But bear in mind this is a box you buy

decent reverb, and the NanoVerb helps prevent budget-busting. Interestingly, this box also seems targeted at guitarists. The 470k input impedance doesn't load down stock pickups, and the chorus-based effects fit guitars like a glove.

Even decent-sized studios can use an extra reverb for a dedicated effect, thus freeing up the main, expensive reverb to add overall ambience to a track.

So the bottom line is as simple as the box itself: solid sounds (including some exceptionally good halls) and a user-friendly price achieved through the

tradeoff of limited flexibility. If you're a tweeker, you'll want more. But for a no-frills reverb that concentrates on sounds rather than features, I doubt you can find anything better for the price. **EQ**



"motor speed" with the rotating speaker effect, and time in 10 ms increments (up to 1270 ms) with delay. There are two combination programs: "Chorus + Room 1" and "Chorus + Room 2" (with variable decay and delay time, respectively). Nice touches include having the rotating speaker speed "ramp" when you change speeds rapidly; also, the LFO depth increases automatically with faster chorus speeds.

Three halls, three plates, three rooms, and one "gated" reverb make it fairly easy to find an appropriate reverb character, and the adjustable decay time helps tailor the sound to your application. The halls are really quite wonderful, as are the rooms and plates. The gated reverb, however, has a distinctly "grainy" sound that I don't like.

On the minus side, not being able to adjust delay feedback for delay patches

for the reverbs; anything else is gravy.

## WHAT'S IT GOOD FOR?

Those with 4-track cassette or MiniDisc decks will sound much more professional with a

## ROAD TEST

**MANUFACTURER:** Alesis, 3630 Holdrege Ave., Los Angeles, CA 90016. Tel: 800-5-ALESIS.

**APPLICATION:** Add ambience and some time-based special effects to mono or stereo signals.

**SUMMARY:** Very good sound for the price, but limited flexibility.

**STRENGTHS:** Extremely cost-effective; compact; excellent with guitar; stereo outs; idiot-proof; effects don't go away when summed to mono

**WEAKNESSES:** Only one variable parameter per patch; having to tweak controls for different patches complicates live use; grainy-sounding gated reverb.

**PRICE:** \$179

**EQ FREE LIT. #:** 131

**BY CRAIG ANDERTON**



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# DBX 1066 & 166A PROCESSORS



## ROADTEST

**MANUFACTURER:** dbx Professional Products, 8769 South Sandy Parkway, Sandy, UT 84070. Tel: 801-568-7660.

**APPLICATION:** Analog dynamics processor.

**SUMMARY:** OverEasy® and hard-knee compressor/limiter/gate.

**STRENGTHS:** 1066 offers front panel sidechain enable and monitoring, warm sound; 166A is simple, easy-to-use, multipurpose.

**WEAKNESSES:** The two Bypass switches are far apart, a hassle when A/B'ing stereo tracks and program; release time could be faster.

**PRICE:** 1066, \$549 (\$119 for optional Jensen transformer); 166A, \$419

EQ FREE LIT. #: 132

BY EDDIE CILETTI

WHO WOULD ADMIT to having enough compressors, limiters, and gates? Certainly not the famous engineer who, so the story goes, after spending ten hours on a mix, turned around and said, "OK, I need one more compressor for the mix bus. Whaddya got?" The assistant sheepishly replied with the universal, hands-up signal meaning that the guy had basically cleaned out the store.

dbx has always made affordable products, and, now, the list price for the Model 166A has been dropped (\$549 to \$419) to make room for the Model 1066 (\$549), a recent addition with more features and improved sonic performance. (The original 166 had unbalanced inputs and outputs. The "A" version is balanced and has gold-plated, XLR connectors.) The 1066 uses an improved VCA (the V2, which has less noise and lower distortion) and

provides additional metering, front-panel sidechain enable and an optional output transformer. For easy comparison, Table 1 displays the significant differences.

### MOVE CLOSER, HONEY

One hard-to-measure spec becomes immediately obvious upon listening: the 1066 is much warmer — much closer to the original signal — when compared to the 166A. I set the controls of both units to the same positions: Threshold: -20; Ratio: 3-to-1; OverEasy: On; Contour: On. The processing was similar, but the 1066 is a thumbs-up improvement.

*Note:* The exceptions to the settings, of course, were attack and release (1066 only), which were at the slowest and fastest rates, respectively. The 166A has a Mode switch that slows the response time when engaged. The 1066 also has an Auto switch that disables Attack and Release to help get you started. When used to process stereo tracks, it

would be great if the Bypass switches on both units were closer together. (My left hand feels like it's been practicing bass from doing so many In/Out comparisons!) Optimal performance is obtained by setting the threshold so that all three (green, yellow, and red) threshold LEDs are toggling to program.

### STEREO VS. DUAL-MONO

You may find, as I did, that OverEasy is better suited to program, while hard-knee — too radical for that task — is appropriate for individual tracks such as guitars, bass, or vocals.

There are an infinite number of options when compressing a mix. One semi-radical method is to insert the compressor into the mix bus at the beginning

TABLE 1

	dbx 166A	dbx 1066
VCA	2159	V2
Sidechain Enable	via rear-panel jack normal	front-panel switch
Sidechain Monitor	no	yes
Sidechain Connector(s)	Single TRS input-only jack	Separate Send and Return jacks
Line Voltage Selector	no	yes
Gold-Plated XLR Connectors	yes	yes
Auto	no	yes
"Slow" Mode switch	yes	no
Attack and Release Controls	no	yes
Metering	gain reduction, peak stop, threshold, gate	gain reduction, peak stop, threshold, gate, input/output
Depth	5.75 inches	7.75 inches
Operating Level	+4 dBu only	+4 dBu/-10 dBV via rear-panel switch
Bypass	Full, via Switch	Full, via Relay
Contour (bass roll-off for the detector)	One switch for both channels	Two independent switches
Output Options	N/A	Jensen Transformer \$119
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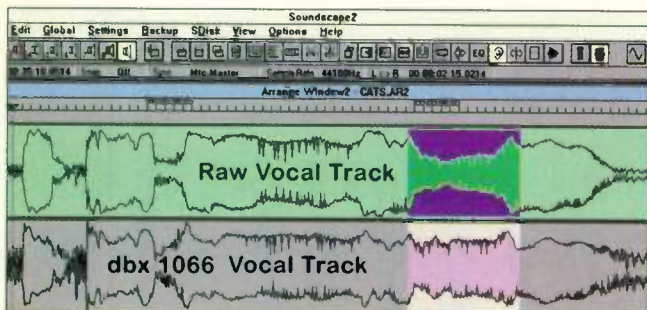


FIGURE 1

of the session and mix to it. (Do a quick test to determine whether OverEasy or hard-knee is better suited.) You will find out right away that certain EQ settings on punch-critical drums and bass will either enhance or upset the delicate balance required for exaggerated compression (the type you like to hear).

This method will approximate the large sound of Mrs. Kravitz from *Be-witched...er*, uhm, I mean

like Lenny Kravitz imitating The Beatles. Yeah, that's it. The sound of some of those recordings is due in part to a vintage Fairchild vacuum tube compressor. (The

Fairchild, by the way, was designed for mastering vinyl. It can process the "lateral" — left plus right — information separately from "vertical" — left minus right.)

An alternative to that style of mixing requires more precise balances before adding compression. For example, projects mixed on a workstation or traditional automation will yield a nearly finished product. The OverEasy mode on the 1066 will gently smooth the peaks and enhance the

space. The 1066 also has an AutoDynamic™ attack and release characteristic that, when using the slowest attack setting, does seem to make the release time (which was set as fast as possible) slower than I would have liked — almost too smooth. (See Table 2 for mix and vocal settings.)

Table 2 shows the settings for vocals are far more radical (faster attack, higher ratio, hard knee) and forgiving than the mix settings. To make matters more compli-

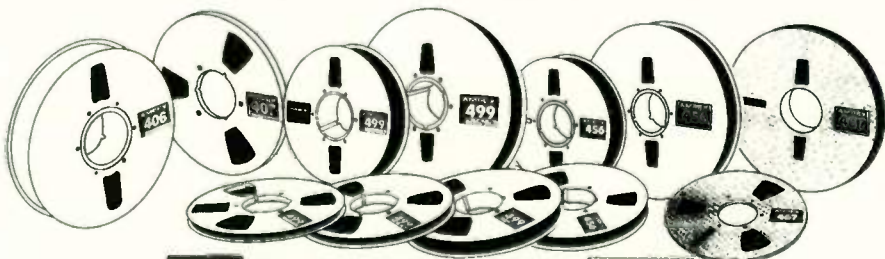
TABLE 2

1066 Settings	For Program/Mix Bus	For Vocals
Ratio	2.5:1	6:1
Attack	.04 dB/ms (slowest)	1 dB/ms (nearly fastest)
Release	250 dB/ms (fastest)	250 dB/ms (fastest)
Contour	On	Off
Knee	Over Easy	Hard
Stereo Couple	On	Off

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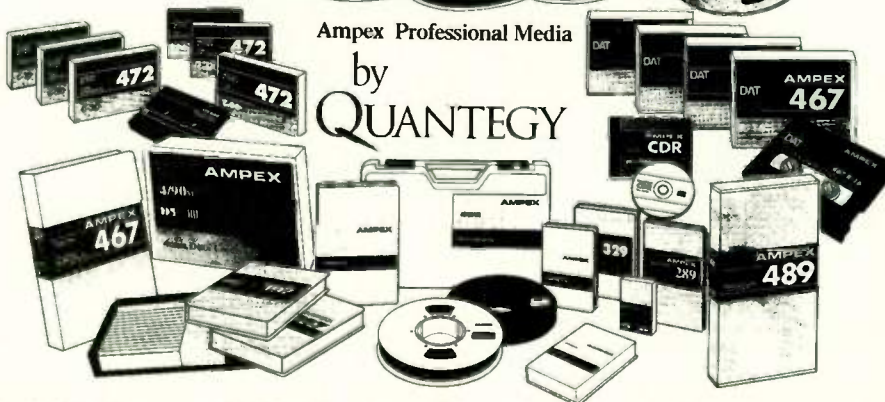
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dbx 166A compressor/limiter

cated, the track I had been mixing survived 18 years on a piece of 2-inch that was suffering from the dreaded "tape-shed" disease. (I'm getting mighty good at baking!) It seems the vocal track, which ended up too close to the tape's edge, suffered the most. The lovely screen-capture (fig. 1), courtesy of the Soundscape workstation, shows the "before" up top while the "after" is below. The highlighted area was not a drop-out, but a major level dip that improved after compressing.

The challenge, as always, is for the vocals to lay perfectly on top of the track — not lost, but not damaging to the environment either. I really squashed the vocal track (adding a touch of the Aardscape True Analog box to subtly add a little "edge") and then pulled an old trick from my Record Plant studio days by mixing this signal with the original. (I also inverted the phase and played with the timing.) The end result worked out very well. Be creative when working with processors!

**SIDECHAIN AND CONTOUR**

If you are struggling with vocals in a mix, the sidechain feature can be a life saver. The 166A has this feature, but, unfortunately, a cable plugged into the sidechain *insert* connector will disable normal functionality. This inconvenience was resolved in the 1066, which has both Sidechain Enable and Monitor switches on the front panel.

The typical problem with vocals is what to do with an EQ setting that adds air during a soft passage but rips ear drums in a powerful

*continued on page 136*

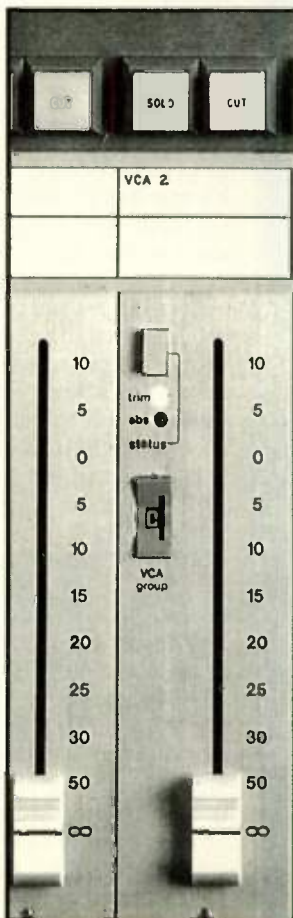
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EQ JANUARY 93



# QUASIMIDI RAVEN SYNTHESIZER

DURING LAST YEAR'S Winter NAMM, I raved about a new synth from Germany. I kept saying to people, "Well, I've just gotta tell you about this new synth. It's called the Raven, and I've never seen or heard anything like it!" Upon hearing this, most of the folks would look blankly at me and respond with something like: "So, uh, really?...Well, see ya."

Undaunted, I continued to totally lose it over this radical new synth, and



## ROADTEST

**MANUFACTURER:** QUASIMIDI Musikelektronik, GmbH, Eisenbahnstr. 13, Kirchhain, Germany D-35274. Tel: +49 6422 9402 24. US Distributor: Radikal Technologies, 1119 N. Wilson Avenue, Teaneck, NJ 07666. Tel. 201-836-5116.

**APPLICATION:** A factory- and user-programmed sequencer groove-type synthesizer totally at home in the studio, on-stage, or in the DJ booth.

**SUMMARY:** A 16-part, multitimbral synth that's especially well suited for techno and ambient music production. Includes an innovative set of preprogrammed sequencing features that lets the user easily create and control hundreds of thousands of groove patterns in real time.

**STRENGTHS:** Killer sounds; uses an incredibly innovative approach to real-time performance composition and groove sequencing; both the keyboard and the large controller wheels have a great feel.

**WEAKNESSES:** Turn down your amp before turning the Raven on, as the initial squawk won't do your ears or speakers much good; QUASIMIDI has replaced the acoustically "buzzy" internal power transformer with an external "line lump" (you know, those inline power supplies that look like a snake just swallowed a rat!), so I guess I can't complain about that anymore.

**MANUAL:** The translated manual takes a bit of getting used to, but after you've spent some time with the Raven it'll actually make more sense. Besides, there are plenty of cool pictures from Berlin's LOVE-PARADE '95. (I guess it was their most recent techno-Woodstock.)

**PRICE:** \$2195; Raven-Max expansion board (increases internal sound memory from 8 MB to 16 MB) provides 1000 new sounds, 16 drum sets, and operating system upgrade, \$395.

EQ FREE LIT. #: 133

BY DAVID MILES HUBER

after hanging out at their booth way too long, I managed to wrangle one out of them for review. Now it's time to let you know about this "bRave" new synth from QUASIMIDI.

The Raven was developed in Germany by folks who are heavily into European techno-dance. Although it's true that the Raven's design approach and sounds are definitely dance oriented, I can easily say after having had one for a while that its cool sounds and completely unique design structure cross most musical boundaries. Although it's not difficult to operate, this synth is definitely not for the musically or technically timid. Here's the deal.

### CHECK THIS LAY-OUT

In its basic configuration, the Raven comes loaded with 512 useful and high-quality PCM-ROM sounds that work in conjunction with 5-oscillator additive- and 4-operator FM sound-synthesis. Overall sonic textures are then created by mixing, editing, and processing up to four of these sounds together into a single soundpatch, which is called


a Performance. A total of 250 of these Performances are stored within five banks. The first (User-Bank) will let you program and store your own set of patches in up to 50 memory locations; while the remaining four banks, "A through D," have been pre-programmed at the factory into ROM.

