New PC RECORDING Tips

EQ

THE PROJECT RECORDING & SOUND MAGAZINE

FEBRUARY 1997

ROGER NICHOLS: JUNK FOOD DIARIES

AL KOOPER: NAMM-ARAMA

CRAIG ANDERTON: MIDI-LAND NEWS

EDDIE CILETTI: MASTERING PIECES

LUINI & WHITMAN: WEB AUDIO

MARTIN POLON: STUDIO TAX TIPS

456

RHYTHM & BELOW

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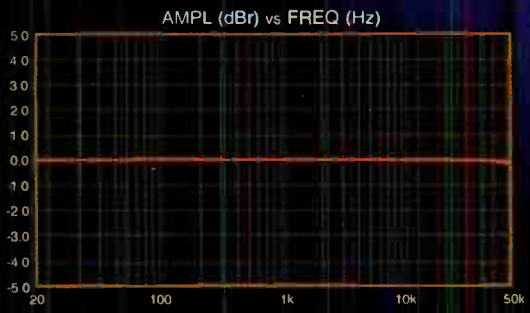
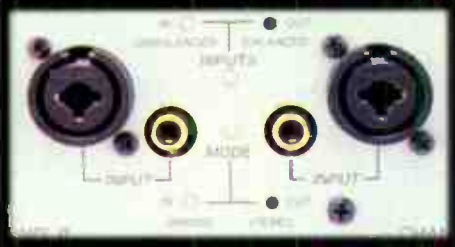
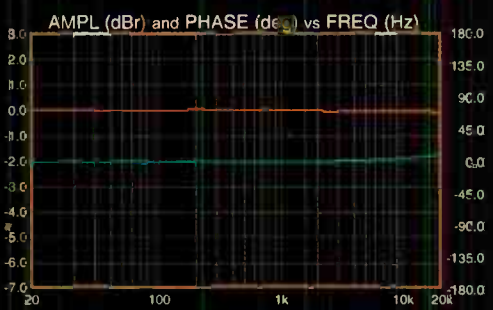


The RP™ 500 MOSFET studio reference power amplifier gives you the purest audio signal that money can buy. Throughout its development process, close attention was paid to every detail to ensure superior sonic performance. The RP 500 is accurate, translating into a perfect mix!



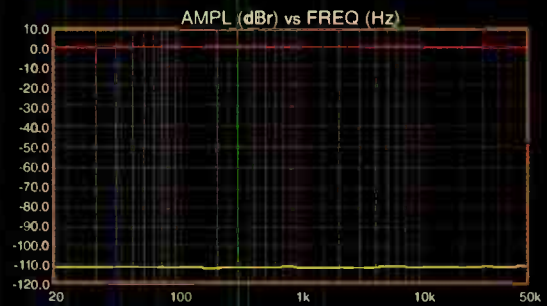
Frequency response, phase and signal-to-noise are technical terms that may make your brain hurt to think about, but they mean everything to the accuracy of your mix. Many amplifier companies strive for excellence in one area, being excellent in all of these is what makes the RP 500 the perfect studio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



Frequency Response

Phase

Noise Floor



PURE IMAGE

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

IT'S SILENT!

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EQ

PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 8, ISSUE 2
FEBRUARY 1997

ON THE COVER: *Adrian Belew sits in his project studio. Photo by Beth Gwinn.*

FEATURES

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Fretboard master Adrian Belew takes *EQ* inside his project studio where he recorded his new solo album, *Op Zop Too Wah*, as well as produced Jars Of Clay's hit song "Flood."

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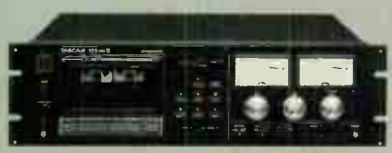

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The **Write** *Stuff*

EQ welcomes some new names and faces

Blame it all on **Roger Nichols**. He proved that someone who really knew his stuff in a studio could write a column month-after-month for over five years without ever missing a deadline, getting sued, or using his press pass for illicit purposes — and, yes, that readers will actually read the last page of a magazine first.

Of course, there was also **Craig Anderton**, who signed on with *EQ* quite early, as one of the pioneer believers in the fact that the world actually needed a magazine dedicated to project recording and sound techniques. And along the way we added other popular know-it-alls like **Eddie Ciletti** and **Martin Polon** to our list of columnists.

These erstwhile writers give a voice to every issue of *EQ*. Sandwiched between the how-to articles, the reviews, the product reports, and the techniques, you discover these unique and peculiar personalities who somehow, someway figure out how to come up with something fresh, inspiring (and sometimes annoying) month-after-month, while they still find time to write books, make records, and make stuff work. It's a hard job and, as the magazine continues to grow, we're always on the lookout for other names and faces who can pull it off.

Well, we've found some more. Those of you who have been reading closely have noticed the addition of **Jon Luini** and **Allen Whitman** to the back of the book. These self-proclaimed FezGuys have brought *EQ* the most practical guide to producing audio for the web that you'll find in any magazine. And their Web site (http://www.fezguys.com) propels what they say in print into cyberspace. May the Fez be with you.

Next on board was **Al Kooper** who recently found a home in our pages (now that he's been run out of Nashville). Sure he's got an attitude (not to mention a sense of humor and decades worth of album credits). And sure he's going to inspire, incite, and infuriate. But that's what great columnists are all about. If you still don't know who Al Kooper is, we're still not going to tell you.

This month *EQ* is proud to welcome **Mr. Bonzai** to its pages. His interview with "Weird" Al Yankovic is just a taste of the quirky, bizarre, and wacky Q&As that he has been feeding readers for breakfast over at *MIX* for so many years. Expect bolder, bigger, and more bountiful stuff from this prodigious pro-audio spokesman as his column, The Bonzai Beat, builds up speed exclusively in *EQ* in the months ahead.

Who's next? Well, **Phil Ramone** promised us that one of these days, if things ever got slow (yeah, or when hell freezes over)... And we're still hot on the trail of **George Massenburg** (maybe, after he designs his dream console)... And that **Clearmountain** guy sure can write (if only they'd design a word processor with faders)...And...

—The Editors

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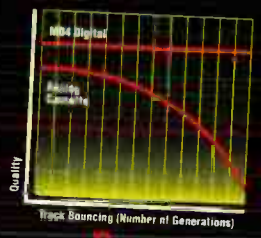

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Photo by Jim Ainge

GETTING A LOAD OFF: Is Bob Rock the reason for Metallica's successes?

MIX UP

First off, I want to say how much I enjoy your magazine. I read the Dec. 1996 EQ&A about "ADATS & Polarity" and was jumping with joy from the response.

I am the owner and operator of a small studio in Memphis, TN where we specialize in acoustic (not something you shoot pool with) music, mainly bluegrass. Recently I did a live recording for a major bluegrass band to be used by a major label for national release. We have 16 tracks of ADAT-OF and 16 tracks of ADAT-XT available. We chose to use XT for this project.

After completion, I sent the track tapes to the band. They were taking them to a local studio near their home to listen and mix. I received a call from them saying there were all kinds of problems — they thought it might have been in the compression — but they had no idea. They said it sounded great here, but wondered what happened when they got the tapes.

Obviously that made me question my own abilities and fear my future in the recording industry. That afternoon I got my Dec. issue, found the EQ&A, and, after calling them back, I found out they were indeed listening to the tapes on ADAT-OF. I got the tapes back and put them in the XT — they sounded great. I then put them in the OF and they *sucked*. Don't get me wrong, I don't hate my OF, but if you record on one format, *stick with it for mixdown!* Otherwise, you'll suffer the consequences.

Terry Eubanks
The Loft Recording Studio
Memphis, TN

BROWN NOSING

The article on producer Tony Brown in the October '96 issue was really great. I think he's one of the best producers in the music industry — I hope in my future I grow to be successful as he is. The article written by Ms. Beverly Keel was also really interesting to read. Thanks for your time and keep up the good work. The Web site is great.

Gregg Di Stefano
So. Fallsburg, NY

KRAZY FOR KOOPER

I just wanted you guys to know that I find your new "Kooper's Kouch" fascinating and enjoyable. The insights that can be shared by Al Kooper are worth getting your magazine in itself. Thanks again.