Before delving into all of the innovative goodies, let's take a quick look at the Raven's control surface. To begin, all patch, pattern, and edit settings are displayed using a backlit 5/8-x 6-inch, 2-line LCD readout display. Located just below the display are four "soft" buttons and data-entry knobs that let you scroll through and select various screen software settings. To the right of the display are two large Page and Value/Tempo alpha dials that, respectively, let you scroll through the display's sub-menu pages and increment through edit values/or adjust the tempo of the Raven's internal sequencer.

Most of the Raven's performance modes can be directly accessed at the press of a single button. For example,



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selecting a button from the Edit section gives instant access to parameters relating to any instrument part, system/operating modes, and either of the Raven's two-internal effects processors. Selecting from the two Mode buttons transforms the keyboard from a standard performance keyboard to a set of trigger keys for initiating various on-board sequencer functions (more on this incredible feature in a moment). A Tap button has been added so that you can set the Raven's sequencer tempo by manually tapping out quarter notes or by adjusting the speed using the Value/Tempo dial.

In the Performance mode, any of the Raven's 250 sound patches can be directly accessed by first calling up the desired bank-set (each containing ten patches) and then pressing the desired patch button (0-9). Finally, performance parameters can be varied in real time using aftertouch, a large pitch-bend wheel, two assignable controller wheels, and an assignable footswitch jack.

#### HOW DOES IT SOUND?

The ambient pads produced by the Raven are some of the best I've ever heard — extremely lush and rich. Most of the splits and basic textures have been programmed with a great deal of attention to detail. Just to give a quick example, each time you play a single key on a light, yet texturally rich patch called "Babybox," the sound's attack and character changes, giving a striking realism and depth to what otherwise might be just another "tinkle-patch." The analog sounds are totally "in your face" and realistic. All of the bass, guitar, organ, and analog sounds also are great. Plus, if you're into Moog-type beef, you'll be in 7th-heaven as the

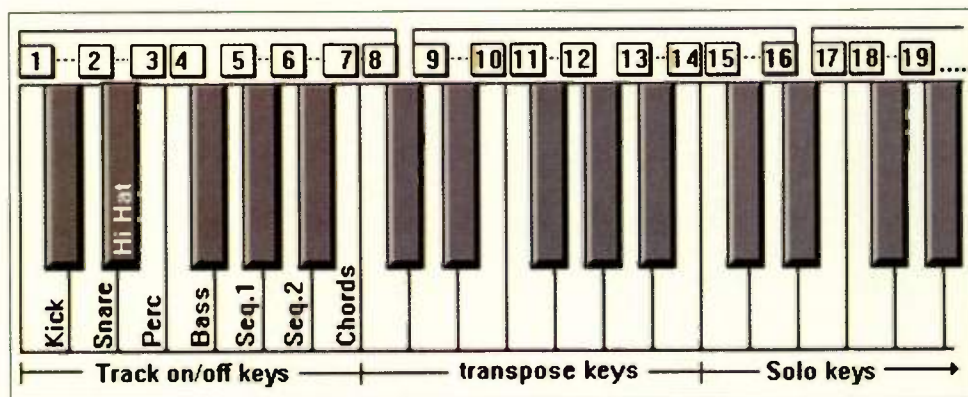


FIGURE 1

sounds and real-time modulations are truly reminiscent of the real thing.

#### LET'S GET MOTIVATED

In addition to generating great sounds and effects, the Raven's expressiveness can be further enhanced by kicking in an innovative and totally wild real-time effect called the Motivator. The Motivator is a sequence function that has been added to act as a trigger for arpeggiating and repeating notes at the selected tempo rate. Often cool, real-time wave-sequences are created whenever the motivated notes are arpeggiated. Just play a new riff and the Motivator will begin a whole new wave-sequence.

Notes can also be repeated in a number of programmatic ways. For example, full chords can be repeated, effected using an interesting gate function, given 8th- or 16th-note hold values, toggled or doubled up/down an octave, and mixed with varying degrees of depth. The Motivator's sequence pattern can even be driven by any of the eight sequenced instrument tracks. I could talk about this effect on paper 'til I got blue in the face, but you've must hear it in person in order to fully appreciate how radical the Motivator is. Oh, by the way, this function can be routed to the

Raven's MIDI out, meaning that it can be used to trigger any MIDI toy in the house. It'll even make sounds you've grown totally tired of sound fresh, wacky, and intriguing. I also found it to be a serious tool for creating off-the-cuff sequenced rhythms.

As though the Motivator function weren't enough, QUASIMIDI threw in an on-board, real-time pattern sequencer that acts like no other sequencer I've ever seen. The Raven's sequencer is comprised of eight tracks that are dedicated to a specific instrument/sound type (kick drum, snare, hihat, percussion, bass melody, melody 1, melody 2, and chord track). (See fig. 1.) Each of these tracks is able to play 400 sequences (called Motives). These instrument Motives can be synchronously combined to create millions of possible grooves (mostly in an ambient or techno style).

Once the pattern sequencer is running, all that's needed to create any number of patterns is to press any of the eight Track buttons that relate to an instrument or melody line that you want to change at the next measure boundary. No joke — it's that easy. In addition, when in the Sequencer mode, the first seven white keys (C1-B1) and the D#1 key are used to turn the individual motive tracks

on/off. The keys an octave above this (C2-B2) are used to transpose the groove pattern in real time. The notes immediately above C3 are reserved for a solo instrument that can be played along with the sequence. Once you've chained the grooves into a song that you like, you can Mute and Transpose the instrument tracks, tweak instrument levels, save the song to any of 10 memory locations, and then dump it to tape or disk at a later time.

It took a bit of fancy fingerwork on my part, but I even figured out how to patch the pattern sequencer through to the MIDI out. Even though I couldn't get the Mute, Transpose, and Sequence change buttons to respond, the effect was totally wild when heard through a number of my other MIDI boxes. Listening to the pattern dances while shifting through various sound patches left me speechless.

#### RAVE-ON

I fell in love with this "bRave," new synth at first sight. and I'm still amazed at its sound quality, innovative features, and great tactile feel. I strongly advise that you do yourself a serious favor and check this German high-flyer out. It's a synthesizer that definitely has to be experienced first-hand to be believed.



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CIRCLE 12 ON FREE INFO CARD





# Tannoy PS 115 Powered Subwoofer

This stripped-down version of the AMS 210A may be enough to add more boom to your room

BY WADE MCGREGOR

Many recording control rooms, both big and small, have forsaken big monitors for a trusty set of nearfields to track and mix music. Nonetheless, there remains one problem: nearfields simply are not big enough to really make big wavelengths happen at higher listening levels. Nearfield monitors may have a quoted response down to 40 Hz, but these frequencies are produced with some artifacts. If small monitors start producing those chest-thumping physical effects, they are usually also producing overtones that are not in the recording. If you want to monitor the bottom two octaves of the audio band, get serious: get a subwoofer.

Tannoy's AMS 210A active subwoofer is for those who need to match their high-end nearfield monitor to a no-compromise unit (see my review in the June 1996 issue of *EQ*). Tannoy realizes that not everyone can afford that level of sophistication, and so they developed the no-frills, all bass, PS 115 subwoofer. Powered by a simple and straightforward 100-watt RMS amplifier, it can produce peaks up to 114 dB SPL. The stiff 15-inch driver is firmly mounted in an 18-inch H x 20-inch W x 20-inch D (450 mm x 500 mm x 500 mm) cabinet that includes the power amplifier and active crossover. The crossover will accept the output from your mixer or monitor EQ and pass along the high-pass filtered signal to your nearfield loudspeaker amp. Assuming you have a few RCA connecting cables, you can have the unit added into your system in a few minutes.

The active crossover provides an

80-Hz high-pass filter to remove the low frequencies from your full-range nearfields; thereby reducing the sounds of stress and distortion from their output. A variable frequency control allows you to tune the response of the PS 115 to match the output of your nearfields as they begin to produce sound above this 80 Hz range. The frequency response characteristics of your nearfield's drivers and cabinet design vary the way they behave as they crossover into the subbass unit. The variable frequency of the sub's high-end cut off (50 Hz to 130 Hz) allows this transition to be fine tuned. This is the most delicate aspect of setting up the PS 115 (or any subwoofer) as it is easy to set the subwoofer too loud (relative to your nearfields) now that the low-frequency quality has been so dramatically improved.

The best set-up method I have found is to use a series of stepped tones from 20 Hz to 800 Hz (as on the

Prosonus *SRD Studio Reference Disc*). As you sit in your normal monitoring position, the sound should be seamless as it moves between the two loudspeaker systems. Three things need adjusting to achieve the best results: (1) crossover frequency; (2) subwoofer level relative to the nearfields; and (3) subwoofer location (see sidebar). In addition to the above-mentioned test disc, a bass guitar playing up the scale should remain consistent in both tone and perspective as it goes through the crossover range.

The PS 115 provides a big, solid, low end and can be easily adjusted to match anything from a modest 6-inch nearfield to punchy midfield units. The output is also capable of keeping up with most of these units. The response of the unit (33 Hz to 130 Hz  $\pm 3$  dB) is exactly what is needed to clearly hear what you have for both music and noise in the low end. There is nothing worse than finding out about ventilation rumble after the project's gone to



**THE LOW-DOWN:** The Tannoy PS 115 offers the quality of the AMS 210A at a more reasonable price.



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duplication. If you mix projects where you need to feel the bass, your nearfields have probably been thrashing themselves in an effort to satisfy you. With the PS 115, they can relax and produce the rest of the music with the tone that convinced you to use them in the first place.

The unit's RCA connectors have gold contacts, but this does not sidestep the inherent problems of this connector type, such as ground connecting after the signal conductor. So, always ensure the power is off on all amplifiers before making any connections. A fully-balanced version of the PS 115 should be available in the spring of 1997. The captive AC power cord does not have a ground lug, and so all noise must be grounded through the RCA connection to your audio system. In very quiet rooms a slight buzz acoustically radiated from the power supply transformer is audible from the unit. This buzz is not unlike that emitted by some power amplifiers.

The level control is a little fussy to adjust, as the gain must be very accurately set to get the best integration between the subwoofer and the nearfield units. The subwoofer low-pass (frequency adjustment) was very effective in creating a good tonal balance between loudspeakers, and a few minutes of adjustments were enough to achieve satisfactory results. Tannoy includes a very concise manual to assist the user in setup of the units.

The PS 115 is a very cost-effective way to add subbass to your monitor system. In most situations this will be a significant improvement in the ability for the monitor system to produce low frequencies and higher listening levels. Now you can have the big sound of those wall-mounted monitors without giving up the tone of your favorite nearfields.

**Price is \$1095. For more information, contact Tannoy/TGI North America, 300 Gage Avenue, Kitchener, ON, Canada N2M 2C4. Tel: 519-745-1158. Circle EQ free lit. #134.**

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

## THE ART OF SUBWOOFER PLACEMENT

**Once you've got a sub, here's what to do with it.**

The placement of a subwoofer can make or break its performance in any listening environment. Here are a few basic ideas to keep in mind as you start the process of experimenting with the locations of your subwoofer.

- The trick is finding a location for the subwoofer that will excite as many closely spaced room modes as possible and then find the mix position that intercepts as many of those closely spaced room modes as possible. Lots of room modes, closely spaced together, will provide the smoothest bass response in the room.
- Even if the walls or ceilings in your control room are fixed, you want to avoid a seating position that places your ears exactly half way between the floor and ceiling or exactly between two opposite walls, as these positions will likely have larger bass variations. A prime example of a bad situation would be a room with an 8-foot-high ceiling and a chair that places your ears at 4 feet above the ground.
- The position of the subwoofer should be in front of the listening position and preferably at, or behind, the nearfield monitor position. In a home theater, you might not be sensitive to localization of low-frequency energy, but here you are supposed to be paying attention.
- The general rule is that locating the subwoofer in a corner position offers the best chance of exciting the most room modes — diagonal, orthogonal (at right angles), and axial (on or along an axis).
- Locating the subwoofer in a corner also changes the loading on the subwoofer, which bumps the bass response up. Placing the subwoofer at the junction of two boundaries (one wall, one floor) gives you 3 dB more low-frequency energy than the woofer sitting in the middle of the floor. Placing the woofer in a corner (two walls and a floor) gives you another 3 dB more low-frequency energy than the two boundary condition, for a total of 6 dB over the unit in the middle of the floor.
- Adjust the subwoofer's gain control and the crossover's low pass -3 dB frequency to balance the subwoofer in relation to your nearfields for each woofer position you try.
- A 1/3-octave RTA doesn't have the frequency resolution to measure the low-frequency response, as the room modes are much narrower than 1/3-octave wide. Instead, listen to a slow progression of low-frequency notes using a keyboard instrument with very little high-frequency content and a consistent output level for each note, or a slow oscillator sweep. If there are drastic variations in the levels of the notes, you can be pretty sure that the level variations are room-mode related.
- If one position seems to provide significant variations, try another subwoofer position several feet away. Because the low-frequency wavelengths are quite long (10 to 35 feet), it usually takes a change of position equal to a good fraction of the wavelength to hear a difference. The position variations may be along a wall/floor boundary or may involve moving the subwoofer away from the wall by one or two feet.

Critical listening during this placement process is the most important step in the setup. Don't plop the sub down in some out of the way location and expect it to perform at its full potential. Listen to the various subwoofer positions the way you would listen to various microphone positions when you're setting up the mics on that stand-up bass.

—Huart A. Collier



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## Otari Status 18R Console



**MANUFACTURER:** Otari Corporation, 378 Vintage Park Drive, Foster City, CA 94404. Tel: 415-341-5900.

**APPLICATION:** Twelve-bus, large-format recording console.

**SUMMARY:** Digitally controlled analog audio console.

**STRENGTHS:** Extensive recall enables quick duplication of all console parameters (knobs, switches and sliders); 8 aux sends; dual path module design, splittable EQ between channel and mix path; VCA controllers; master mutes; very quiet; detailed punchy sound.

**WEAKNESSES:** Complex learning curve; I/O module signal level LEDs and meter bridge LEDs show identical signal level information and can not be split so one reflects channel input and the other tape output; modules are a bit cramped and indicator LEDs are very small.

**PRICE:** Approximately \$950 channel w/o patchbay, \$1200 with. Price decreases as you add channels, e.g.,: 32-channel w/o patchbay, \$29,950; w/patchbay, \$37,950. Configurations include 24-, 32-, 40- and 48-input/output modules (no patchbay available on the 48). Prices include VCA automation, meter bridge, and floorstand on all sizes. Options: moving faders about \$300/channel; Dynamics (compressor, limiter, gate) around \$300/channel.

EQ FREE LIT. #: 135

BY BENNET SPIELVOGEL

IF YOU WANT comprehensive signal routing, the ability to create groups on the fly with blinding speed, total image recall, warm musical EQ, enjoy learning new techniques and methods, and don't mind combining nontraditional ideas with old standby arrangements, you'll find the Otari Status is an astonishing console. For around \$30K, you get 32 I/O modules that offer fast recall of every console parameter. Plus, you don't have to go through layers of computer screens and menus or deal with a rotary that's a tone control one minute and then reconfigured to be an aux send or pan pot the next.

The Otari Status 18R gives you dedicated switches and pots. That control, combined with how you configure and recall signal path, sets this console apart from others in this price range. Otari has a long history of building solid, dependable professional multitracks and recording consoles. The Status 18R marks Otari's move into an area usually reserved for desks that cost a bundle. It's a complicated trip down the digital-analog lane, so let's take it one step at a time.