Bradford Simpson
Systems Technician
ProMix Inc.
Orlando, FL

GETTING A LOAD OFF

After reading your interview with Bob Rock, it seems the last two Metallica albums should have been called "Bob Rock featuring Metallica" vol. I and II. Without all the splicing, editing, and extra stuff, I don't think Metallica could produce a turd. Bob Rock should be paid well for making these albums as successful as they are.

Moon
via the Internet

PROSE PRAISE

EQ is the best all-around magazine on the market, and I tried 'em all over many years. Best gang of writers on this planet.

I am a David Tornesque multi-layered Jam-Man "Looper-MIDI guitarist," yet I get more usable info from you than any "guitar" mag. Most guitarists and music retailers have no idea what can be done with this glorious new sophisticated equipment. I need to live another lifetime to watch the amazing progress we are witnessing in hardware-software, etc. Carry on, and on, and on...

Joseph D'Annunzio
Audubon, PA

CALENDAR GUY

EQ's 1997 Microphile Calendar and December issue made it through the snail-mail seasonal slowness to my address in Northern California today.

I always appreciate the new products and features sections in your mag. Finding the calendar, though, was like the nice surprise of coming across a gold coin wedged inside my mixer: best when pulled out, easy on the eyes, and quite keepable.

Thanks.

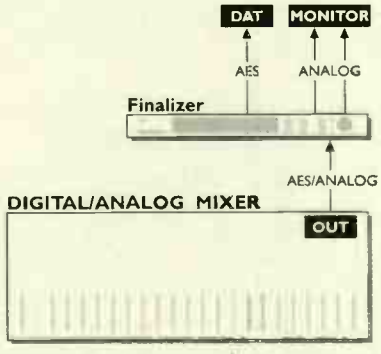
Ken Boone
Family Programs, Inc.

COMPARISON SHOPPING

I love your mag. I've been a subscriber

World Radio History

Want your mixes to deliver the punch and clarity of the industry heavyweights? Now you can... thanks to the Finalizer™, TC's new concept in dynamics signal processing. Inserted between the stereo output of your mixer and your master recording media, the Finalizer dramatically increases the volume without sacrificing fidelity or stereo imaging.



The Finalizer creates that extra energy boost that you otherwise only can get from a professional mastering house. With its powerful multiband processing it will make *your* mixes sound **punchier**, ***louder***, **crisper, warmer,** spectrally balanced, more **"in your face"**... it's your choice!

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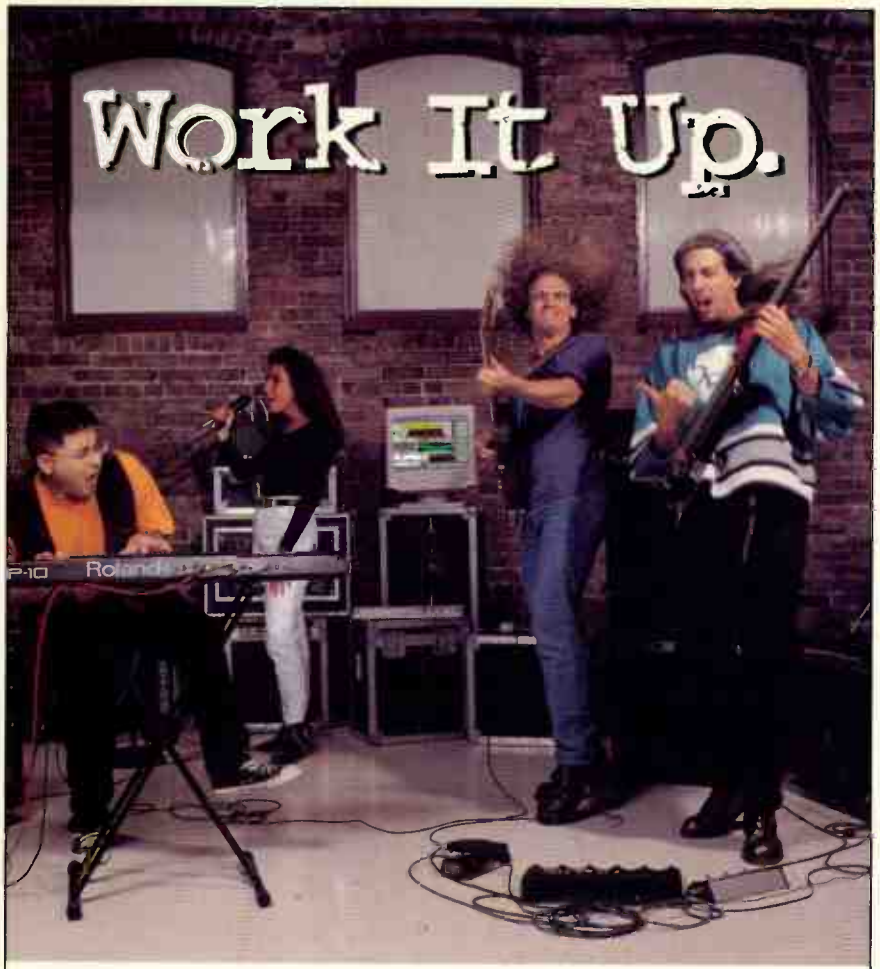

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CIRCLE 25 ON FREE INFO CARD

for a while now. I remember the first issue and have tracked the development since. I get all the others like *Electronic Musician*, *Keyboard*, *Recording*, and *MIX*, and I have to say that I enjoy *EQ* best because you seem to dig deeper into topics. Put simply, I learn something from every issue. The others are always written for the beginner (except *MIX*). Anyway, keep it up, I smile every time I see an *EQ* in my mailbox!

Gary Galimidi
Miami, FL

BETA TESTER

I just read the review of the Shure Beta 56 Series in your December '96 issue. It's too bad you only tried them on drums. I use mine on my guitar amp and on my steel amp, and what a difference they make. They are the best mics ever for this application, although, as you said, placement for these mics is very important.

I've tried everything from DIs to hanging SM57/'58's in front of my amps, and the Beta 56's are the best. So don't sell them short on just acoustic replication.

Thomas Chasten
Anchorage, AK

CORRECTION

In the profile of NYC club Tramp's monitor sysem in the December issue, the opening paragraph regarding the Jack Weissberg prototype speakers should have read: "They were a Jack Weissberg prototype (a good box about the same size as a Meyer Sound UPA) with a 1-inch TAD driver, a 10-inch (front loaded) midrange speaker, and a 12-inch low-mid driver loaded pointing down in the cabinet."

WRITE TO US

Send your letters to:
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World Radio History

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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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EQ&A

JUST STAY WET

Q I own a TASCAM 488mkII. Every time I hook up effects in stereo, I lose the panning in that track. Yes, the effects are in stereo. Yes, the effect comes out of both speakers. Still, only when I use no effects at all can I use the pan control. Yes, I'm stupid, but what am I doing wrong?

Frontiers
via the Internet

A Whoa! Stop being so hard on yourself. It's only rock 'n' roll... My guess is that your effects device is set to "MIX," which would combine the wet and dry signals together. You are most likely returning both channels of the effects to Return Left and Return Right. Try setting the effects device to output the processed, or "WET," signal only.

Eddie Ciletti
Contributing Editor
EQ magazine

CRAZED CURRENT

Q I am the video engineer on a national tour, and have an electrical distribution question. At a recent date, the video and sound systems shared an electrical service. During soundcheck I noticed some odd voltage and current fluctuations on my Furman meters. As the sound system boomed away, the current readings on my Furman AR Pros dropped. Downstream, the Furman PL Plus showed a voltage drop down into the red to the point that the lights in the rocker switches went out. However, my Fluke volt meter showed no voltage change on the outlets. Back at the power distro, the voltage reading went up during volume peaks. The sound distro showed no voltage change at all. What caused these readings? No one on tour knew — not even the house electrician. We turned everything up to 11 and it all still worked, so it was agreed that all was OK. But I would still like to know.

Tour Details: 400-amp/3-phase service; 115/230 volts; sound draws 25 amp/leg at idle, 180 amps at peak. Video draws 70 amps/leg; one 30-amp five-wire feeds three Furman AR Pros (one per leg); Furman PL Plus downstream feeds the gear; AR Pro shows 120 volts and current from 13 dropping to 6 amps with sound peak; PL Plus show voltage drop.

Paul Whitfield
Nashville, TN

A It sounds like the root of the problem is the unbalancing of the three-phase transformer during the periods of high-current draw. Rearranging the distribution of loads (if possible) would help the situation.

In addition, you may want to monitor your AC waveform to determine the amount of harmonic distortion, and what the power factor is. These are both compromised because of the nature of the load (reactive). You might be able to apply some power factor correction, but that's a subject your utility company should be consulted about.

If there was very high harmonic content, the power waveform could have been so distorted that it "fooled" the PL meters into thinking the power was low, when, in fact, it was not. The third harmonic phase components in a three-phase system are in phase with the fundamental and flow through the neutrals of the system. That would include all of your Furman AR Pros.

Gary Kephart
Director of Engineering
Furman Sound, Inc.

A SNAKE IN YOUR PLANS?

Q I am looking for sources and prices on snake lines for connection over long runs from inputs to mixer. Could you send me info on where I could find these devices?

Peter Chase
Jordan, MN

A There are a fair number of manufacturers that should be able to satisfy your request. Call them and ask for the location of local cable dealers. That way you can go into the stores and be certain the snakes will do the job you want them to do. Also, check out the ads in *EQ* for additional information. (Yes, sometimes reading those ads really does pay off....)

Here are a few snake contacts, including a couple which can supply the cable and connectors should you want to build your own custom snake: Whirlwind (Tel: 716-663-8820);

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Wireworks Corp. (Tel: 908-686-7400); Yale Electronics (Tel: 213-465-3186); Belden Wire & Cable (Tel: 317-983-5200); Gepco International, Inc. (Tel: 312-733-9555); and CableTek Electronics Ltd. (Tel: 604-942-1001).

Hector La Torre
Executive Director

HOOKED ON SPEED

Q *I have owned a TASCAM DA-30 for about four years, and it has always performed flawlessly. Lately, however, when I press Play or Record, sometimes it will play (or record) at a speed somewhere between play and fast-forward. If I am recording, the time seems to be displayed accurately, but when I press Stop and Rewind, the display sort of "geeks out" until it reaches the point at which I started recording. If I play back the recorded material, I hear only digital noise and the display does not show the correct time.*

This problem is sporadic, but is becoming more frequent. Before I take it in for service ($$$), I thought I'd see if you guys might have an idea what's wrong.

Jared Jensen
via the Internet

A Without physically inspecting your DA-30 it's difficult to be certain, but the symptoms you describe appear to be indicative of a malfunctioning Transport Mode switch. After four years of use, this switch may need to be cleaned so that better contact is made — or it may require replacement. Either way, you should return your DA-30 to an authorized TASCAM service facility to know for certain.

Roger Maycock
Marketing Support Representative
TASCAM

NO ANALOG ALLOWED

Q *I am looking for a device that can convert digital audio between a Panasonic SV3800 DAT and the Alesis ADAT without going D/A–A/D. Any products that you know of?*

Bruce Tuszynski
via the Internet

A What you need is a digital audio format converter. While the Alesis ADAT uses a proprietary digital transfer protocol based on fiber optic technology (the ADAT MultiChannel Optical Digital Interface), many DAT machines and other digital audio tools implement standardized interfaces such as AES/EBU or the more consumer-level S/PDIF interface.

Until recently, Alesis manufactured a product called the AI-1, designed specifically for the purpose you described above. The AI-1 was both a digital interface between the ADAT Optical protocol and AES/EBU or S/PDIF formats as well as a sample-rate converter between 48 kHz and 44.1 kHz rates. Unfortunately, due to underwhelming lack of demand for this seemingly valuable tool, Alesis was forced to discontinue this product. You may want to check with your professional audio dealer to see if they still have an AI-1 in stock, as it remains the least expensive device that can perform digital format/sample-rate conversion for ADAT.

If they don't, do not despair; there are other devices which will accomplish the same job. Two of these products are the Spectral Translator Plus [*see Eddie Ciletti's review in the December '96 issue*] and the Kurzweil DMTi. The Spectral Translator Plus will convert your digital audio signal between ADAT and several other formats, including AES/EBU, Yamaha's Y2 format, and more. The DMTi offers an even greater variety of convertible formats, including Kurzweil's proprietary format for their keyboards. Both devices also provide sample-rate conversion.

The good news is that more and more manufacturers are implementing the ADAT Optical format into their own products, so that direct digital connection is as easy as plugging in an inexpensive fiber-optic cable. Over 100 companies now make ADAT-compatible products that include popular digital mixers, keyboards, signal processors, disc recorders, and much more.

Jeff Klopmeyer
Advertising/Promotion Manager
Alesis Corporation

ASK US!

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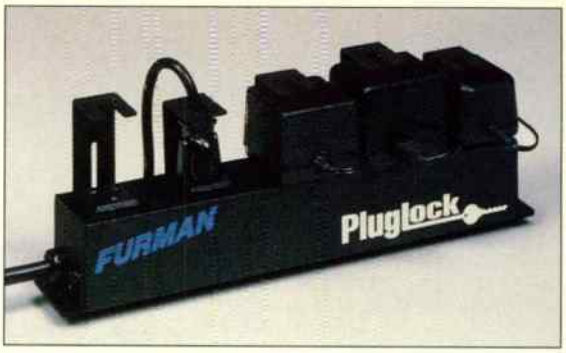
FROG STOMP



Furman's new PlugLock AC outlet strip offers an adjustable forked clamp over each socket to securely lock up to five wall-wart transformers in place so they won't fall out. The forks also make it possible to lock ordinary plugs in place. Furman has designed the PlugLock strips so they can be mounted safely out of sight, in the back of a rack. Each strip comes with a heavy duty 5-foot, 14-gauge, and is three-conductor cord, circuit-breaker protected, and rated at 15 amps. The suggested retail price for the PlugLock AC outlet strip is $58. For more information, contact Furman Sound, Inc., 30 Rich St., Greenbrae, CA 94904. Tel: 415-927-1225. Circle EQ free lit. #101.

GIMME AN "S"

Otari's DTR-8S professional DAT machine incorporates all the features of the DTR-8 machine along with the added capability of monitoring input signal without the need to have a DAT tape in the unit. The DTR-8S has +4 dBu (–10 dBv switchable) active balanced analog I/O with XLR-type connectors and has both AES/EBU and S/PDIF digital I/O. In search mode, the DTR-8S uses TOC information from tape to locate up to 300 times normal play speed. The sampling rates (48 kHz, 44.1 kHz, and 32 kHz) are switchable from the front panel. Other standard Otari features include an hour meter to help scheduled maintenance, rack-mount adapters, wireless remote control, and parallel remote control capabilities. The DTR-8S features a suggested retail price of $1395. For further details, contact Otari Corporation, 378 Vintage Park Drive, Foster City, CA 94404. Tel: 415-341-5900. Circle EQ free lit. #102.

THE MISSING LINK

Unlike other similar products, the new system PatchLink SP modular patching system from Neutrik holds the PC board within a cage-like panel, completely protecting the PC card and eliminating unscrewing a nut for each individual card on the back. Half normalled jacks are visually identified by a light grey color so they can be easily identified. With each vertical front-to-back pair half normalled to the other, the orientation of the circuit board allows different combinations of interface. Orientation is accomplished by unscrewing the front-panel screws and turning the PCB around. The PatchLink SP is available in a black matte finish and features identification strips on the back as well as the front. For more information on the PatchLink SP, contact Neutrik USA, 195 Lehigh Avenue, Lakewood, NJ 08701. Tel: 908-901-9488. Circle EQ free lit. #103.

BREATHING ROOM

Instead of a limited play, 4-track system that relies on digital compression schemes, Fostex's DMT-8VL offers eight uncompressed digital audio tracks, a full-featured analog mixing console, and Fostex's hard-drive-based architecture. The DMT-8VL provides users with eight tracks of 16-bit, 44.1 kHz uncompressed digital audio and boasts 18-bit, 128X oversampling A-to-D conversion, and 20-bit D-to-A converters. Each channel of the DMT-8VL has an input channel select switch, a long-throw 80-millimeter fader for level settings, and a stereo inline monitor section, as well as direct inputs and outputs, and independent monitor outputs. The DMT-8VL has a suggested retail price of $1295. For more information, contact Fostex Corporation of America, 15431 Blackburn Ave., Norwalk, CA 90650. Tel: 310-921-1112. Circle EQ free lit. #104.