The gig: *EQ* sets up a few days to evaluate the Otari Status 18R recording console at Big Time Audio (BTA) record-

ing studio in Dallas. I drive from Austin to Dallas not knowing what to expect. [*Bennet: You gotta have faith, dude...—HGL.*]

I found BTA's Status in a well-designed, 20-foot x 30-foot, fully equipped control room. Owner Martin Walters's great staff includes main engineer Steve Browne, who knows the console forward and backward. BTA's large live room — a combination of wood, acoustic treatment, 22-foot-high ceilings and lighting that makes you want to play your ass off — proved an asset for tracking the large sessions at which the Status excels. I worked on three different projects at BTA and was able to get a good feel for using this unique recording console.

For three days, Steve packed the room with musicians, thus enabling me to see how the Status responded to various kinds of projects and all that that entails — from satisfying musicians cue requests to faithfully capturing expert musical performances without being intrusive. The console let us easily transition between tracking, mixing, returning to overdubs on another tune,





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STATUS SYMBOLS: Steve Brown & Martin Walters of Big Time Audio

the toms are subbed to if I'm using top and bottom snare mics with the polarity reverse selected for the bottom mic — is all on that disk. Once loaded, all I need to do is set the individual pans for each module and adjust EQ if necessary. The auxes handling the cue mix, the effects send/rtn, and the monitor path are all loaded from what I initially created on the diskette. You can also create a mix diskette. These little pictures of the console switch settings are called snapshots, and a diskette holds 50 snapshots.

## RECALLED & NULLED

One of the sessions we did was Larry Spencer's *Brazzology*: trumpet, upright bass, drums, grand piano, and tuba. We used no outboard mic pres — just a terrific live room, hot players, and a lot of good mics placed by an engineer with ears. You'd walk into the studio and go back into the control room and the sounds were very close. This is a very natural-sounding console, but it does offer very comprehensive EQ if you need it.

The Status EQ is for real; no simple bass treble and sweepable mids like you find on so many consoles these days. Otari gives you four bands, all sweepable with a selectable Q (bandwidth) on the LMF and HMF bands that could be set at two octaves or a fifth of an octave if you ever have to notch something at a specific frequency. The EQ breaks down as follows: HF shelving filter  $\pm 15$  dB, 12 kHz–18 kHz; HMF peak/dip filter  $\pm 15$  dB, 400 Hz–8 kHz; LMF peak/dip filter  $\pm 15$  dB, 75 Hz–3 kHz; LF shelving filter  $\pm 15$  dB, 35 Hz–600 kHz; high-pass filter in/out  $-3$  dB down at 80 Hz.

During the *Brazzology* sessions it became obvious we'd have some time on our hands. We were in a tracking mode, but we did have a completed song from the day before. Instead of waiting, we decided to change the entire board and do a mix. I don't know any engineer that looks forward to this arrangement, but with the Status mov-

ing from tracking to mixing and then back to tracking is easy.

Steve saved the position and setting of all pots, faders, and switches using a feature called Image Re-

call. You can save 15 images to a diskette. Once you save to diskette, load the setup containing your basic mix configuration and a-mixing do you go. The mix was automated using Otari's DISKMIX. This is a standard write, read, update, VCA, timecode driven automation similar to other styles on the market. It runs on an MS-DOS style computer (486 and higher).

After the mix, console settings (EQs, levels, aux sends, you name it) were completely different from when we tracked. I doubt, though, if it took us over two minutes to reconfigure the console exactly as we had it when we were recording.

We used the Status nulling feature to reset the console for tracking. The first step: load the tracking image you saved earlier. Then Steve selected horizontal nulling (as opposed to vertical nulling) from the two-line LCD menu at the bottom of the master module. With nulling engaged, as soon as you turn a knob, move a slider, or activate a switch for a particular I/O module, a strip of 16 LEDs light up on that I/O module. Turn the knob and make the LEDs go out. The idea is to null out the lights. When the lights turn off, the switch is reset exactly as it was. You work horizontally, and two people working each line of knobs from opposite ends of the console can reconfigure in no time. The "lights that you make go out" are on each I/O module. These 16 LEDs are multimode indicators that can show signal level (VU), track assign, and switch status.

## INS AND OUTS

The console uses standard XLR mic connectors on each module along with direct out, channel insert, mix insert, tape return, and line in. Otari also gives you a series of DB-25 connectors for connecting monitor amps, aux sends and returns, 2-track send/return, and the 12-track busses, which split to 24 discrete

*continued on page 120*



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121	Grace Design	32	303-443-7454	70	Studer Revox	81	818-703-1100
105	Hahnner Midia	33	707-578-2023	56	Summit Audio	219	408-464-2448
106	Hosa Technology	35	714-736-9270	47	Sweetwater Sound	82	219-432-8176
86	Illbruck	98	800-662-0032	38	Symetrix	83	800-288-8855
140	JBL Professional	XX	818-895-8190	11	TC Electronic	77	805-373-1828
106	JRF Magnetic Sciences	37	201-579-5773	57	Tannoy America	84	519-745-1158
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76	Manny's Mailbox Music	95	212-819-0576	51	Yamaha Pro Audio	91, 92	714-522-9011
84	Markertek Video Supply	43	800-522-2025				



## Niche Automation Station



**MANUFACTURER:** Russ Jones Marketing Group, 17700 Raymer St., Suite 1001, Northridge, CA 91325. Tel: 818-993-4091.

**APPLICATION:** Control MIDI devices (sequencers, faders, mixers, etc.) by sending out MIDI commands with hardware switches and faders.

**SUMMARY:** Costs more than inexpensive fader devices, but does more.

**STRENGTHS:** Monitors previously recorded MIDI data to avoid controller "jumps"; four additional knobs for controlling effects; useful LCD display; perfect match for Niche ACM MIDI mixers; snapshot and dynamic modes.

**WEAKNESSES:** Faders transmit controllers and pitch bend only (no pressure, notes, or program changes); computer editor software for programming the fader and switch assignments would be nice.

**PRICE:** \$799

**EQ FREE LIT. #:** 132=6

**BY CRAIG ANDERTON**

Hardware fader boxes provide a physical interface to MIDI devices by generating continuous controller (and other messages) over the channels of your choice, but most have one glaring omission when sending messages to MIDI mixing devices (sequencers, VCAs, or mixers): they can't compare the current fader position with previously recorded moves. With pro-level console automa-

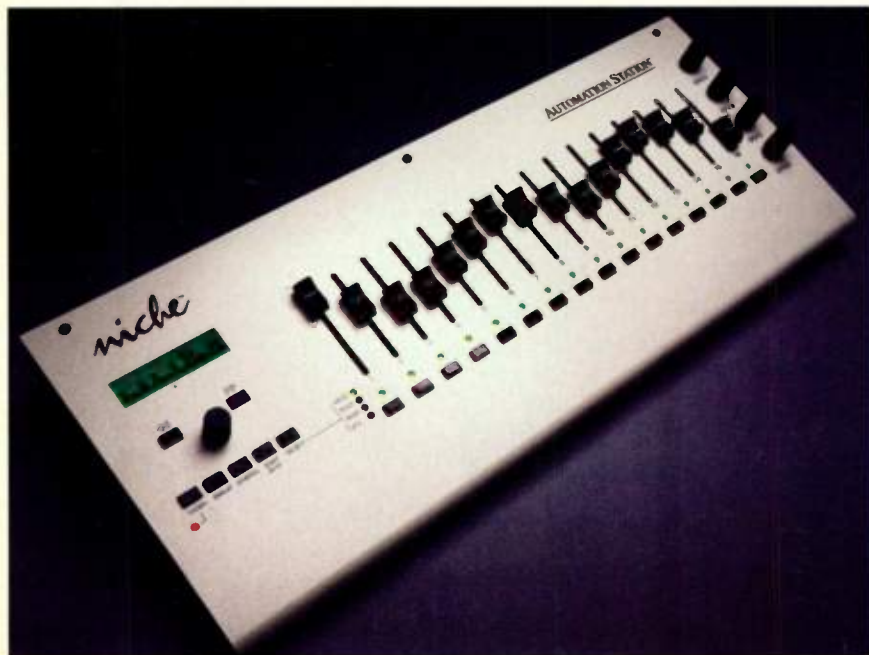
tion, you first move the fader until a light indicates that its physical position matches the mixdown "move" already recorded on the track. You then punch in seamlessly and make your changes. Punching with a budget fader box records the current physical fader value; if this is different from the existing control track level, there can be an abrupt level (or other controller) change.

The Automation Station (AS) fader box includes a MIDI input that monitors previously recorded sequencer data in its LCD (not quite moving faders, but the graphical representation comes close), and the physical fader is constantly being "nulled" to the incoming value. Therefore, as soon as you punch, moving the fader up adds to the current value regardless of the fader's physical position. Moving the fader down subtracts from the existing value.

So what happens if the control signal is about halfway up and you want to increase the level, but the fader is physically all the way up? Pressing a button can "disconnect" the faders, which lets you reset one or all to whatever physical position you want. "Reconnecting" the faders re-enables them to the current controller value.

Specs-wise, the box has sixteen 60 mm faders, 16 programmable buttons, 4 knobs for controlling external effects (you can assign 16 sets of programs for the 4 controller knobs—one for each MIDI channel), 16 x 2 line backlit LCD, and a programming section with 7 buttons and a data knob. The AS comes set up for controlling two Niche ACM MIDI-controlled attenuators, but you can program the faders and buttons to any channel, as well as save and load AS configurations via sysex. Faders and effects knobs send your choice of controllers 000-127, pitch bend, or off. Buttons can toggle between two values for controllers, pitch bend, pressure, program change, song, or pattern, as well as initiate start, stop, and continue. You could even toggle between sending a controller message and, for example, bend message.

Faders and buttons can be grouped or ungrouped, as well as "cross-grouped" (as some values go up, others go down—good for crossfades) or nested within other groups. Other features include 32 MIDI-recallable snapshots and several utility features (such as using a fader to crossfade between snapshots and ACM-specific options). It costs more than the average bear, but the AS input tracking feature makes overdubs painless and greatly simplifies punching. If you've avoided fader boxes because they lacked the nulling feature of pro units, the AS provides an ingenious and comparatively low-cost solution.





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have been nice, but they would've come at greater expense.

#### TURING IT ON AND DIALING IT IN

I used the M1600 on a few different sessions, including a full (eight-mic) drum kit overdub that involved the drummer playing to existing tracks of click,

rhythm guitar, and vocals. The EQ is simple and very manageable. The wide midrange sweep (100 Hz-10 kHz) allows for a lot of adjustment. Cutting 1 k, boosting the top and a little on the bottom got a monster kick drum.

I also experimented with snare drum tone, and without using anything on the

top snare head I was able to dial in or out as much ring as desired. Very cool EQ, and we wound up keeping all the tracks. Besides drums we added some head-banging electric guitar, two amps, a couple of Shure SM57's and an A-T 4033 on the room. The M1600 took whatever we fed it and never sounded murky.

The board is very quiet and adds very little coloration unless you dial it in. I noticed this when I did some A-B vocal and acoustic guitar comparisons between the M1600's mic pres and a few high-dollar, solid-state mic pres. The vocals sounded rich and the acoustic guitar sparkled using the board's mic pres.

The meter bridge option works well, but it's not a necessity. [Hint: When you install the meter bridge, invest in a small pair of needle-nose pliers as you'll be able to grab the tiny (17 on the sixteen channel and 25 on the twenty-four channel) connectors a lot easier with this tool instead of your fingers.] The meter bridge (12-segment LED type) can reflect tape returns or group/direct outs. Because the M1600 comes with only 8 onboard mic pres, you may want the MA-8 mic pre option. The MA-8 is an 8-in/8-out, one-rack-space-high mic pre that connects via 1/4-inch TS unbalanced outputs to the M1600's balanced line ins.

#### SUMMARY

This economical board offers many features folks take for granted but which are often overlooked on budget 8-bus consoles. For example, balanced ins and outs, phantom power, a lot of auxes, extended headroom (those drums were loud and those guitars screamed), direct outs on every channel, and the ability to send groups to the stereo bus without repatching. You also get additional inputs with volume and pan in mix mode (16 or 24) depending on what size you purchase. And you can simultaneously record and monitor 24 tracks (using the direct outs) on the 24-channel version (16 on the sixteen channel).

I liked this board. It's got a punchy rock 'n' roll sound and is very well-suited to the 8-track digital machines because of its low noise floor. If this is your first console or you want to upgrade from an older, less flexible board, the M1600 could work for you.

EQ

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# Electric Crayons, Anyone?

A vacuum tube microphone preamp/direct box project

BY EDDIE CILETTI



Happy New Year! Thanks to Craig Anderton, I had the good fortune to chair a workshop on vacuum tube technology at the '96 AES convention (for more details, visit <http://www.users.interport.net/~edaudio/>). One of the benefits of interviewing prospective panelists was that certain missing pieces of my own audio puzzle were found. (The workshop hopefully did the same for those who attended.) Did you know, for example, that asymmetrical distortion generates even-order harmonics, while symmetrical distortion produces odd-order harmonics? Contrary to popular opinion, neither vacuum tubes nor transistors are exclusively responsible for either type of distortion. Idiosyncrasies aside, it's really about circuit design.

Fig. 1 shows two distortion variations (in red and violet). Notice how the violet wave follows the green wave perfectly during its positive excursion but falls short of the mark during the negative swing. The red wave is more symmetrical, but not "clipped," as would be

the case if an IC opamp were overdriven. Opamps are visibly clean right up until the point of clipping, after which the top flattens out (there are no soft edges at the transition).

### FIND IT OR DO-IT-YOURSELF

Looking to cut your teeth on a simple vacuum tube project? Keep your eyes peeled for an Altec 1566A microphone preamplifier, circa 1958 (see fig. 2). I found two of these single-rack-space critters, one at an outdoor religious theater in Eureka Springs, Arkansas and another at Baby Monster Studios in New York City. (Quite a stretch, eh?) The 1566A is a sleeper/dust collector that can be had for less than a song (a verse, perhaps?) and turned into a usable addition to your arsenal of "Electric Crayons" with just a bit of effort.

Fig. 3 is a schematic of the 1566A. With the exception of an Instrument Input and a "Gain" switch, the circuitry is unmodified. (See sidebar for details about modifications.) The performance is typical of simple Class A circuitry — it has a wide nonlinear region between clean and clipping. I used it (without the input and output transformers connected) to generate the distorted (red and violet) sine waves in fig. 1. Of course, the goal of amplification is to reproduce the source — in this case, a sine

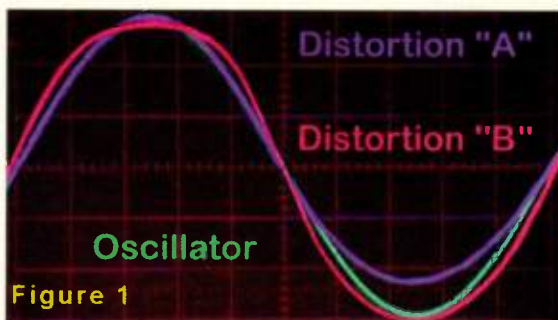


Figure 1

power than those used for PCB work. Select a tip that's at least 1/8-inch to 3/16-inch wide. Remember to get the work hot enough so that it can melt the solder — don't ever "paint" or drop solder, it must flow!