World Radio History

FOR THE TUBE-LOVER IN YOU

The Summit Audio TPA-200B is a dual-channel vacuum tube mic, line, and Hi-Z preamp. The unit employs selected 12AX7 vacuum tubes combined with 990 operational amplifiers, integrated circuits, and transistors to provide a reliable device with the warm sound of tubes. The TPA-200B's front panel offers input and output gain control; line/mic, insertable pad and phase reverse switching; overload and overdrive indicators; and 1/4-inch, unbalanced phone jack Hi-Z input. The back-panel mic and line inputs are transformer-based three-pin XLR type, while the outputs are electrically balanced or unbalanced yielding a maximum output level of +25 dBm. For more information, contact Summit Audio Inc., P.O. Box 1678, Los Gatos, CA, 95031. Tel: 408-464-2448. Circle EQ free lit. #105.

WHAT A RUSH

Designed to look and feel more like a traditional guitar amplifier than an effects unit, DigiTech's 2112 is a fully-programmable tube guitar preamp and multieffects processor for studio or live applications. The 2112 features dual distortion paths that allow the unit's tube distortion (using two 12AX7's) and solid-state distortion to be run in parallel, offering two separate signal paths. Based on the operating system of DigiTech's Studio Quad, the 2112 utilizes two S-DISC II Processing chips to provide seamless program changes, allowing delays and reverbs to fully decay even after the program has been changed. Effects include: compression, analog wah, tube distortion, solid-state distortions, digital EQ, noise gates, reverbs, choruses, flangers, intelligent and smooth pitch shifters, detuners, smooth whammy effects, phasers, tremolos, auto panners, rotary speaker emulation, cabinet emulation, and more. For more details, contact DigiTech, 8760 South Sandy Parkway, Sandy, UT 84070. Tel: 801-566-8800. Circle EQ free lit. #106.

THE MINI MEDIA

HHB has designed a 140 MB data MiniDisc, the HHB MDD140. The MDD140 has been specified, developed, and tested specifically for use in professional audio applications, providing users with dependable and cost-effective recording media and the assurance of compatibility with all available hardware — Sony, TASCAM, and Yamaha digital 8-track MD machines. The MDD140 has been designed to excel in the critical areas of high carrier-to-noise ratio and low block error rates. For more details, contact HHB Communications, Inc., 43 Deerfield Road, Portland, ME 04101. Tel: 207-773-2424. Circle EQ free lit. #107.

BELLARI, WHOA WHOA WHOA WHOA

The RP533 studio tube multiprocessor utilizes Bellari's tube mic preamp circuit with a transformer-balanced input for its preamp section. Bellari has also included +48-volt phantom power for use with condenser microphones. A sidechain input and output is included for direct access to the compressor detector circuits. The meter can be switched in the circuit path to show the input level, output level, or compressor gain reduction. The unit has 1/4-inch and XLR inputs and outputs for a variety of input/output options. The RP533 carries a retail price of $700. For more information, contact Rolls Corporation, 5143 South Main Street, Salt Lake City, UT, 84107. Tel: 801-263-9053. Web: www.xmission.com/~rollsefx. Circle EQ free lit. #108.

World Radio History

VIRTUAL BANDMATES

Akai's MPC2000 MIDI Production Center features 16 pressure-sensitive drum pads, 100,000-note sequencer capability, and an increased RAM capacity of 32 MB. The MPC2000's sampling, sequencing, and editing horsepower is controlled via an advanced menu-driven 248 x 60 LCD featuring graphic waveform display and editing functions. Akai is also offering such options as SampleVerb, Akai's 4-bus voice-assignable effects processor, a SMPTE reader-generator, and the Multi 8/Dm, which adds eight individual outputs and S/PDIF digital I/O. The MPC2000 is available in three versions. The base unit features 16-bit, 44.1 kHz stereo sampling, 2 MB RAM, SCSI, and stereo outputs. The MPC2000 Studio adds eight individual outputs plus S/PDIF, digital I/O, and SMPTE. The MPC2000 Studio Plus improves upon the MPC2000 Studio with the addition of the SampleVerb 4-bus assignable effects processor. Price is $1495. For more information, contact Akai Professional/Digital, 1316 East Lancaster Ave., Fort Worth, TX 76102. Tel: 817-336-5114. Circle EQ free lit. #109.

A BOX O' BLUE...

From the dbx Blue Series comes the 160S stereo compressor limiter. The 2U 160S's signal path consists of a high-precision input stage followed by the dbx V8 VCA (which dbx claims is the world's widest range voltage control amplifier), and an output stage with precise phase alignment at all audio frequencies. The unit features both hard-knee and classic dbx OverEasy compression, as well as attack and release controls and the traditional dbx program-dependent time constants. The 160S boasts a low distortion (<0.002%), high CMRR (>100 dB), wide bandwidth (>200 kHz), and a wide input common-mode range amplifier configuration for its input stage (maximum input signal level >+30 dBu). Two output options are available for the 160S; an analog card that parallels one extra high drive output per channel acting as a premium signal splitter, and a digital Type IV Conversion System card to provide analog-to-digital conversion. For more information, contact dbx Professional Products, 8760 South Sandy Parkway, Sandy, UT 84070. Tel: 801-568-7660. Circle EQ free lit. #110.

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

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.

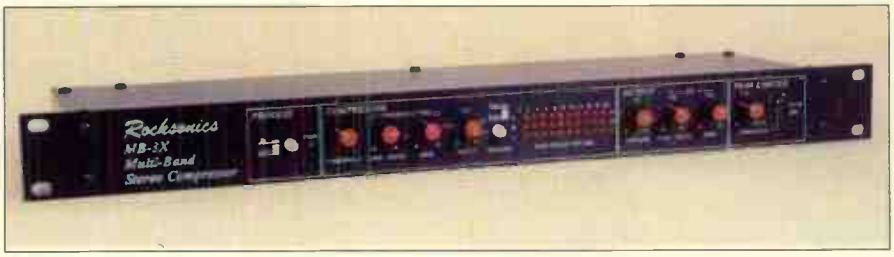
107: The award winning, #1 selling Tubessence mic preamp is the perfect marriage of solid state and vacuum tube circuitry. Upgrade the sound of all your mics with uncolored detail, presence and warmth.

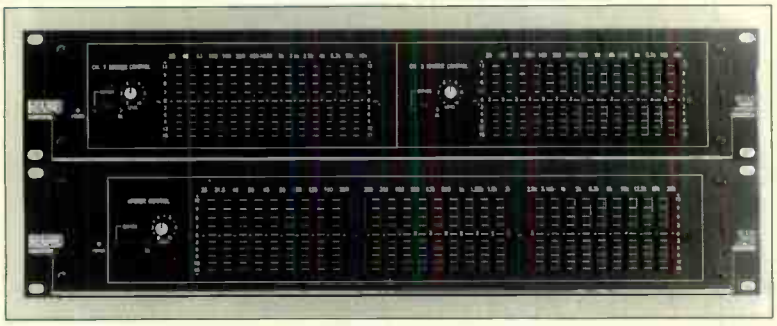
These products are covered by one or more of the following U.S. Patent Numbers: 4150253, 5359665, 5334947, 5450034, 5424488, 5483600.

World Radio History

THE OL' TRIPLE PLAY

Rocksonics MB-3x multiband stereo compressor works on three frequency bands (lows, mids, and highs) by splitting the audio signal into the three frequency bands and compressing each band separately. Rocksonics utilizes three distinct filters and compressors to provide a very tight, predictable amount of compression. The MB-3x also offers a post-compressor "brick wall" peak limiter that makes sure that the MB-3x output never exceeds the desired level. The suggested list price of the MB-3x is $599. For more details, contact Rocksonics, P.O. Box 442, Los Alamitos, CA 90720. Tel: 714-901-9238. Circle EQ free lit. #111.





PLAYIN' IN THE BAND(S)

Rane recently introduced the GE 215 and GE 130 graphic equalizers. The GE 215 is a two-channel, two-thirds octave unit, and the GE 130 is a single-channel, one-third octave unit. Both EQs feature 45 mm sliders, constant Q filters, level controls, fail-safe bypass switches, and overload indicators. Inputs and outputs are provided with full-balanced 3-pin (XLR) and quick-disconnect Euroblock connectors. Both the GE 215 and GE 130 are double space, 19-inch rackmount devices with UL/CSA power supplies and CE certification. The suggested retail price of the GE 215 is $599, while the suggested retail price of the GE 130 is $529. For more information, contact the Rane Corporation, 10802 47th Avenue West, Mukilteo, WA 98275-5098. Tel: 206-355-6000. Circle EQ free lit. #112.

...at a price you won't believe

107 Aphex Tubessence Mic PreAmp - 2 channel

109 Aphex Tubessence Parametric Equalizer

105 Aphex Logic Assist™ - 4 Channel Gate

Is there really a tube in there?

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

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

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

World Radio History

EQ PRODUCT VIEWS

RAMSA ON

Ramsa has made some additions to its 4400 Series of consoles. The 4400S Series consoles offer many new features such as stereo inputs, dual inputs per channel, and an aux send. The 4400S family includes three models: the 12-channel WR-S4412S, the 16-channel WR-S4416S, and the 24-channel WR-S4424S. Each 4400S configuration incorporates four stereo inputs. In addition, all channels are equipped with an A and B input, thus allowing a maximum of eight stereo units to be connected. The consoles feature four main groups plus left and right stereo sends from each input. Four group masters plus L/R stereo master faders allow easy subgrouping or tracking and full control of aux sends. For more information, contact Ramsa, 11999 San Vicente Blvd., 4th Floor, Los Angeles, CA 90049. Tel: 310-471-6170. Circle EQ free lit. #113.

THE BBE ALL AND END ALL

The DI-100 is a new direct box from BBE with built-in Sonic Maximizer. It offers independent process and low contour controls for added clarity, tone, and definition to acoustic, electric and bass guitars, keyboards, other instruments or line-level sources. The DI-100 can also be used as a stand-alone instrument preamp or as a single-channel BBE Sonic Maximizer for live-sound recording. When the DI-100 is powered by a 9-volt battery, 9-volt power supply, or 48-volt phantom power, the internal circuitry automatically scans the unit before locking into the strongest sources and shutting down access to the other two sources to prevent possible damage. The DI-100 accepts a line-level signal input via a 1/4-inch jack and also has a balanced XLR output for mic level. For more information, contact BBE, 5381 Production Drive, Huntington Beach, CA 92649. Tel: 7140897-6766. Circle EQ free lit. #114.

TICKLE THE DIGITAL IVORIES

Fatar's new Studio ST-1176 76-note, weighted-action MIDI keyboard controller is lighter and smaller than its 88-note sister keyboard controllers, and features 32 presets that can be stored via sys ex, bank select options, and pitch and modulation wheels. Any of the ST-1176's 120 controller values can be assigned to a programmable slider and a programmable control voltage pedal. The ST-1176 also comes standard with four programmable zones, each with program change, channel assignment relative volume, transposition, and velocity scaling. The controller also offers aftertouch and MIDI merge options as well. The suggested retail price of the ST-1176 is $1395. For more details, contact Music Industries Corp., 99 Tulip Ave., Floral Park, NY 11001. Tel: 516-352-4110. Circle EQ free lit. #115.

World Radio History

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

168RC Digital Recording Console

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

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.***

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 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.

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World Radio History

CIRCLE 47 ON FREE INFO CARD

REALITY FOR $1500* A PAIR. INTRODUCING

If you've been trusting the quality of your creative product to passive monitors costing $400-$600 a pair, there's an astonishing revelation waiting for you at your Mackie dealer. In our opinion, the active, biamplified HR824 is the most accurate near-field monitor available. So accurate that it essentially has no "sound" of its own. Rather, the Mackie Designs High Resolution HR824 is the first small monitor with power response so flat that it can serve as a completely neutral conductor for whatever signal you send it.

HR HIGH RESOLUTION SERIES™

You'll hear the precise attack, texture and quality of individual bass notes exactly as they're being recorded. On instrumental and vocal tracks, you'll discern details of pitch, timbre and harmonics that passive monitors simply don't resolve.

Mackie acoustic engineer David Bie uses scanning laser vibrometry to map HR824 tweeter dome vibrations. Film at 11.

SCIENCE NOT SNAKE OIL.

Internally-biamplified, servo-controlled speakers aren't a new concept. But to keep the cost of such monitors reasonable, it's taken advances in measurement instrumentation, transducers, and electronics technology. In developing the High Resolution Monitor Series, Mackie Designs sought out the most talented acoustic engineers (being able to live in perpetual drizzle was a plus) and then made an enormous commitment to exotic technology such as scanning laser Doppler vibrometry, analyzers, time delay spectrometers and machines that go "*ping*." The High Resolution Series HR824 is the result of painstaking research and money-is-no-object components. Not to mention thousands of hours of listening tests and *tens* of thousands of dollars in tooling.

HR824 Active Monitors accept balanced or unbalanced ¼" and XLR inputs. Jacks & removeable IEC power cord face downward so that the speaker can be placed close to rear wall surfaces.

FLAT RESPONSE...ON OR OFF-AXIS.

One of the first things you notice about the HR824 is the gigantic "sweet spot." The detailed sound field stays with you as you move back and forth across the console — and extends far enough behind you that musicians, producers and your mom can hear the same accurate playback.

The reason is our proprietary exponential high frequency wave guide. Without it, a monitor speaker tends to project critical high frequencies in a narrow beam (Fig. A) — while creating undesirable edge diffraction as sound waves interact with the edges of the speaker. Imaging and definition are compromised. The "sweet spot" gets very small.

Like biamped speakers, wave guides aren't a new concept. But it takes optimized, internal electronics and a systems approach to make them work in near-field applications.

The HR824's wave guide (Fig. B) maximizes dispersion, time aligns the acoustic center of the HF transducer to the LF transducer's center, and avoids enclosure diffraction (notice that the face of the speaker is perfectly smooth.) The exponential guide also increases low treble sensitivity, enabling the HF transducer to handle more power and produce flat response at high SPLs.

CLEAN, ARTICULATED BASS.

When seasoned recording engineers heard the HR824 at a recent tradeshow, they couldn't believe the controlled low bass extension — several snooped around for a hidden subwoofer. They heard low frequency accuracy that simply can't be achieved with passive speakers using external amplifiers. There are many reasons.

The Mackie HR824 Active Monitor. ±1.5dB from 42 to 20kHz.

First, the HR824's FR Series 150-watt bass amplifier is directly coupled in a servo loop to the 8.75-inch mineral-filled polypropylene low frequency transducer.

It constantly monitors the LF unit's motional parameters and applies appropriate control and damping. An oversized magnet structure and extra-long voice coil lets the woofer achieve over 16 millimeters of cone excursion. Bass notes start and stop instantly, without overhang, distortion or "tubbiness."

Second, instead of relying on ports or slots, the HR824's low frequency driver is coupled to a pair of aluminum mass-loaded, acoustic-insulated 6.5-inch passive drivers. While typical, undersized ports cause vent noise, power compression and low frequency distortion, our ultra-rigid drivers eliminate these problems and couple much more

World Radio History

THE HR824 ACTIVE MONITOR.

effectively with the control room's air mass. They achieve the equivalent radiating area of a 12-inch woofer cone, allowing the HR824 to deliver FLAT response to 42Hz with a 38Hz, 3dB-down point.

Third, the woofer enclosure is air-displaced with high-density adiabatic foam. It damps internal midrange reflections so they can't bleed back through the LF transducer cone and reach your ears.

The typical problem of small-monitor midrange "boxiness" is eliminated.

The High Resolution transitional wave guide. Film at 11 unavailable.

precisely match each transducer's actual output via electronic adjustments. During final assembly, each HR824 is carefully *hand-trimmed* to ±1.5dB, 42Hz-20kHz. As proof, each monitor comes certified with its own serialized, guaranteed frequency response printout.

The HR824's front board is 1-inch thick with "radiused" edges to further eliminate diffraction. An "H" brace bisects the enclosure for extra rigidity.

Mackie is one of the few active monitor manufacturers that also has experience building stand-alone professional power amps. Our HR824 employs two smaller versions of our FR Series M•1200 power amplifier — 100 watts (with 150W bursts) for high frequencies, and 150 watts (200W peak output) for low frequencies. Both amps make use of high-speed, latch-proof Fast Recovery design using extremely low negative feedback.

Fig. C: Uneven fabric dome tweeter motion distorts high frequencies.

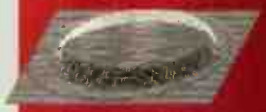


Fig. D: HR824 alloy dome's uniform, accurate pistonic motion.