### UNDERSTANDING VOLTAGE AND CURRENT

This is not a battery-powered project. Vacuum tubes require two power sources: a low-voltage, high-current supply for the filaments and a high-voltage, low-current supply for the plates. From right to left, fig. 4 shows how wall juice gets converted into tube food. The tall vertical lines represent the iron core of the power transformer. The primary coil on the right gets connected to "117 v / 60 ~" while the two secondary coils create 110 VAC — volts (of) alternating current — and 22 VAC.

*Caution: High voltages can give a buzz that can end your lifetime. Use caution and remember that capacitors will retain their charge even after the power is turned off.*



Figure 2

wave oscillator (in green) — as accurately as possible. When overdriven, however, this circuit does exemplify the qualities people associate with vacuum tubes (warm, phat, and smooth) although Class A Neve gear exhibits a similar phenomenon using transistors.

### DO IT YOURSELF?

Sure, why not? You'll need a punch tool to make holes into a metal chassis for the tube sockets. Soldering some of the more massive components requires an iron with more

A pair of diodes — RS-1 and RS-2 — serve as a half-wave voltage doubler. Each rectifies half of the 110 VAC/60 Hz sine wave, turning it into about 250 volts direct current (DC), after which capacitors C9 and C7 smooth the humps into nonaudible, filtered DC. C6A and C6B provide further filtering, while R8 serves as the voltage divider for the different stages of amplification. The "B Plus" voltages are ballpark and unregulated, meaning that they will vary with the incoming line voltage and with tube condition. Only after the





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**Andy Jackson** - Pink Floyd (recording engineer) - "All the best vocals on the 'Deliver Us From Evil' album was done through the EQ-1. I certainly prefer the EQ-1 to other valve EQs for vocals. The new EQ-2 is probably the best all round EQ I've ever used."



**Chris Porter** (Producer) - "Take That" - "I bought one of the Amp EQ-1s and I've enjoyed using it immensely. It gives a unique quality to the vocals in particular. Take That 'Back for Good' is a typical example of the EQ-1 adding depth and presence to a vocal track."

**Tom Lind Alge** (Star Grammy Award Winning Engineer) - "The Indigo 2051 EQ has given me the ability to EQ with clarity, rather than just tone. And it's to be very honest, any professional sound? Have some access. I patch it for 20% and it allows the 80% depth and clarity."

**Stephen Croes** (Producer/Award Winning Engineer) - "I've used the Indigo 2051 EQ on many recordings. The Indigo 2051 EQ and 2021 Compressor are exceptional - both responsive and flexible. I can string on the audio, hear a sound or just details. These are real tools for any level of music production."



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## WHERE TO FIND IT

Input and output transformers (and application information) are available from:

- Jensen Transformers, 10735 Burbank Blvd., N. Hollywood, CA 91601. Tel: 213-876-0059.
- Reichenbach Engineering, 1124 Barstow Ave, Eugene, OR 97404. Tel: 800-627-7277 or 541-689-0893.

**Table 1**

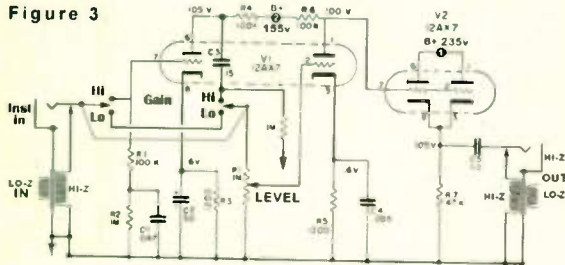
Manufacturer	Model	Application	Impedance	Price	Notes
Jensen	jt-115k-e	mic pre	150/15 k	\$66.51	—
Jensen	jt-10k61-1m	output	11 k/600	\$124.28	1
Reichenbach	115Ke	mic pre	150/15 k	\$58.23	—
Reichenbach	13k6c	mic pre	150/37 k	\$47.77	—
Reichenbach	6110k-b	output	150/600/10 k	\$78.06	2
Reichenbach	10kb-b	output	150/600/10 k	\$70.73	3
AES	PT-442	power	125 V & 12.6 V	\$9.95	4

### Notes

1. Jensen recommends C5 be changed to 22 uF (250 volt minimum)
2. 80% nickel (lower distortion)
3. 50% nickel (can handle higher output level but with higher distortion at low levels)
4. The power transformer, as well as other parts, are available from: Antique Electronic Supply, 6621 S. Maple Avenue, Tempe, AZ 85283. Tel: 602-820-5411.

Note: 12.6 volt secondary requires full-wave bridge (4 diode) rectifier rather than 2 diode rectifier as shown in circuit diagram. Tubes, sockets, capacitors and resistors may also be purchased through: New Sensor Corporation, 20 Cooper Square, New York, NY 10003. Tel: 212-529-0466 or 800-633-5477. Web: <http://www.turnstyle.com/sovtek>.

**Figure 3**



tubes are in and warmed up will the voltage at points "1" and "2" be approximately 235 VDC and 155 VDC, respectively.

Note: RS-1 and RS-2 are very old-fashioned, oxide-style diodes. RS-3 is another dinosaur, the Selenium rectifier. If questionable, both can be replaced with type 1N4007.

The 22 VAC winding is rectified by RS-3. Unlike the half-wave voltage-doubler circuit for the plate supply, the two diodes that comprise RS-3 are configured for full-wave rectification. Since the winding is center-tapped, each diode rectifies an 11 VAC sine wave into a positive-going hump. When combined, the "two humps" effectively double the 60 Hz line to 120 Hz. (That's why power supply failures generate 120 Hz "hum.")

### THE AUDIO TOUR

V1 and V2 are 12AX7 dual triodes. Each half of V1 is wired as a Class A voltage amplifier in a configuration known as Common Cathode. By comparison, both halves of V2 are wired together in the Cathode Follower configuration for current gain. Don't freak, dudes and dudettes!

Tubes are real high impedance (Hi-Z) devices — just like a passive guitar or bass — and, in addition to making things louder (voltage gain), they can also convert impedance — in this case from high to medium (current gain). Unlike transformers, tubes and transistors can manipulate impedance without a level loss.

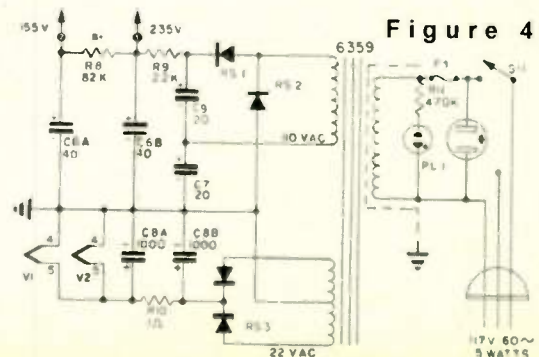
Remember, the outside world is a nasty place. Have you ever had an instrument cable that crackled when stepped on? That phenomenon is not an example of a bad cable so much as it's the wrong cable for the application. (Its capacitance is too high and the insulation between conductors is inadequate.) The reason there are transformers at both the input and the output is to match impedance with the outside world.

Low-impedance (Lo-Z) balanced sources, such as microphones outfitted with XLR connectors, can drive long lengths of cable. The input transformer converts Lo-Z to Hi-Z, and in doing so takes a small signal and steps it up to a higher, albeit more vulnerable, signal. (The power supply transformer manipulates voltage and current in the same way.)

After the tubes do their thang, the output transformer brings the impedance down to a level that's semi-impervious to electrical interference.

### INTRODUCING THE RELATIVES

While on the subject, the filament in a vacuum tube heats the cathode so that it will emit electrons, which are negatively charged. The high voltage at the plate accelerates and attracts the electrons while the grid controls electron flow. Each 12AX7 filament requires 150 milliamps (mA) so that the two in parallel draw 300 mA total. By comparison, the plate current can be calculated by taking the voltage drop across any plate resistor. For example, R4 has 135 VDC on one side and 105 VDC on the other. The voltage drop across R4 is 30 volts, therefore, using Ohm's Law ( $I=V/R$ ), the current is .3 mA with no signal applied. The filament current is 500 times that of the plate!



**Figure 4**



# HOLDS UP ON THE ROAD

## WHAT AND WHERE

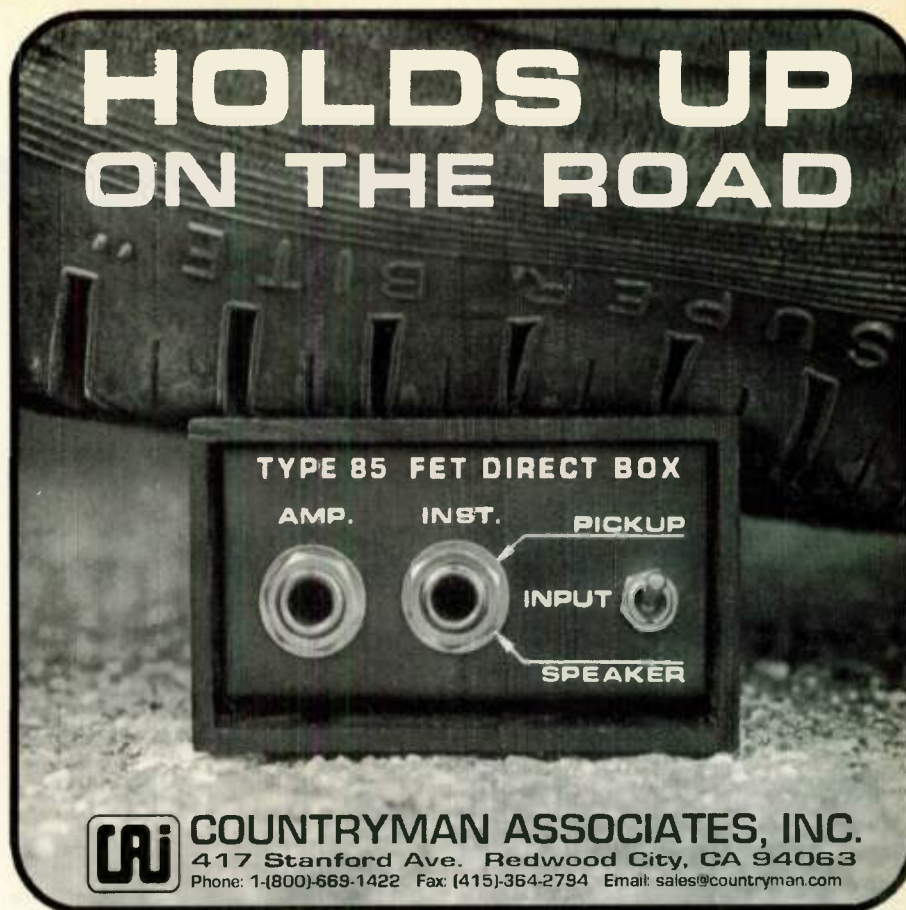
The 1566A included 8-pin (octal) tube-style sockets into which plug-in transformers or dummy plugs were inserted for balanced or unbalanced operation, respectively. Input and output connections were via barrier strips. The intended application was as a mic amplifier for a public address system. Capacitor C4 is most likely to either increase intelligibility or to compensate for less-than-fab transformers. The 1566A can be clean, but it will let you overdrive it to sweetness, hence the reference to "Electric Crayon," an audio component used to create a sonic signature color, as part of your audio palette. Enjoy. **EQ**

## MODIFICATION

On the unit I modified, the fuse was relocated to the rear panel and a 1/4-inch jack was put in its place on the front panel. The 1566A does make a great active direct box and has plenty of gain. Since the front-panel Gain control is only a "Level" pot (and is labeled as such on the schematic) between the first and second stages, it may be ineffective in controlling overload of the first gain stage.

The optional Gain switch reduces gain by eliminating the first stage, a simple solution that, unfortunately, does flip signal polarity. This seemed an acceptable compromise because the goal was to minimize circuitry changes (at least the first time around) to maximize any character the 1566A may have. Readers interested in more serious mods can contact me via snail or e-mail.

Of course, there is neither room for an XLR connector (input or output) nor is there phantom power (a project for the latter is in the hopper now). The first 1566A came with the original transformers, which were usable and full of character. The second 1566A had none, so I used what was laying around: a Jensen 115 k for the input (nice) and a Sescrom MI-33 that saturates way too soon. Transformers come in all shapes and sizes, but not typically with octal plugs. It is preferable that the transformers be mounted to the chassis. To do so, the octal sockets must be removed and mounting hardware created for the new transformers.



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# The Song Heard Round the World

## Placing your song on the Web (part 1)

BY JON LUINI & ALLEN WHITMAN

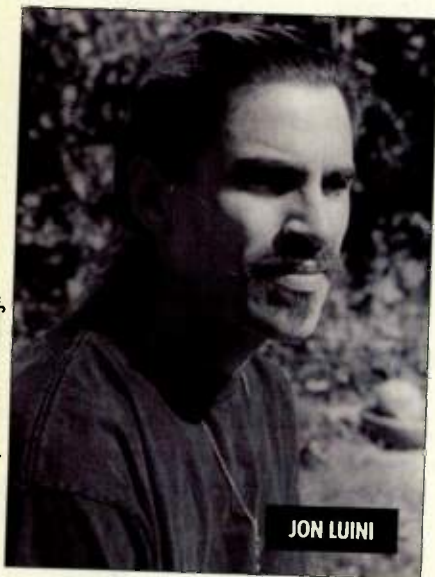


Photo by Michael Thornburgh

Hello again and thanks to all of you who contacted us and made it to the secret site and the secret message! Sorry, but budget constraints dictate that the secret decoder rings we had earmarked for you all be sent, instead, to *Time* magazine for their in-depth qualitative analysis of RealAudio files. In an article (12/2/96) on web audio they described these selfsame files as "tinny." That's better than "tiny." Us FezGuys immediately considered throwing in the towel in recognition of the cogent and superior nature of their research. Then we changed our minds.

If you didn't see last month's column; get Netscape, get RealAudio, go to <http://www.mermen.com/>, click on the fez, and follow instructions. Now for the new stuff: We're going to walk through the process of putting your music on the Web, split over two columns.

Will your file be on-demand or stream-enabled? On-demand means the user will download your file and then play it. Stream-enabled means that they will click on your file and it will play in real time, while they are online.

As there are multiple formats that

one can record in (ADAT, 4-track cassette, DAT, MiniDisc, hard disk, etc.), there are even more methods of creating and encoding audio files for use in the ether of the Internet. Be patient. The learning curve is, at first, slow. However, once you familiarize yourself with a particular format, you will discover that all formats follow similar principles and it is the finer points of hardware, software, and bandwidth limitations that will determine, for you, the most appropriate application (app) for your uses.

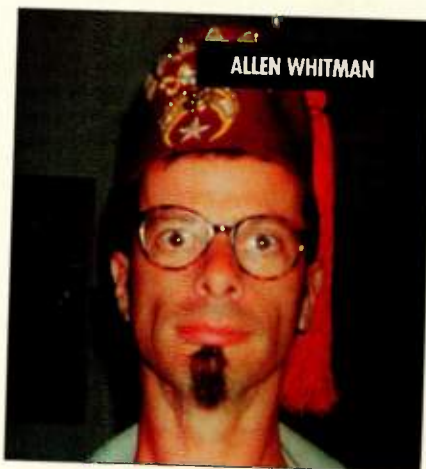
Take a piece of music. We suggest starting with a small piece, say, ten seconds worth. This way formatting and experimenting will take less time. Any audio source format will do, but choose music that is as clean as possible. Recommended audio source formats are those from the digital domain. Your hardware requirements are: an audio input, a sound card of some kind (recent Macs have this built-in, PC users please check that your machine is holding one) and some speakers or headphones for playback.