Below: The HR824 Development Team. L to R, clockwise: Terry Wetherbee, Cal Perkins, Greg Mackie, David Bie, Paul Brengle, Jeff Hammerstrom, Dan Bonilla and Mats Jarlstrom holding P.D., our Over-20kHz Specialist.

A TRUE PISTONIC HIGH-FREQUENCY RADIATOR.

We scoured the earth for the finest high frequency transducers and then subjected the likely candidates to rigorous evaluation. One test, *scanning laser vibrometry*, gives a true picture of surface vibration patterns. Two test results are shown in the upper right hand corner of this ad. Figure C is a conventional fabric dome tweeter in motion. You needn't be an acoustic engineer to see that the dome is NOT behaving as a true piston.

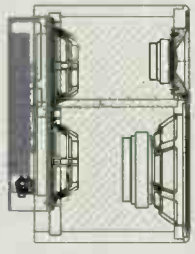


Figure D shows our High Resolution metal alloy dome at the same frequency. It acts as a rigid piston up to 22kHz, delivering pristine, uncolored treble output that reproduces *exactly* what you're recording.

INDIVIDUALLY OPTIMIZED.

You won't hear it from other manufacturers, but individual low and high frequency drivers can vary more than 10% in sensitivity due to production variations. Because our monitor is active, we can

HR HIGH RESOLUTION SERIES™
FR FAST RECOVERY SERIES™

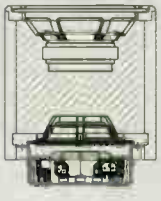
TAILOR THEM TO YOUR SPACE.

Because control rooms come in all shapes, sizes and cubic volumes, each HR824 has a three-position Low Frequency Acoustic Space control. It maintains flat bass response whether you place your monitors away from walls (*whole space*), against the wall (*half space*) or in corners (*quarter space*). A low frequency Roll-Off switch at 80Hz lets you emulate small home stereo speakers or popular small studio monitors.

CONFRONT REALITY AT YOUR MACKIE DESIGNS DEALER.

We've made some pretty audacious claims in this ad. But hearing is believing. So bring your favorite demo material and put our High Resolution Series monitors through their paces.

If you've never experienced an active monitor before, you're going to love the unflinching accuracy of Mackie Designs' HR824s.



If you've priced other 2-way active monitors, you're going to love the HR824's $1498/pair price* AND its accuracy.

*$1498 suggested U.S. retail price per pair.

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CIRCLE 42 ON FREE INFO CARD

World Radio History

Westwood's One

Rich Tozzoli gets the job done in this New Jersey-based project studio

STUDIO NAME: R. Austin Productions
LOCATION: Westwood, New Jersey
KEY CREW: Rich Tozzoli, owner/producer/composer; Dano, digital engineer/programmer/producer; Peter Vitalone, keyboardist/arranger
PROJECTS AND CREDITS: Rich has worked with Al DiMeola, Rite Of Strings (Al DiMeola, Stanley Clarke and Jean-Luc Ponty), Dion, 4PM, and The Dark Sun Riders. Dano has worked with Blues Traveler (all four albums), Butthole Surfers, Tony Toni Tone, and the Nevilles. Peter has worked with Donald Fagen and Lyle Mays. Together they have all composed and recorded music for Nickelodeon, British Airways, Fox 5, ESQ Watches, and *Reader's Digest*.
CONSOLE: Mackie 8•Bus 32-channel and CR1604; Yamaha ProMix 01
RECORDERS: TASCAM DA-88; Digital Expressions Soft Splice; Vestax HDR-6; Sony MiniDisc and DTC-D7
KEYBOARDS: Korg 01W; Kurzweil K-2000R; Novation Bass Station; Oberheim OB-8 and OB-3 Squared
SAMPLERS: Akai S1100; Kurzweil K-2000
MONITORS: Yamaha NS-10M; JBL 4408 and 4406; Bag End ELF/MM8 Time Aligned System
AMPLIFIERS: Yamaha P2100
GUITAR AMPS: Mesa Boogie Mark IV; Carvin Tweed
COMPUTERS & SOFTWARE: Macintosh Power Mac 9500 running MOTU Digital Performer, Passport Alchemy, and Digidesign Sound Tools
OUTBOARD GEAR: Demeter VTMP-2b; Lexicon PCM 80, LXP-15II, LXP-1, LXP-5, and MRC; Alesis D4 and QuadraVerb; Denon DN 961 and DN 650; Ibanez analog delay
MICROPHONES: Audio-Technica AT4033 and AT822 stereo mic; Sennheiser MD421; AKG C452's; Audix D- and SX-series; Shure SM57 and SM58
STUDIO NOTES: Rich Tozzoli comments: Dan, Pete, and I do independent projects and tours and work as a team producing bands and commercial scoring here in our room. Most of our studio is portable and we work very closely with the Club House in Germantown, NY — a vintage Neve room with a great selection of microphones. We can bring our tracks into the room, dump certain elements to tape, and leave other elements in the digital domain. We are heavily into sound design and we do a lot of crazy on-location DAT sampling with the Audio-Technica stereo mic, a parabolic dish, and the PCM 80. We love exotic and original sounds and strive hard to create that vibe in our productions.

World Radio History

Photo by Bill Hickey

EQUIPMENT NOTES: Tozzoli continues: Our system is integrated so that all components can run together, led by Digital Performer. The DA-88 will lock to hard disk and kick off the samplers, which allows us maximum flexibility and maximum tracks. The ProMix is usually used to automate the samplers and drum programs and is fed into the Mackie. We also have a Yamaha Pro Series Recording drum kit, fully outfitted with triggers that allow us the best of both the acoustic and sampled worlds. We like to use the Demeter mic pre for its fat tube sound, mainly on vocals, bass, and guitar tracks. Although our studio is digital, we are true believers that each medium — digital and analog — has its strong points. A creative mixture of the two leads to the best-sounding projects. **EQ**

World Radio History

Neumann KM-54a

MICROPHONE NAME: Neumann KM-54a
FROM THE COLLECTION OF: Jimmy Sloan, King Sound And Pictures
PRICE WHEN NEW: Approximately $300 (mid 1950s)
TYPE OF MIC: Tube Condenser
POLAR PATTERN: Cardioid
TUBE: AC701
FREQUENCY RESPONSE: 30 Hz to 20,000 Hz
SENSITIVITY: 1.2 millivolts/dyne/square centimeter
OUTPUT IMPEDANCE: 50 or 200 ohms (specified at ordering)
NON-LINEAR DISTORTION: Less than 0.4% (entire frequency range) to 110 dB absolute
EFFECTIVE OUTPUT LEVEL: –45 dBm minimum
FRONT TO BACK REJECTION: greater than 25 dB
POWER REQUIREMENTS: provided by Neumann NKM outboard power supply
DIMENSIONS: 7/8-inch (diameter) x 4 3/4-inches (length)
WEIGHT: 4 ounces
MIC NOTES: The KM54a holds quite an important place in the hierarchy of Neumann microphones. Introduced in 1954, the KM54a was a descendant of the omnidirectional M50 and was one of the earliest studio microphones with a half-inch capsule. Produced until approximately 1969, the KM54a was the grandfather of the Neumann KM64 and KM74 (one of the first solid-state, small-diaphragm condenser mics), and ultimately the popular KM84, KM140 and KM184. Available at the same time as the KM54a was the M154, an OEM version of the '54a designed for the broadcast market. The M154 featured an AC701k tube which was a select (low-noise) version of the AC701. The M154 often featured a different cosmetic finish or a radio station logo in place of the Neumann logo. While the original version of the KM54a utilized a nickel diaphragm in its capsule, this was changed to gold-plated mylar in 1964. This allowed safer operation by acting as an insulator between the plates and allowed for more consistent diaphragm manufacturing.
USER TIPS: Owner Jimmy Sloan likes to use this pair of KM54a's for recording Hammond organ. "I mic the rotor part of a Leslie with two KM54a's, one mic at a top corner and the other diagonally across the top part of cabinet for picking up the high speaker. Then down on the lower part of the Leslie, I'll use a third mic to pick up the low frequencies, like maybe a Neumann U47 or an AKG C12. Each mic comes into the console on a separate mic pre and then I group the three mics to stereo and record onto two tracks. I pan the low end mic center and the two KM54a's hard left and hard right. Then I run the stereo signal through a stereo compressor. Sometimes I'll use my Fairchild 670 limiter or a pair of Neve 32264a's, but in a pinch a dbx 166 or an Alesis 3630 will do just fine. Organ levels can change a lot due to the rotary speaker, so the compression helps to smooth it out and give it more of an 'old time' sound." EQ

Photo by Edward Colver

World Radio History

Open up.