A note here: older computers may not have an audio input. That means your computer will not work for our purposes. If you are unsure as to your computers' guts, ask your salesperson or your geek friend (everybody has one these days). For the purposes of this column we're going to assume that UNIX users do not need these guidelines. Plug your audio source into your computer. Familiarize yourself with your computer's audio inputs. It is probably either an 1/8-inch stereo minijack or two RCA jacks. Run the appropriate cables from your au-

### THINGS THAT ARE NEW

LiquidAudio is here (albeit in rather beta form — be warned) and is Windows-only at this time. For you Windows users, test drive it at their site. URL: <http://www.liquidaudio.com>. Give them feedback. We'll get more in depth later.

Also: RealAudio 3.0 is now in beta for supporting encoding on Macintosh and UNIX platforms. For those of you who have been waiting because you don't use Windows, salvation is at hand!



dio source into your computer.

Now, on to the software requirements. This is where it gets interesting. You are required to have an app to convert your music into digital form on your hard drive. For the sake of simplicity we can suggest the following:

For Macs, (to purchase) SoundEdit 16 (URL: <http://www.macromedia.com/>) or (as shareware) SoundHack (URL: [http://sir.univ-rennes1.fr/pub/mac/utilitaires/audio\\_video/SoundHack/](http://sir.univ-rennes1.fr/pub/mac/utilitaires/audio_video/SoundHack/))

For Windows, (to purchase) Sound Forge (URL: <http://www.sfondry.com/>) or (as shareware) Cool Edit (URL: <http://www.syntrillium.com/cool96.htm>).

Start your app. Set the levels from your audio source within the app. To do this you will need to make some choices about what kind of audio file you want to create. Audio editing apps give you options. You will choose the sample rate, bit rate, and mono/stereo format. Discussions of the exact definitions of sample and bit rate are readily available, but can be verbose so we will not go into full detail here. For our purposes, it's useful to think of these figures as a trade-off between file size (read: manageability) and audio quality. The higher the figure (44.1 kHz as opposed to 22 kHz, and 16-bit as opposed to 8-bit), the better the sound, but the larger the file. From the dialog box in your app; set sample rates, bit rates, and stereo or mono. Since you are working with a ten-second clip, experiment and check the files' sizes (and sound quality) after recording. You won't go wrong with a 44.1 kHz, 16-bit stereo file, but it will take 10 MB of disk space per minute of audio. Check your available disk space!

continued on page 126



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## OTARI STATUS

*continued from page 106*

track outputs. Bus 1 splits to 1 and 13, bus 2 goes to 2 and 14, etc. You can probably save yourself a lot of wiring grief by springing for the patchbay option. It's well-labeled and color coded to match channel and mix paths.

### DRIVING IT HOME

On my last day at BTA, I drove the console myself. Dallas songwriter Colin Boyd had his band (drums, bass, guitar, harmony vocals, and lead vocals) in the studio. Colin wanted to record some covers and put together a demo package useful for getting bar and party gigs. Before the band arrived, I made a startup diskette based on what I thought session tracking would look like. As the drums were being set up and the mics patched from the studio into the control room, I started to adjust tape levels and monitor level.

Lo and behold I had signal going to tape and sound coming from the CR monitors. It wasn't difficult to set up and configure the Status and get it to obey. Speed, shortcuts, and the Zen of seamless operation would have been my next goal if I had about seven nonstop days to use the board. I like the sound of the console. The EQ works very well, there's plenty of auxes, and being able to create VCA groups on the fly is a powerful feature when you need to fade specific tracks at the end of mix while others need to decay naturally. All gain control, except for the stereo master fader, is via VCAs, hence the powerful grouping possibilities.

### CONCLUSION

This console has been on the market for about two years; it works and has established a strong track record in various studios. It's quiet, has a lot of punch, and can be configured and recalled very quickly. You're most likely, though, going to need some hand-holding in the initial learning stages. Look for a dealer who can give you some personalized instruction once the sale is made.

For the engineer, producer, or studio owner who wants more in terms of a full-featured board with memory and automation without spending megabucks, the Status 18R has a lot going for it. It felt comfortable handling unconventional jazz horn arrangements (trumpet and tuba), serious female vocals, and a band recording covers for a promo package. Its firmware-based design means it can be upgraded. For post and film work, it offers an option for 6-channel surround. **EQ**

## YOKO ONO LIVE

*continued from page 72*

We had a percussionist at a few shows, and the biggest challenge there was finding a way to mic tablas, which are very quiet. We ended up attaching Shure SM11 lavalier mics to the heads with Velcro, which worked nicely. The SM11's are big enough to capture the low end and don't bark if you accidentally strike them.

In addition to a pair of AKG C414's onstage for the audience, Wally had a portable Sony timecode DAT with a Shure VP88 at his mix position. The Sony generated timecode that he sent to me for sync with the DA-88's and video cameras when necessary. We were dealing with different video standards, so we printed our code as audio on the video tape as a reference. The video would have to be converted from PAL to NTSC for editing.

The Mackie sat on top of the recording rack to minimize the use of space, which came in handy at the Berlin Loft where I had to set up in a dressing room offstage. I mounted the TASCAMs, Mackie power supply, two dbx 160A's, a Yamaha SPX900 (for rough mixes), and a Crown D-75 with a pair of JBL Control 1's in a double-wide rack. I kept a 32-pair XLR snake in the console case to patch into a transformer-isolated split, and the power for the recording rig was on one cable. It was a great-sounding and versatile rig in a small package. It took all of five minutes to set up the recording rig so that we could concentrate on the live event. The rig proved to be a savior in San Francisco, where we only had 20 minutes to change over between acts. We were the only crew to record our show on multitrack.

After all was said and done, the production came off flawlessly. A few basic principles are still best. Listen to the artist, understand the music, keep it simple, and try to fix sonic problems at the source. In reviewing the multitrack tapes, I think we have an honest representation of a very special event.

*Jerome Fox is an independent engineer and producer based in the New York area. In addition to Yoko Ono, Jerome has also worked with John Abercrombie, John Denver, and Panzer Zulu. He can be reached through [Jyrome@aol.com](mailto:Jyrome@aol.com) and [Pilot@interport.net](mailto:Pilot@interport.net).*

## G3 LIVE

*continued from page 66*

### KICK OUT THE JAMS

When it comes to the end-of-the-night jam, I'm basically handling them by the seat of my pants. It's about a two-minute scramble of techs rolling amplifiers out on stage and throwing a '57 in front of them. I've got the headphones on and all I can hear is the thunk when they set the mic stand down in front of an amp. "There's Steve Vai's amp." Then there's another thunk. "There goes Eric Johnson's amp." Then we just go for it.

We've got it down to a system now and everybody's got an assigned channel on the Harrison, so it's really not as bad as it sounds. The first night of the tour we did run into a little problem with the jam because everybody got patched-in one channel off. In addition to Vai, Johnson, and Satriani, we had Kenny Wayne Sheppard on the bill and Neil Schon showed up as a guest guitarist. So when it was Steve Vai's turn to solo I pushed up the fader and Eric Johnson came up. When I pushed up Eric Johnson's fader, Neil came up. So it was a bit of a mess and it did suck for a couple of minutes, but by the end of the first round of solos everything was under control.

When guest guitarists want to come down and jam we tell them to show up with an amplifier and a guitar. We try and set up a basic level for everybody out there. Since Joe's amp is always set at 108 dB, we tried to get Steve Vai and Eric Johnson to at least mark a place on their amp that'll achieve the same result without blowing him off the stage. It's a little harder to do that with the guest guitarists that show up because we don't soundcheck the jam. We usually just kick 'em out on stage and tell 'em to go for it. Fortunately, everybody's tones are different enough so that the sound separates pretty well and you just have to stare at somebody and make sure you have them in the mix.

It's really great just mixing a straight instrumental show. It's nice not having to compromise any of the band mix for the sake of a vocalist.

In terms of what I've learned...don't accentuate that high-mid stuff on the guitars, especially if you're in a band with vocals because that's where the vocals have to sit. They can't both live there without hurting somebody. There's certainly going to be people who argue, but I think after this tour and mixing the jam four or five nights a week, I'm going to have credentials for mixing a guitar band!

*Doug Nightwine can be reached at [Nightwine@earthlink.net](mailto:Nightwine@earthlink.net).*



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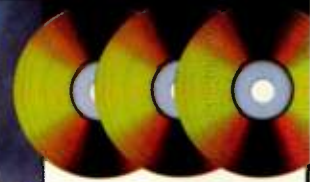
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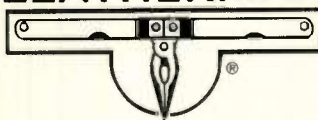
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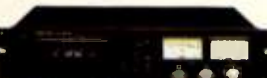


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- Cascade feature provides simultaneous parallel operation of multiple machines, and a 9-pin parallel (GPI) interface facilitates external automation



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

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

General	PMD-101	PMD-201	PMD-221	PMD-222	PMD-430
Stereo/Mono	Mono	Mono	Mono	Mono	Stereo
Inputs	2	2	3	3	3
Heads					
Inputs/Outputs					
Mic Input	1/4-inch	Miniplug	Miniplug	Mini/XLR	1/4-inch
Built-In	—	Yes	—	—	—
Remote Jack	—	Yes	Yes	Yes	—
Modular Tel. Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR/Dolby NR	—	—	—	—	Yes
Mic Attenuation	—	0, -10dB, -20dB	0, -10dB, -20dB	0, -10dB, -20dB	0, -15dB, -30dB
Ambient Noise Cont.	—	Yes	Yes	Yes	—
MPX Filter	—	—	—	—	Yes
Manual Level Control	—	Yes	Yes	Yes	—
Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pitch Control	±20%	-20%	±20%	±20%	±5%
Bias Fine Adj.	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

## Telex ACC2000/4000 Cassette Duplicators

Designed for high performance and high production, Telex duplicators also offer easy maintenance and ease of use. The ACC2000 is a two-channel monaural duplicator, the ACC4000 is a four-channel stereo duplicator. Each produces 3 copies from a cassette master at 16X normal speed and with additional copy modules you can duplicate up to 27 copies of a C-60 original in under two minutes. And they copy both sides at once.

The XL Series feature "Extended Life" cassette heads for increased performance and wear characteristics. They also offer improvements in wow and flutter, frequency response, S/N ratio and bias.

- Easy Maintenance:**
- Slanted work surface and "heads-up" cassette platform prevent oxide build-up on the heads and makes cassette loading and unloading easier
  - Three point tape guidance system eliminates skew problems and prevent unnecessary wear and tear on the tape head mechanism
  - Audio and bias, along with head adjustments, are made easily from the top of the unit and a switch on the back engages the head and pinch roller for convenient cleaning
- Fingertip Operation**
- Individual rotary audio level controls
  - Peak reading LED indicator
  - Side A or B select button
  - Stop all tapes instantly, at any point during the copy or rewind cycle
  - Short flip indicators alert you if a tape stops before the original dose, identifying incomplete copies caused by jam or short
  - Automatic or manual selection of record and copy operation
  - Rewinds tapes to the beginning or end automatically (AUTO mcb) or manually
  - In AUTO mode the copy button activates the entire rewind/copy/rewind sequence. In manual it starts copying immediately

- ACC2000 Mono Master Module:**
- 1/2 track, two-channel monaural duplicator produces 3 copies from a cassette master at 30 ips (16X normal speed)
  - Expands up to 27 positions by adding ACC2000 copy modules
- ACC2000 XL Mono Master Module:**
- Same features as ACC2000, plus Extended Life cassette heads
- ACC4000 Stereo Master Module:**
- 1/4 track, four-channel stereo duplicator. Same features as ACC2000 Mono Master Module/
- ACC4000 XL Stereo Master Module:**
- All features as ACC4000, plus Extended Life cassette heads. Can be configured for chrome or ferric cassette duplication
- ACC2000 Mono Copy Module:**
- Each module has four copy positions with erase heads and controls for side select
  - LED displays indicate end-of-tape status for each pocket
- ACC2000 XL Mono Copy Module:**
- Same features as ACC2000 Copy Module, plus Extended Life cassette heads. Configurable to ACC2000 XL Master Module
- ACC4000 Stereo Copy Module:**
- Same as ACC2000 Copy Module, except 1/4 track four-channel
- ACC4000 XL Stereo Copy Module:**
- Same as the ACC4000 Copy Module, plus Extended Life heads. Configurable for chrome or ferric cassette duplication

## Copyette EH Series Duplicators

The Copyette series produce high quality, low cost cassettes in large quantities at nearly 16 times normal speed. Available in two versions, the Copyettes are capable of duplicating either one cassette or three at a time. Also available in both mono and stereo models.

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

## Equitek Series Studio Condenser Mics

The "bench mark" for cost and performance, the Equitek series of microphones incorporate a unique servo design and exceptional flexibility to provide extraordinary ballistic capability and exceptional transient response.

### E-300

A multi-patterned side address mic that combines vintage capsule design with advanced head-amp electronics, the E-300 has an unusually wide frequency response of 10 Hz to 20 kHz and an exceptional dynamic range of 137 dB. Also extremely low self noise of 110dB. Ideal for the most critical applications.



Shown with optional ZM-1 Shockmount

Unique powering of all mics is accomplished with a pair of rechargeable NiCd 9-volt batteries in combination with 48-ohm phantom power. This overcomes inherent current limiting associated with most phantom power supplies and can supply ten times the current.

### E-200/E-100

The first member of the current Equitek family, the E-200 is also a dual capsule side address multi-pattern condenser mic, but with lower specifications than the E-300. The E-100 uses the same electronics as the E-200, but with only one of the same capsules in a supercardioid pattern.

- Frequency response of 10 Hz to 18 kHz
- Dynamic range of 137 dB • Low self noise of 16 dB

## audio-technica AT4033

### Cardioid Capacitor Microphone

The AT4033 is a transformerless, studio microphone designed for use in the most demanding applications.

- Utilizes a gold-plated, "aged-diaphragm" condenser element with an internal baffle plate to increase signal-to-noise ratio, which coupled with low-noise, transformerless electronics, makes the AT4033 ideal for critical digital recording
- Dynamic range is 123 dB without the built-in attenuator
- Accepts up to 140 dB SPL without capsule or electronic-system distortion above 1% T.H.D. and a built-in switchable 10 dB (nominal) pad increases it to 150 dB
- 2-micron-thick vapor-deposited gold diaphragm provides accurate reproduction of even the most subtle sounds
- Permanently installed internal open-cell foam windscreen
- Integral 80 Hz hi-pass filter for easy switching from a flat frequency response to a low-end roll-off

## AT4050/CM5 Multi-pattern Studio Capacitor Microphone

Supremely transparent and accurate, without sacrificing warmth and ambience, the AT4050 expands upon the AT4033, to set the standard for studio performance mics.

- New large-diaphragm design utilizes two capacitor elements to provide consistent, superior performance in cardioid, omnidirectional and figure-of-eight polar pattern settings
- To achieve a warm, true-to-life sound in all polar pattern settings, Audio-Technica vapor-deposits pure gold onto specially-contoured large diaphragms which are aged through five different steps to ensure optimum characteristics over years of use. The transformerless circuitry results in exceptional transient responses and clean output even under extremely high SPL conditions

## SENNHEISER

### HD 265

The HD-265 is a closed dynamic stereo HiFi/professional headphone offering a high level of background noise attenuation for domestic listening and professional monitoring applications. It is a suitable choice for monitoring applications in professional studios and to match the top of the range HiFi systems, delivering a clear and tonally balanced sound with a minimum of distortion.

### HD 580

The HD 580 is a top class open dynamic stereo HiFi/professional headphone. The advanced design of the diaphragm avoids resonant frequencies. The HD 580 can be connected directly to HiFi systems of the highest quality, in particular DAT, DCC, and CD players. This headphone is an ideal choice for the professional recording engineer recording classical music.



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## APHEX 106 Easyrider

### 4-Channel Auto Compressor

- Four individual channels in one rack space
- Automatic layered attack and release times
- Independent switches for fast or slow processing
- Dial in compression up to 20 dB
- Independent on/off switches
- -10 dB/+4 dB switch on each channel
- Voltage Controlled Attenuator (VCA) 1001 outperforms all other VCAs
- Linkable pairs for stereo applications

## 107 Tubessence Dual Channel Thermionic Mic Preamp

The 107 provides two discrete triamp channels, each with its own dedicated controls. A switchable 48 volt phantom power supply makes it compatible with all mics. The 107 delivers outstanding sonic performance, as well as a great degree of presence, detail, openness and image. It also provides extended high frequency response without any harshness and an improved bass response.

- Two independent channels with front panel XLR inputs
- Up to 64dB of gain available
- 20dB pad with red LED indicator
- Two LED input meter
- Full 48 volt Phantom power with mid LED indicator
- Low cut filter with red LED indicator, 80Hz, 12dB/octave
- Polarity inversion switch with LED indicator
- Individual channel remote mute capability
- Switchable +4dB/-10dB output with 1/4" TRS phone jacks

**TUBESSENCE:** Combines the best attributes of both tube and solid state circuitry to provide performance unmatched by conventional designs. The solid state front end is transformerless and only expensive, great sounding capacitors are used in the signal path. The tube circuit imparts the sonic characteristics of tubes without the extremely high voltages, heat, fragility, and short life span of conventional tube circuitry.

## 109 Parametric EQ with Tubessence

The 109 is an extremely versatile and high performance single rack space parametric vacuum tube equalizer with unique features, flexibility and sound.

- True tube circuit (Tubessence) in the output stage for a "warm," "sweet" and "rich" sound.
- Dual (stereo) two band or mono four band equalizer configuration offers flexibility for general sweetening to critical problem solving situations.
- In Dual Mode each channel has +/- 10dB of input gain, a Low-Mid (20Hz-2kHz) band and a Mid-High (200Hz-20kHz) band.
- Each band has +15dB/-15dB boost or cut with center detent (flat), sweepable frequency adjustment, variable bandwidth, and switchable peak or shelving filter mode.
- Operates in the EQ flat (calibrated center detent) mode yet still passes signal through the Tubessence vacuum tube stage. This is helpful for "warming up" digital signals.
- 1/5 octave to 2 octave bandwidth adjustment.
- Switchable -10dB/+4dBu operating level.

## t.c.electronics Wizard M2000 Studio Effects Processor

- The M2000 features a "Dual Engine" architecture that permits multiple effects and six different routing modes. There are 250 factory programs including reverb, pitch delay, delay, chorus, flange, phase, ambient, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit analog conversion, AES/EBU and S/PDIF digital inputs/outputs, "Wizard" help menus, 16-bit dithering tool, Tap and MIDI tempo modes and single page parameter editing.
- The array of enhanced pitch shift (up to 8 voices), chorus, and delay effects are characterized by their precision and versatility. Everything from the fine and subtle to the wide and spectacular is handled with equal superiority. The algorithms in the dynamics section are unique as stand-alone effects, but are particularly useful in combination with other effects. Those might be de-esser/room, gated half or compressed pitch. The possibilities are endless.
  - Tempo Tap function allows tempo to be adjusted in beats-per-minute and sub-divided any way you like—even in triplets. The tempo can also be read from MIDI.
  - Preset "Gilding" (morphing) function ensures seamless transition between effects. Very useful in mixing situations.

## ALESIS 3630 Compressor

### RMS/Peak Dual Channel Compressor Limiter with Gate

The most powerful compressor in its class, the 3630 is a dual-channel compressor that offers Ratio, Threshold, Attack and Decay controls to handle the toughest signals. It also offers a choice between RMS and Peak compression styles, plus Hard and Soft Knee dynamic curves for every application from subtle gain control to in-your-face punch. Ideal for use in applications from studio recording and mixing to live sound reinforcement and broadcast.

- Dual mono or linkable true stereo operation.
- User selectable Peak and RMS compression styles as well as hard knee/soft knee characteristics.
- Dual 12-segment LEDs display gain reduction and input/output levels.
- Each channel's built-in noise gate has an adjustable threshold and close rate to ensure clean, transparent performance.
- Sidchain input for ducking and de-essing.
- 1/4-inch inputs/outputs switchable for -10dB and +4dB.

## M-EQ 230

### Dual 1/3 Octave/Precision Equalizer

Used extensively in recording studios since 1989, the M-EQ 230 provides 60 bands of EQ in a single rack space. Covering every band from 25 Hz to 20 kHz in 1/3 octave increments the M-EQ 230 is ideal for tuning the monitors in your project studio or even getting the most out of a home stereo setup.

- Two independent 30-band 1/3 octave graphic equalizers.
- Engineered with Alesis' Monolithic Integrated Surface Technology, gives you more features and better audio performance than many 2-space rack devices.
- Equipped with 1/4" and phono jacks.
- Auto Power Muting function protects your components from power on/off transients.
- Input switch allows you to easily compare your original signal to the equalized sound.

## NanoVerb

### 18-bit Digital Signal Processor

The NanoVerb breaks new ground in performance and sound by implementing an advanced, high-fidelity digital signal processor in an ultra-compact, easy-to-use and incredibly affordable package. If you're on a tight budget, you want to check out the NanoVerb; it has the features you need to get started.

- Introduces 16 powerful preset effects, including hall, room, plate and non-linear reverbs, true stereo chorus, flange and delay.
- Also includes three multi-effects programs—chorus/room, chorus/delay/room and rotary speaker/room—allowing you to achieve a complete instrument or vocal effects setup from a single unit.
- Adjust knob provides complete control over delay time, reverb decay etc., by allowing you to tweak each program until it's just right for your music.
- Equipped with professional 18-bit A/D and D/A converters and a 20-bit internal processor that operates at three million instructions per second.
- Front-panel includes input level, effects mix, output level, program and adjust controls and dual-color signal input/clip LEDs. Rear panel interlaces include stereo 1/4-inch input and output jacks.
- Incredibly affordable, you can put two or three in your rack for dedicating to multiple sources. (Ultra compact, it requires only a 1/3 rack space.)

## MicroVerb 4

### Preset/Programmable 18-bit Signal Processor

An affordable solution for great sounding effects processing, the MicroVerb 4 goes far beyond the capabilities of any processor in its class. It offers the ability to edit and store your own customized programs, to utilize versatile multi-effects configurations and to take advantage of complete MIDI implementation.

- 18-bit D/A and A/D converters and 20-bit internal processor which combine with the clean effects algorithms to offer a frequency response from 40 Hz to 20 kHz and a wide dynamic range. The result is ultra-clean, great-sounding effects for every application.
- 100 preset and 100 user-editable effects include many varieties of reverb, delay, chorus, flange and more.
- Advanced effects include rotating speaker simulation, auto-pan, tap tempo delay and dual-send setups (send one effect to one channel and a completely different effect to the other).
- Many of the effects are in true stereo and several offer up to three effects at once.
- Each program provides two logical effects parameters that you can adjust in real time using two front-panel edit knobs or MIDI controls. For example, on a reverb program you can change decay and frequency content, and you can edit time and feedback of delays. Up to 100 edited programs can be saved to a dedicated user bank.
- Responds to MIDI program change and modulation, and it provides a special two-way TRS footswitch jack that offers both bypass and control functions.
- Easy-to-use "set-and-forget" interface offers a bright LED program number display. Just dial up a program number and start playing—that's all.
- Fits in a standard single rack space.

## MidiVerb 4

### Dual Channel Parallel Processor with Auto Level Sensing

The MidiVerb 4 extends Alesis' line of affordable professional multi-effects processing. It provides the sonic quality and programming power required for studio recording and live sound reinforcement while maintaining an incredible degree of affordability.

- Superb effects algorithms provide a wide variety of dense, natural-sounding reverbs, rich chorus and flange, versatile delay, rotating speaker simulation, pitch shift, panning and more.
- Auto Level Sensing feature automatically sets your input signal to the optimum level to take advantage of the MidiVerb 4's wide dynamic range.
- 18-bit oversampling digital converters add to the excellent audio fidelity, with a resulting 20 kHz frequency response and a dynamic range over 90dB.

## QuadraVerb 2

### Dual Channel Octal Processing Master Effects w/Digital I/O

- Alesis' most powerful signal processor, the QuadraVerb 2 offers the amazing audio fidelity of a high-end dedicated vocal reverb while providing powerful multi-effects capabilities.
- 300 programs (100 preset and 200 user-editable).
  - Octal Processing allows use of up to 8 effects simultaneously in any order. You can choose between over 50 different effects types for each block, including reverb, delay, chorus, flange, rotary speaker simulation, pitch shift, graphic and parametric EQ, overdriver and more.
  - Special features like five seconds of sampling time, triggered panning and surround sound encoding are also built in.
  - Selectable -10 dB and +4dB levels, servo-balanced TRS inputs and outputs.
  - ADAT Digital Interface allows you to work entirely in the digital between the Q2 and an ADAT XT.

## A R T

## Tube MP Personal Preamp Processor

- Power/Peak LED for precision monitoring of power status and clip point.
- Input control has two ranges of gain, +26dB - +60dB and +6dB - +40dB.
- +20dB gain boosts input level for mic usage, or pad for accepting line levels.
- Phantom power supplies power to mics that require +48V phantom power.
- Phase reverse for worry-free multi-microphone placement.
- Output control for trimming back to unity gain.
- Genuine 12AX7 tube shapes and warms the sound of any transducer, from mics to piezo pickups.

## BEHRINGER

### MDX 1200 Autocom

- Attack and release times, with Intelligent Program Detection, prevents common adjustment errors.
- Newly-developed, powerful noise gate.
- Switchable soft knee/hard knee characteristics for varied sound pressure levels.
- Bright, illuminated LEDs show gain reduction.

### MDX 2100 Composer

- Integrated auto/manual compressor, expander & peak limiter.
- Compresses "musically" in dynamic range without any audible "pumping" or "breathing".
- Attack & release times are controlled automatically or manually.
- Interactive Gain Control (IGC) combines a clipper and peak limiter for distortion-free limitation on signal peaks.
- Servo-balanced inputs and outputs are switchable between +4dB and -10dB.



## 4200A and 4400 L-C Series 1/3 Octave Active Equalizers

- The 4200A (active, cut only graphic EQ) and 4400 (active graphic EQ) provide 28 1/3-octave filters on 15 D-centers from 31.5 Hz to 16kHz. Hand-tuned inductor/capacitor (L-C) resonant circuits provide the ultimate in performance and reliability.
- Better than 108 dB signal-to-noise ratio with no degradation even when filters are used.
- Continuously adjustable high and low-pass filters band-limit unwanted subsonic and ultrasonic noise.
- Three outputs and powered accessory crossover socket facilitate distribution and level control to three subsystems. (Bi-amp or tri-amp operation with optional 2-way and 3-way plug-in crossover networks.)
- The 4200A has a -15 dB control range, the 4400 has a ±10 dB control range.

## 4700 1/3 Octave R-C Active Digitally Controlled Equalizer

- Similar in specifications to the 4200A/4400 EQs, the difference is that all functions of the 4700 are digitally controlled.
- Ten non-volatile curve memories and ten preset memories using EPROM, so no need for battery backup.
  - 10dB boost/cut in 0.5dB steps.
  - Adjustable high and low pass filters and gain. (8 steps)
  - Digitally controlled by front panel or remote control.
  - Password access assures security.
  - The control circuits of multiple 4700s can be linked together to form a network of equalizers. The network can be controlled from the first 4700's front panel or optional RS-232, PA422 interfaces. Each network features 10 user programmable presets accessible via computer control, front panel selection or contact closure using the optional Remote Preset Select Interface.

## DSP 5024 Digital Signal Processor

- 2 Input, 4 output signal processor with 107 dB of dynamic range.
- Crossover can be configured as 2-way, 3-way, 4-way or dual 2-way.
- Adjustments can be performed in frequency 1Hz steps, slope (6, 12, 18, 24 dB/oct.), shape (Butterworth, Bessel, Linkwitz-Riley).
- Parametric filters include boost, cut, high pass, low pass, rising shelf and falling shelf, adjustable in 1 Hz steps, 1/10 dB steps and bandwidth from 1/70th octave to 4.8 octaves.
- Delay up to 680 ms on each output.
- Ten non-volatile memories and presets with password security.
- Remote preset select interface includes PA422.

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## JBL

### Control 5 Compact Control Monitor Loudspeaker



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

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

### 4200 Series Studio Monitors

The 4200 Series are console-top monitor models designed specifically for use in the near field. Both the 6.5-inch (4206) and the 8-inch (4208) offer exceptional sonic performance, setting the standard for today's multi-purpose studio environment.

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

### 6208 Near Field Studio Monitor



An internally bi-amplified near field studio monitor, the 6208 provides excellent reference in a small, portable package. It combines optimized electronics with an 8" two-way speaker system on a Multi-Radial baffle that aligns acoustic centers of high and low frequency transducers. The transducers are magnetically shielded to allow safe placement near sensitive equipment such as tape recorders and video monitors.

- Electronically balanced input is compatible with both -10 dBV and +4 dBu nominal operating levels and input connection can be via XLR or 1/4" connectors.
- An electronic, 2.6 kHz crossover, designed specifically to complement the acoustic characteristics of the transducers, leads dual amplifiers utilizing discrete circuitry. The amplifiers feature a low feedback design, with no slew rate limiting and extremely low distortion.
- The eight inch, low frequency transducer delivers a long, linear excursion resulting in a smooth extended bass output with low power compression. It is coupled to a one inch titanium diaphragm, high frequency transducer with patented "diamond pattern surround" exhibiting flat response, +/- 2 db from crossover point to 20 kHz.
- The Multi-Radial(TM) baffle aligns the acoustic centers of the high and low frequency transducers, ensuring that all frequencies arrive at the listening position at precisely the same time. This unique baffle design also greatly reduces diffraction and phase distortions. Dispersion characteristics of the 6208 reduce the effects of changing acoustical environments and achieve consistent, accurate imaging.

## MACKIE

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

Mackie's fanatical approach to pro sound engineering has resulted in the Micro Series 1202-VLZ, an affordable small mixer with studio specifications and rugged construction. It delivers non-compromise, non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio stations, broadcast studios and editing suites—where nothing must ever go wrong.