World Radio History

And say ahhh...

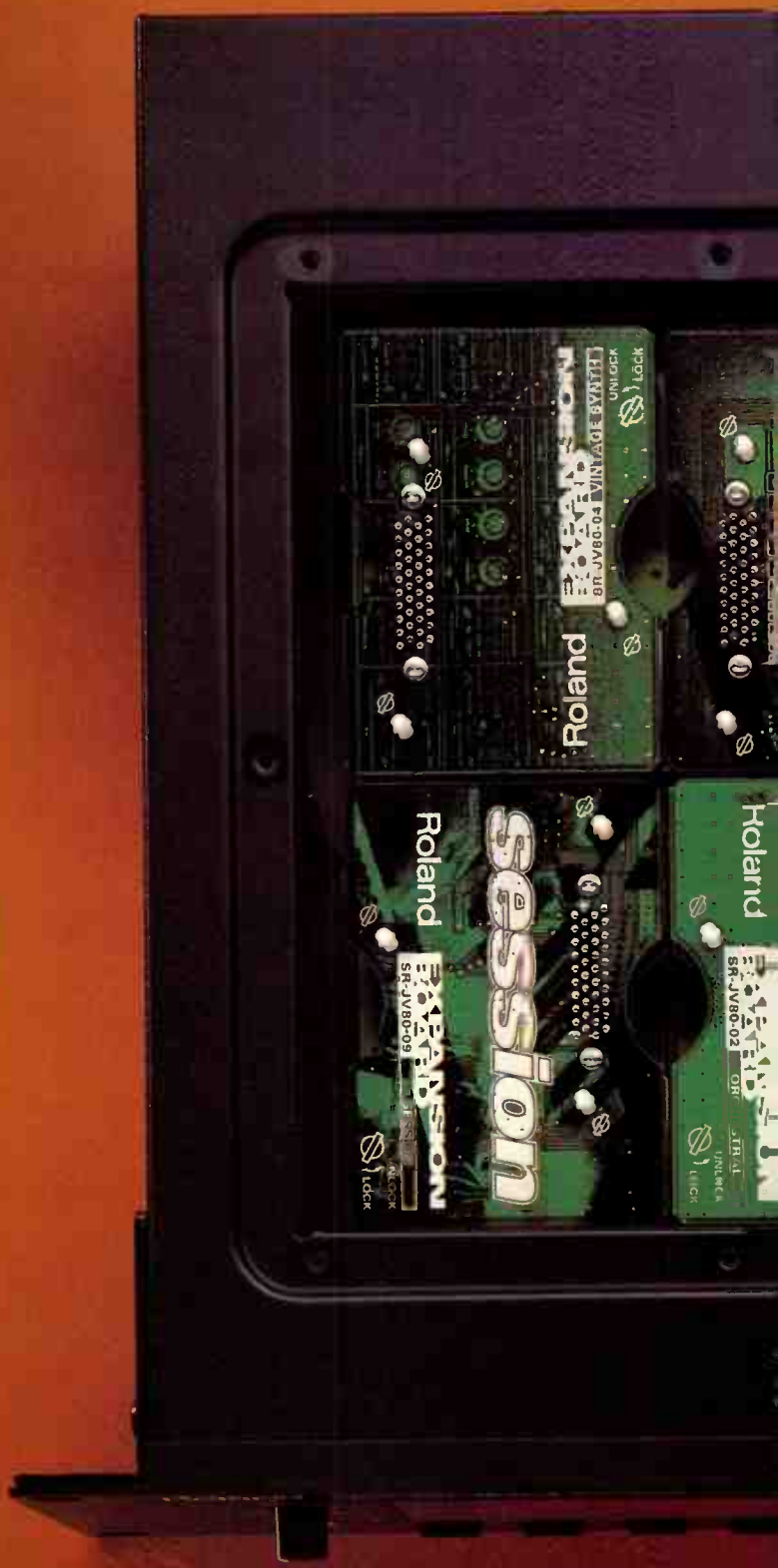
Then say hello to Roland's new JV-2080 Synthesizer Module. It's the latest evolution in the world's most popular line of sound modules.

With 8 expansion slots, the JV-2080 sets a new standard for user-expandability, giving you access to more than 2,900 patches when fully expanded. To help you take advantage of all these classic Roland sounds, we've added the Patch Finder so you can hear and audition only strings when you need strings, separate your basses from your brasses, and quickly locate any of your favorite internal or expansion patches.

The large LCD and Patch Finder make it easy to locate and audition any patch in seconds.

Once you've selected those perfect patches, the JV-2080's 64 voices, 3 simultaneous insert effects and 3 stereo outputs provide a flexible production environment that just may leave you speechless. So check out the JV-2080 at your local Roland dealer. And to audition the full line of Roland Expansion Boards, call (800) 386-7575 ext. 753 to get our Expansion Board demo CD ($5.00). Chances are, you won't stay silent long.

Use 3 insert effects simultaneously, each with 40 effects selections in addition to reverb and chorus.



Roland

JV-2080 Synthesizer Module

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Angela II

- Dual path architecture provides 80 inputs in the standard 40-channel chassis
- Extremely easy to use and especially suitable for project and production environments
- Comprehensive 4-band AMEK Eq on every input
- Fader and Mute automation on every input
- 8 Auxiliary and 24 output buses with Master level controls on all buses

- Proven AMEK SUPERTRUE automation with extensive on- and off-line mix operations
- 40 channels of AMEK VIRTUAL DYNAMICS provides a range of computer-controlled Compressors, Gates and other devices
- AMEK Visual FX provides remote operation via MIDI from the console of effects devices by major manufacturers such as LEXICON, TC and YAMAHA*
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CIRCLE 05 ON FREE INFO CARD
World Radio History

Alesis Studio 12R

Alesis packs plenty of punch into this versatile mini mixer

BY STEVE LA CERRA

There aren't a whole lot of small mixers that can be racked into only three spaces, and if you're looking for one that really has a clean signal path, the options diminish considerably. Alesis has addressed that need with their new Studio 12R — a compact mixer that actually has linear faders, hybrid/discrete mic pres and some truly useful features that will make it at home on the stage, in an instrument rack, or in a studio.

As you might have guessed from the name, the Studio 12R has a total of twelve input channels. Each channel has front-panel controls for mic/line trim, high-frequency EQ (±15 dB @ 12 kHz), low-frequency EQ (±15 dB @ 80 Hz), prefader and postfader send level, panpot, a 60mm linear fader with true logarithmic taper and a red LED for peak signal indication. Channels one through eight are mono mic or line channels while channels 9/10 and 11/12 are paired up in stereo for line level use only. Instead of having a pan control, these stereo channels have a balance pot.

Clearly intending the Studio 12R to be at home in a variety of sonic situations, Alesis didn't skimp when it came to the input connectors. There are ultra-low-noise, high-headroom, balanced XLR mic inputs as well as balanced 1/4-inch TRS inputs on channels one through eight; the stereo channels accept balanced input on 1/4-inch TRS as well (Alesis has thoughtfully screened the pinout for both XLR and TRS connections on the rear panel — where you need it). Plugging a signal into the "left" input jack only of a stereo input will route that signal to both sides of the channel. Inserts are available for channels one through eight on 1/4-inch TRS connectors (Tip = send, Ring = return).

By plugging a 1/4-inch connector half way into the insert jack, the insert becomes a direct output. Owners of ADAT machines will love this because they'll be able to use the 12R as a front end for recording live-to-ADAT via direct output. Also found on the rear panel is a single switch that turns on 48 V DC phantom power for the eight XLR mic inputs, and an adjacent switch to power up the unit. No wall wart power supplies here — Alesis provides a built-in supply with a detachable IEC cable for AC. In addition to the previously mentioned input connectors, you'll also find a stereo auxiliary return, two auxiliary send outputs (one pre- and one post-fader), and a monitor output, all of which are balanced on 1/4-inch TRS connectors. Rounding out the connector complement on the back panel are two pairs of unbalanced (–10 dBV) RCA jacks for tape in and main out — these will make your cassette deck quite happy for recording and playback purposes.