- Working SN ratio of 90dB, distortion below 0.025% across the entire audio spectrum and +28 dB balanced line drivers
- 4 mono channels with discrete, balanced balanced mic/line inputs and 4 stereo channels (12 inputs total)
- Line inputs and outputs work with any line level, from instrument level, to semi-pro -10dB, to professional +4dB.
- Switchable phantom-powered (48V) inputs for condenser mics
- Every input channel has a gain control, pan pot, low EQ at 80 Hz, high EQ at 12.5 kHz and two aux sends with 20dB gain.
- Master section includes two stereo returns, headphone level control and metering.



### MS1402-VLZ

#### 14 x 2 Compact Mic/Line Mixer

Balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room feature. Nice long 60mm faders, six studio-quality mic preamps and extra Alt 3-4 stereo bus—in less than 1.3 square feet of space.

- Studio grade mic preamps (chs. 1-6) with high headroom, low noise and phantom power. Also incorporate low cut filters to cut mic handling thumps, pops and wind noise. Lets you safely use low shelving EQ on vocals.
- Trim controls (ch. 1-6) with ultra wide range (+10 to -40dB) handle everything from hot digital multitrack feeds to whispering lead singers and older, low output keyboards.
- Pan control with constant loudness and high L/R attenuation so you can pan hard left or right without bleed-through.
- Two aux sends per channel with 15dB extra gain above unity.
- 60mm log-taper faders are accurate along their whole length of travel and employ a new long-wearing contact material for longer fader life & user resistance to dust, smoke etc.
- Control room/phone matrix adds incredible tap monitoring, midxdown and live sound versatility.
- Mute switch routes channel output to extra ALT 3-4 stereo bus. Use if for feeding multitrack recorder channels, creating a subgroup via controlroom/phones matrix, monitoring a signal before bringing it into the main mix or creating a "mix-minus".



The new MS-1202, 1402 and 1604 all include VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for Mackie's acclaimed 8-Bus console series, VLZ effectively reduces thermal noise and minimizes crosstalk by raising current and decreasing resistance.

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

Hands-down choice for major touring groups, studio session players, as well as broadcast and sound contracting. The CR-1604 VLZ features everything you would expect from a larger console, and then some! 24 usable line inputs with special headroom, ultra-low noise Unityplus circuitry, seven AUX sends, 3-band EQ, constant power pan controls, 10-segment LED output metering and discrete front end phantom-powered mic inputs.

- Lowest noise and highest headroom (90 dB working S/N and 100 dB dynamic range)
- Genuine studio-grade, phantom powered, balanced input mic preamps on channels 1-16. All CR-1604 VLZ discrete input mic preamp stages incorporate four conjugate-pair, large-emitter geometry transistors. So, whether recording nature sound effects or heavy metal, mixing flutes or kick drums, you get the quietest, cleanest results possible.
- 3-band EQ with mid-frequency sweep and low cut switch.
- AFL/PFL solo and mute switches with overlock and signal present indicators.
- Rear panel features include insert points and 1/4-inch XLR connectors on every channel, as well as RCA tape inputs/outputs.
- Rotary input/output "pod" allowing three different positions for set-up.



## Digital Multi-Track Recorders

### TASCAM DA-88

- ATF system ensures no tracking errors or loss of synchronization. All eight tracks of audio are perfectly synchronized. It also guarantees perfect tracking and synchronization between all audio tracks on all cassette decks - whether you have one deck or sixteen (up to 128 tracks!)
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48kHz. The frequency response is flat from 20Hz to 20kHz while the dynamic range exceeds 92dB.
- Execute seamless Punch-ins and Punch-outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks to generate special effects or compensate for poor timing.



### SONY PCM-800



- Flawless sound quality, outstanding reliability and professional audio interfacing with AES/EBU digital I/O and XLR analog I/O connections.
- Combines audio functions such as precise auto punch in/out digital cross fade technology, external synchronization with SMPTE/EBU time code and selectable sampling frequencies of 44.1 and 48kHz.
- Shuttle dial for precise tape control, variable speed playback of 6% in 0.1% increments and a flat frequency response from 20Hz to 20kHz.
- Operate up to 16 PCM-800's in perfect sync with optional RSC-S1 sync cables, for up to 128 channels of digital audio recording.
- Optional DABK-801 Sync Board provides SMPTE/EBU time code generation and chase sync. It locks to the incoming time code with subframe accurate offset—ideal for audio-follow-video applications. Also synchronizes to external video reference signal.
- Optional RM-D800 provides comprehensive remote control over all PCM-800 functions. The RM-D800 can control up to six units for up to 48 channels of digital audio.

## ALESIS adat xt

### 8-Track Digital Audio Recorder

An incredibly affordable tool, the ADAT-XT sets the standard in modular digital multitrack recording. With new features and enhanced capabilities, the ADAT-XT operates up to four times faster than the original ADAT, offers an intelligent software-controlled tape transport and provides onboard digital editing and flexible automation.

- Onboard 10-point autolocate system provides quick access to multiple tape locations. Four specialized locate points make your recording sessions quicker and easier.
- Includes remote control with transport and locate functions, offers a footswitch jack for hands-free punch-in.
- Advanced transport software continuously monitors autolocate performance and the head constantly reads ADAT's built-in sample-accurate time code—even in fast wind modes.
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.
- Servo-balanced 56-pin ELCO connector operates at +4dB to interface with consoles with +4 dB balanced inputs/outputs. Also unbalanced -10dB inputs/outputs (phono connectors).
- Has an electronic patch bay built-in so it can be used with stereo and 4-bus consoles.
- Make flawless copy/paste digital edits between machines or even within a single unit. Track Copy feature makes a digital clone of any track (or group of tracks) and copies it to any other track (or group) on the same recorder. Thus allows you to assemble composite tracks for digital editing.



## ALESIS

### Monitor One

#### Near Field Studio Reference Monitor

Designed by engineers with decades of experience, the award winning Monitor One provides the last critical link in the recording studio's signal chain; giving you an accurate reproduction of what is being recorded.

- Delivers excellent image and transient reproduction, powerful bass, and smooth, extended high frequency detail.
- Exclusive SuperPort speaker venting technology eliminates the "choking" effect of port turbulence for solid high-power bass transients and extended low frequency response.
- Ferrofluid cooled 1" silk-dome driver eliminates the harshness and ear fatigue associated with metal or plastic tweeters, making it easy to mix on for extended periods.
- Monitor One's powerful bass incorporates a proprietary 6.5" low frequency driver with a mineral-filled polypropylene cone and a 1.5" voice coil wound on a high-temperature Kapton former.
- They come in a mirror-image left/right pair covered with a non-slip rubber textured laminate for stable mounting.

### Monitor Two

#### Mid Field Studio Reference Monitor

While today's popular music demands more bass at louder volumes than a small near field monitor can possibly produce—the Monitor Two delivers—at a price no higher than many of these smaller speakers.

- Utilizes a 10" three way speaker design with a unique asymmetrical crossover to maintain the same accurate tonal balance and imaging of the Monitor One—but with a much larger sound field.
- 10" low frequency driver incorporates Alesis' SuperPort speaker technology to provide powerful, extended bass.
- 5" mid frequency driver offers exceptional mid frequency detail.
- 1" silk dome high frequency driver delivers a broad but natural frequency response from 40Hz to 18kHz.
- Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy.



## TANNOY

### PBM Series II Reference Monitors

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



#### PBM 5 II

- Custom 5" injection-molded bass driver with a nitrile rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- Woofer blends seamlessly with the 3 1/4" polyimide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring.
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density medite for minimal resonance and features an anti-diffraction radused front baffle design.

#### PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" lowfrequency driver and 3 1/4" tweeter are fed by a completely redesigned hardwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

#### PBM 8 II

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



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## TASCAM DA-P1 Portable DAT Recorder

- Rotary two head design and two direct drive motors for the best transport in its class
- XLR-balanced mic/line inputs (with phantom power) accept signal levels from -60dB to +4dB.
- Analog line inputs & outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enable direct digital transfers
- Uses next generation A/D & D/A converters for amazing quality.
- Supports 32/44.1/48kHz sample rates & SCMS-free recording.
- MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- TRS jack & level control to monitor sound with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter & 1 battery.



## PDR1000/PDR1000TC Professional Portable DAT Recorders



- Direct drive transport with 4 heads for confidence monitoring.
- Balanced XLR mic and line analog inputs and two RCA analog line outputs. Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU balanced XLR.
- Left/Right channel mic input attenuation selector (0dB/-30dB)
- 48V phantom power, built-in limiter & internal monitor speaker
- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status, ID number, tape source status and machine status.
- Supplied Nickel Metal Hydride rechargeable battery powers the PDR1000 for two hours. The battery has no "memory effect" and is charged in two hours with the supplied AC Adapter/charger.

### PDR1000TC Additional Features:

- In addition to all the features of the PDR1000 recorder, the PDR1000TC is equipped to record, generate and reference to time code in all existing international standards
- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
- External synchronization to video, field sync and word sync.

## Fostex D-25 Digital Master Recorder



Professional digital master recorder featuring the confidence monitoring, and insert editing using a 4-head transport. Sync functions for any pro application including the ability to chase sync to a master timecode. The D-25 will resolve to external references such as WORD/VIDEO/DAT frame signal & WORD.

**Features:**

- 16 MBR RAM buffer • Instant Start & Edits • Scrub from tape or buffer • Jog/ Shuttle from 1/2X to 16X • SMPTE/EBU TC generator/reader • On board chase/lock sync • RS-422 slot.
- Independent left/right recording • 4-head 4-motor transport.

## D-30 Digital Master Recorder

The Fostex flagship professional post production DAT recorder, the D-30 contains all the features of the D-25, plus large high resolution backlit LCD display which shows all parameters at a glance; intuitive hierarchical menus from 10 dedicated soft keys; two RS-422 ports for added flexibility.

## Panasonic SV-3800/SV-4100 Professional DAT Recorders



Designed for professional applications, the SV-3800/SV-4100 have highly accurate and reliable transport systems with search speeds up to 400X normal, and 20-bit D/A converters to satisfy the highest professional expectations both in terms of sound and functionality.

## Roland®

### A-90EX Master Controller for the Next Century



The A-90EX is an 88-note, weighted master controller with the best keyboard action currently on the market—bar none. It offers incredibly realistic piano sounds, powerful controller capabilities and "virtual" programmable buttons which can be configured to operate your software and other devices. The A-90EX combines the majestic sound of a concert grand, the expressive action of a fine acoustic keyboard and the comprehensive MIDI functions of a master controller—all in a portable stage unit.

#### Keyboard Controls

- Master volume slider lets you control the volume of your entire MIDI set without changing the balance between connected devices.
- A Global Transpose switch transposes all connected sound sources without changing the transpositional relationship between the individual devices.
- Sequencer Control Section lets you control song selection, tempo and other parameters easily and quickly.

#### Superb Sound

- The A-90EX's sound source is the result of an exhaustive and detailed sampling process. First, the best of the world's finest concert grands were sampled. Then each note was sampled under controlled conditions (mic position, stage and hall acoustics etc.) Only after extensive trial and error were the very best samples selected and incorporated.
- The A-90EX's sound source gives you access to a wide variety of sounds, including two types of stereo-sampled grand pianos, various styles of acoustic and electric pianos (including classic Rhodes sounds) and a generous selection of synthesizer textures.
- The versatility of these sounds is enhanced with 64-voice polyphony—Indispensable for realistic piano sounds, giving you all the capacity you need for lush, sustained passages
- For additional texture, there is also a generous selection of built-in effects, including several types of reverb and chorus.



A compact, stand-alone multi-track disk recorder that provides an amazing array of features at an unbelievably low price. Whether for music production, post production or broadcast, the DM-800 lets you work easier and faster. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing, to rotation track-bouncing, to final mixdown. It fully supports SMPTE and MIDI time codes and also features a built-in Sample Rate Resolver to synchronously lock to any time code.

#### Extensive Performance Configurations

- The A-90EX can store up to 64 Performances, which may consist of up to four of the A-90EX's preset Patches along with various user-configurable parameters such as zone, effects on/off and MIDI channel. Optional M-512E Memory Cards, stores an additional 64 Performances (per card).
- 88 Key Keyboard
- Proprietary 88-note hammer-action keyboard offers the natural resistance and rebound of an acoustic piano.
- Velocity-sensitive, the keyboard brings out every nuance of your dynamics, from pianissimo to forte. Selectable velocity curves let you choose the sensitivity that best suits a particular musical style or sound source.
- Keyboard also offers channel aftertouch-sensitivity - a powerful function for controlling external sound sources.
- The keyboard can be split into eight zones (four internal and four external, or you can assign all eight zones to external devices). It also has 20 different controls and connectors for instant access to internal and external devices.
- Built-In Sounds
- 128 patches from the Roland JD-990, JV-1080, Sound Expansion Series, JV-Series and SR-JV80 Series expansion boards. Customized patch names can also be stored in the database. Optional Voice Expansion boards like the VE-GS1 offer a wide selection of GM and GS sounds and the VE-JV1 offers synth textures from Roland's JV-series synthesizers.

## DM-800

### Digital Audio Workstation



## VS-880

### Digital Studio Workstation

The VS-880 is an integrated digital recorder, mixer, editor and fx processor in one. A complete digital studio workstation, the VS-880 handles everything from data input and recording to mixing and mastering in one superbly styled, compact unit. It provides 64 recordable tracks, CD-quality digital audio and studio-quality multi-effects with the optional VS8F-1 Effect Expansion Board. Storage is accomplished via the internal Iomega Jaz drive. You can record 500 total track minutes or 60 minutes of recording time per track in Standard Mode on one 1GB Jaz disc.

#### Digital Recorder:

- Eight discrete tracks, each with eight "layers" of virtual tracks. Record up to eight "takes" per track for a total of 64 recording tracks. At final mix-down, simply select the best take for each discrete track. You can even compile the best parts from various takes to create a perfect track.
- High-quality 18-bit A/D and D/A conversion, selectable sampling rates include 48, 44.1 or 32 kHz. The VS-880 is a non-linear, random access recorder/editor, so no memory is wasted on unused tracks or blank sections within recorded tracks.

#### Digital Editor:

- Non-destructive recording and editing lets you easily return to any pre-recorded or pre-edited state. You can "undo" up to 999 edits, even after conducting multiple recording/editing sessions. You can redo your song from any desired point instead of going back to the beginning and starting all over.
- Copy, move and replace like using a sequencer or word processor. Cut and paste on one track or on multiple tracks (like track bouncing on an analog machine)—sound quality is always the same no matter how many editing steps are done.
- Compress or expand playback time. Specify time length from 75% to 125% of the original while the original playback pitch remains unaffected.
- Insert a "marker" anywhere in a song (up to 1000 markers) with instant access to any mark. Preview/Scrub functions lets you execute a pin-point search for the first notes or the beginning of a phrase, while you monitor.
- All virtual track performance data can be stored and named as a Song (up to 200 Songs), complete with mixer, effects, mark and locate settings.

#### Studio Effects:

- Optional VS8F-1 Effect Board provides two completely independent stereo multi-effects processors, allowing you to control every aspect of your recording without leaving the digital domain. Access during either recording or mix-down.
- 200 patches (preset & user) based on 20 resident algorithms.
- Effects include everything from delay, reverb and chorus to distortion and speaker emulation. Some feature 3-D sound processing from the Roland Sound Space (RSS) system.
- Guitar effects like overdrive and distortion are included as well as a COSM-based guitar amp simulator.

#### Digital Mixer:

- Digital mixer features 8 + inputs, 8 recording busses, 1 stereo AUX send and 1 stereo master output. A coaxial digital input accepts a stereo (2 + channel mono) digital signal.
- There are 4 analog audio inputs (1/4" phone and RCA jacks).
- You can record up to 6 channels, including 4 analog and 1 digital stereo source simultaneously on 4 tracks. Using the digital coax out, you can archive your final mixes to DAT.
- For the simplest mixer/recorder configuration, the VS-880 gives you an 8-channel mixer with mixer channels and recorder tracks corresponding directly. The Input Mix/Track Mix mode lumps the VS-880 into a 14-channel mixer capable of mixing 6 input sources and 8 recorded tracks at one time.
- Sync sequence data from an external MIDI system, along with 8 recorded tracks, for simultaneous playback and mix-down right on the VS-880; no submixer required.
- Built-in parametric EQ, with all tonal contouring represented on the display for instant confirmation. In Input > Track mode, EQ offers three bands—High (Shelving), Mid (Peaking), and Low (Shelving) and 8 channels. In Input Mix/Track Mix modes, a 2-band EQ is available.
- Every mixer parameter setting, including internal routing and EQ settings, can be captured as a "snapshot." Up to 8 snapshots can be stored and switching among them is as simple as touching a button. Fader movements can be recorded with an external MIDI sequencer for fully automated mix-downs.

#### Other Features:

- Built-in 1G Jaz drive for storage lets you take audio with you—just like tape. Built-in SCSI port offers additional storage capability with SyQuest, MO drives, DAT tape etc.
- MIDI connectors let you sync the VS-880 with a MIDI sequencer, either as a master or slave. Sync through MIDI Time Code or MIDI Machine Control.
- You can record mixer settings and fader movements into a MIDI sequencer. Playing the sequence back, in sync with the VS-880, affords fully automated mix-down capabilities. Has a MIDI Clock—dedicated track independent of the main tracks, so you can even sync to a non-MTC/MC compatible sequencer. Select two VS-880s via MIDI and you'll get a digital recording system with 16 discrete tracks and as many as 128 total tracks.

## SOUNDSCAPE DIGITAL TECHNOLOGY LTD.

### SSHRD-1 Hard Disk Recorder/ Editor



A professional Multitrack Digital Audio Workstation for the PC, the SSHRD1 combines the highest quality processing hardware with easy-to-use Windows-based software for the most complete and affordable solution for high quality digital audio recording and editing on the PC. The SSHRD1 has over 50 powerful editing tools and is expandable from 8 to 128 tracks, with up to 32 inputs and 64 outputs. Ideal for a wide range of applications ranging from, recording music in project studios with an 8 track system, to multiple unit 32, 48 and 64 track systems used by major TV and film studios for audio post production linked to video.

The SSHRD1 consists of two major components, a 19" rack unit which contains all the audio processing hardware and an intuitive and elegant software front end for Windows. The hardware, which connects to the PC via the included host interface card, can record 16 bit digital audio from the analog or digital inputs in stereo and play back up to 8 tracks simultaneously mixed through 2 or 4 analog or digital outputs.

All audio processing, disk handling and synchronization is carried out by the powerful DSP in the hardware, so literally any PC can be used—even a 386 with only 4MB of RAM. By putting all of the processing power into its own hardware instead of relegating it to your PC, the SSHRD1 also frees up your PC and allows it to act merely as a front-end view into the hardware workings. Multiple units can be locked together with sample accuracy, a feature which requires no additional software or hardware upgrades. Soundscape DAWs have "rock solid" synchronization to analog, digital or video tape recorders and even chase time code when varisped is used.

- Using the virtual tracks, up to 64 audio takes can be recorded at the same timing position in an arrangement, allowing for instance, a sub mix of multiple backing/vocal harmonies, dialogue or sound effects to be selected on any physical track later.
- Arrangements are created in the arrange window which display PARTS of a soundtrack and play the actual recorded audio TAKES on disk. A TAKE can be used in different ways by any number of PARTS which can play all or any section of the TAKE. e.g. a chorus vocal can be recorded just once, but used four times within an arrangement. These PARTS build up the soundtrack, and can be edited in a non-destructive way at waveform level "on the fly", even while chasing incoming time code.
- Move, Copy, Trim, Slip, Solo, Repeat, Delete, Cut, Glue edit functions.
- Solo and Multi-track audio scrubbing.
- 999 named markers (insert "on the fly")
- Realtime fade In/Out (8 selectable curves).
- Automated Punch In/Out.
- Volume contouring.
- Powerful noise gate (10 parameters with "floor" settings to remove silence or signals from a mix, ideal for ADT)
- Normalize process to 0dB
- Stereo link tool for stereo editing.
- Varisped ±10%
- Mudge edit using arrow keys.
- Supports all SMPTE formats, including 29.97 and 29.97 Drop frame.
- 9 customizable Tool Pages.
- AVI video file support with full synchronization (requires Video for Window V1.1).
- Optional EDL File support with full auto conform via RS422
- Zoom in/out history (8 levels) Windows V1.1.
- Volume and Pan controls (real-time, non-destructive, with full automation via MIDI)
- Assignable fader grouping
- Merge (stereo digital mix-down)
- Reverse/Phase Invert/Compu tempo.
- Optional Time Module features Time stretch/Time compression Pitch shift and Sample rate conversion.
- Insert Left/Right Locators "on the fly"
- 8 physical output channels, selectable for each PART within a virtual track.
- Non-destructive sample-resolution editing with "glitch-less join"
- Total disc space is dynamically shared by all tracks
- Cycle record mode with stacked TAKES and pre-roll (like analog multi-track tape recorders)
- Synchronization MIDI Song Positioner + MIDI clock or MIDI time code
- Time axis display in SMPTE (hours, min, seconds and frames) or Measure (bars and beats); readout of time between locators
- Arrangements are saved in separate arrange files on the host PC



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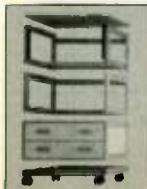
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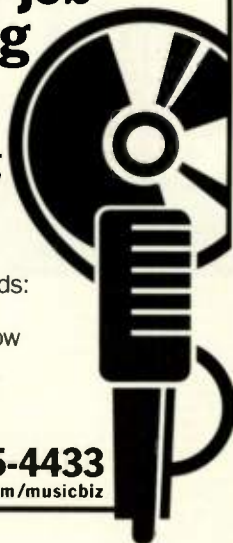
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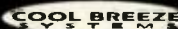
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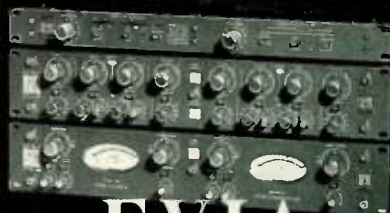
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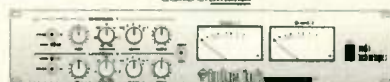
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- Consider the quality of the company's clientele--does it work with professionals--names you recognize? Ask for references.
- Consider how knowledgeable & helpful the company's staff is on the phone: do they know the music business? Are they interested in your project's potential?

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for a more thorough discussion of the topics we've touched on here.

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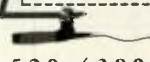
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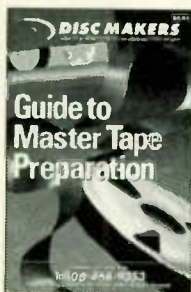
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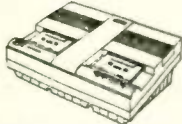
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## THE FEZGUYS

continued from page 118

Tweaking the EQ and varying certain settings at the audio source stage can increase the fidelity of your end product (a topic for another column). For now, set the record level as high as possible without peaking and use your app's "normalize" filter, if it has one. Press Play. Record. Press Stop. Save.

Make sure to choose the correct file format to "save as" for your platform. Macs will record to AIF, Windows will record to WAV. These designations will show up as three letter suffixes on the files' default names. They can be converted back and forth, but, for now, leave them as they are in preparation to encode them for placement on the Web.

If we've done our job correctly, and you have paid attention, you now have an audio file in your hard drive. Play it back and listen closely to it. Headphones are useful here. Experimentation will yield practical information you can put to use in the next column, where we will compress and place the file, discuss different apps that do this, and differentiate between creating a file that is on-demand or stream-enabled. For now, we're going to contin-

ue to use RealAudio as our example case to do this. Their encoder does both across standard platforms, and it's free.

So, to wrap up, we're going to take that audio file in your computer, encode it and place it on the Web. Somewhere. Do you have a place to put it? Talk to your Internet Service Provider (ISP) about their capability to provide space and support for these common technologies. Most ISP's include a small amount of space (usually 2 MB) on their webserver as part of your account. Thus you will have a location on the Web to place your file in and a web address (URL) so that you (and others) can access it.

See you next month. May the Fez be with you!

*Jon Luini (jon@luini.com) was a co-founder of IUMA and currently is a partner/founder of MediaCast and Executive Vice President of Addicted To Noise. Allen Whitman (mermen@mermen.com) is a working musician (bass player/singer) with rudimentary technical knowledge and a keen, real-world interest in the practical use of the Web. Please check out the FezGuys Web site (www.fezguys.com). All columns and info are there.*

## DBX ROAD TEST

continued from page 93

section. The trick is to plug any non-precious EQ into the sidechain *send and return*, boosting the frequency range (while listening via the Monitor switch) until you make the vocal sound worse. Then, when the sidechain is enabled, the EQ is not applied to the main signal, but the limiter's detector circuit will "hear" the way your ear does, limiting the nasty bits and reducing your dependency on mind-altering substances.

*Another Note:* The Contour switch inserts sidechain equalization that reduces subsonic (low) frequencies only in the detector circuit so that the compression isn't strangely modulated by thumps and rumbles. Like the 166A, the 1066 has an expander/gate with its own threshold and ratio controls. For rack and floor toms, a combination of limiting and gating can maximize the attack while minimizing leakage and ringing.

If your budget is tight, the Model 166A is right — particularly as a "dual-mono" unit processing individual tracks. A bit more upscale, the Model 1066 is much more powerful and will do a more thorough job on a mix for the same price that the 166A used to sell for. **EQ**

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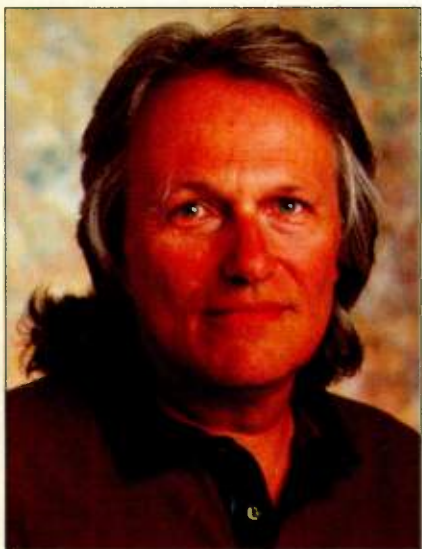
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# Faster Than Light



## All about Holophonic sounds and timing problems

BY ROGER NICHOLS

**I**t is now February 3, 1997, and I am writing my January 1997 column, which has to be turned in by December 9, 1996. (Confused already?) As it turns out, it doesn't matter (the third type of matter along with matter and anti-matter) when you think it is, it just matters when I think it is. When it comes to faster-than-light travel of any kind, it is always based on the reference point involved.

As an example, consider a shadow, that dark spot that is left behind when you place something in front of a light source. Put your finger about three inches from a light bulb and look at the shadow on the wall. Move your finger over about two inches so that the shadow now falls somewhere else on the wall. The shadow on the wall is moving hundreds of times faster than your finger. If the shadow is further

away from the light source, then the shadow will move even faster. If you move the wall far enough away from the light source, the shadow will be moving faster than the speed of light. I am at this very moment trying to figure out how to apply this to digital delays.

I have figured out how to compensate for some of the delay in MIDI sequencing. I took two identical MIDI sequencers, started the sequences at the same time, and then shipped one of them via FedEx and the other one via UPS. They were routed around the world in opposite directions and scheduled for Saturday delivery back here in Nashville. When they returned, I noticed that the one that traveled eastbound was 0.000001 seconds ahead of the one that traveled around the world in the westerly direction. I also noticed that the eastbound package carrier charged me for an extra day because of the International Date Line crossing.

It has been known for quite some time that sound travels faster in water than in air. My first experiments have been with water-filled audio cables. Actually, I just ran some speaker wire through a garden hose. The sound was much cleaner and my overheated voice coils were cooled by the leaks. Wharfdale, an English speaker manufacturer, used to fill their speaker cabinets with sand. My next project will be to fill my speaker cabinets with water. As a matter of fact, I plan on using heavy water, D2O. Now that I think about it, they used to power the Wharfdales with Leak amplifiers.

### HOLOPHONIC SOUND

About 15 years ago, I heard a demo of a 3D sound system called Holophonics. The recordings were done with a binaural head and processing electronics that retained the imaging cues needed by the human brain. One of the demo recordings was of a person cutting your hair. The image sounded like it was coming from behind and above. My initial reaction was that the cues were psychoacoustic. Your brain must be saying that the image is behind you because your hair is behind you. I dismissed the system as cute, but not something I would be able to use in every day recordings.

A couple of months ago I was in Buenos Aires for an audio expo and ran into a fellow named Christian who wanted to show me the system again. I agreed, and went over to his house to listen to the sys-

tem. I thought it would be another bout with the demo recordings. I was wrong. He had a Holophonics head named Ringo and the associated processing unit. I was able to listen through headphones to the live signal from the head microphones through the Holophonics processor. It was amazing.

The spatial perception was as close to perfect as you could possibly hope for. With my eyes closed, I could easily tell whether Christian was behind me (OK, I kept one eye open for that part), to the right, to the left, standing on a chair, or crouched down near the floor. He walked into another room, and I could tell that he then walked down a hall off to the right from the attached room. I also had 3D perception of sounds that were outside of the house. A plane flew over the house and I could tell that the plane was coming from my right and was to the west of the house. When a car passed by the house, I could tell which street it was on and which way it was going.

For comparison, Christian turned off the processor so that I was only fed the binaural signal from the head. I could no longer discern up or down, and front to back was very difficult. Left to right seemed to be pretty good, but the quality was muddy due to the ambience of the room.

Your brain can easily ignore extraneous sounds because you can tell where they are coming from and disregard them if they are not necessary for the information at the focus of your attention. With binaural recordings and other 3D systems that I have heard, your brain does not receive enough information for processing. With the Holophonic system, the correct information is preserved to enable your brain to do what it is very good at, throwing away unwanted information.

Holophonics requires no decoding during playback and also works very good with speakers. A couple of major movie companies are looking seriously at incorporating Holophonics into film soundtracks. Initial tests show that the 3D space in the movie theater is 10 times more realistic than with current surround systems. Watch this space for further developments.

### TIME MARCH IS ON

As they say, "Time is fun if you are having flies." It seems like I just got here and it is time to go. If my next column was going to be about sex and audio, how could I safely broach such a subject? Answer: With an ample supply of conundrums. **EQ**



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*In addition to being a sound designer for the Hollywood Bowl Joseph Magee records and mixes for film, and in 1995 received a Grammy nomination as a producer/engineer.*

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