The Studio 12R's master section packs a lot for such a small mixer. Master output level is controlled by a single 60 mm, logarithmic fader, and there's an associated three-color, 10-segment LED display for the master output. There are also two LEDs to indicate when the power is on and when phantom power has been switched on. Gain of the stereo auxiliary return is variable from –∞ to +15 dB via a stereo rotary fader. If you are using an effect unit with a mono output, simply plug it into the left return jack and the Studio 12R will automatically route the signal to the left and right inputs of the stereo aux return.

Since the Studio 12R offers separate master outputs and monitor outputs, it is possible to simultaneously route a mix to (for example) a DAT deck and a pair of monitor speakers, while maintaining a separate gain structure for each. The L/R mix output level would be controlled by the straight (master) fader while the monitor output would be controlled by the front panel "phones/monitor" pot (this pot also controls level going to the headphone jack). A switch directly below the monitor pot routes either the two track tape return or the L/R master mix to the monitor and 'phones jacks, allowing you to instantly switch to tape playback.

The Alesis Studio 12R will begin shipping in February 1997 at a suggested list price of $449.

For more information, contact Alesis at 3630 Holdrege Ave., Los Angeles, CA 90016. Tel: 800-5-ALESIS. Circle EQ free lit. #120.

World Radio History

Whirlwind AC2 Mic Splitter

Whirlwind enhances mic performance with an innovative new splitter

BY STEVE LA CERRA

Whirlwind's Active Concert Series is a new line of 1 x 4 mic splitters with a twist: instead of just offering the typical passive three-way split, these units utilize active microphone inputs to drive multiple outputs. By using an active input, Active Concert Series splitters (available in 32- and 48-channel versions, all with eight returns) can eliminate the loading effects often encountered when using passive splitters. Input impedance is 10 kohms as compared to the typical console input impedance of 1 kohms to 2 kohms, preventing any splitter-induced loading of the mic inputs at your house console. This results in better performance from your dynamic mics.

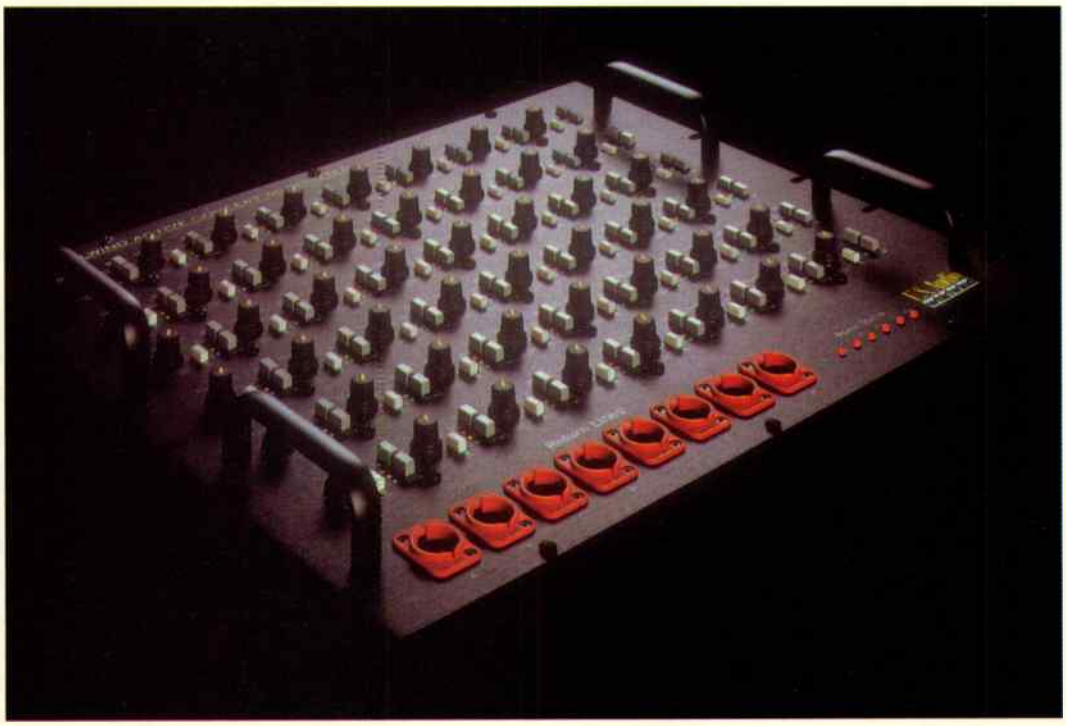
Each microphone input feeds a passive, parallel-wired direct output (intended for the front-of-house console), as well as the input to an Analog Devices 2017 mic preamp — which in turn drives the remaining three outputs. Your house console will receive mic signals and send phantom power to condenser mics via the parallel-wired output regardless of whether AC is applied to the splitter or not (more about that later), ensuring that you don't have a disaster at the FOH position.

On the front panel of these units is a series of controls for each channel: a three-LED headroom display, a 10 dB gain switch, a rotary-pot gain control, and ground-lift switches for the two fixed-gain outputs. By doing a resistor change on the PC board, the amount of gain selected by the High and Low positions of the Gain switch can be modified to different values. While the fixed-gain outputs are most likely to be used for send to the monitor console(s), the variable-gain feeds can be used to drive the input of a tape machine (for direct recording) or for line-level feeds.

Of the remaining three outputs, two are fixed-gain and one is variable-gain. All of these can either be transformer-isolated or active (your choice): Whirlwind recommends transformer output for runs longer than about 50 feet because transformers can maintain a high common mode rejection ratio (for shorter distances, transformerless output would provide the lowest possible THD at low frequencies). For ultra-critical applications, the fixed-gain active outputs (instead of the direct outputs) can be used to feed the front-of-house console.

Whirlwind certainly didn't punk out when it came to the power supply for the Active Concert Series. A two-rack space outboard module is used to power the splitter. Inside the module is actually two independent power supplies, and these actually have separate AC line cords that could be routed to different AC circuits for ultimate redundancy. In the event that one of the power supplies fails, a 20-amp relay switches over to the other power supply. Power is regulated locally for every pair of channels in the system and each eight-channel circuit board is separately fused with a status LED on the front panel.

Standard versions of ACS splitters are equipped with rear-panel XLR connectors for the microphone inputs, MASS multipin connectors for each spiltter output, and front-panel XLR connectors for the balanced returns. Three dB down points are 3 Hz and 100 kHz, while frequency response is stated to be within 0.7 dB from 20 Hz to 20 kHz. Residual noise is rated at –110 dBu with unity gain. The Active Concert Series splitters are shipping now; prices depend on configuration and options.



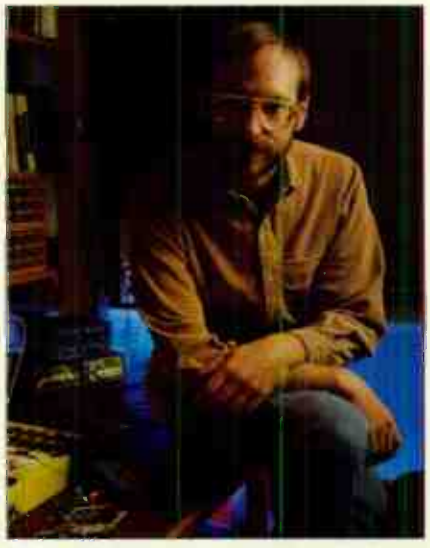
For more information, contact Whirlwind at 99 Ling Road, Rochester, NY 14612. Tel: 716-663-8820. Circle EQ free lit. #121.

World Radio History

News From MIDI-Land

With changing copyright views and Internet possibilities, it's an exciting time to be a MIDI-lover

BY CRAIG ANDERTON



MIDI has become such a part of musical life that we tend to take it for granted. But behind the scenes, the MIDI Manufacturers Association (MMA), an industry group of over 140 hardware and software manufacturers, is constantly working to update and promote the spec. The process of change can sometimes be frustratingly slow, because of the need to make sure that any changes are universally applicable, technically sound, and compatible with the plans of the membership. Yet, recently, the MMA scored a major coup that could provide another possible revenue stream for the project studio: the legitimization of MIDI files (see sidebar) from a copyright standpoint.

MIDI JOINS THE REAL WORLD

For years, the MIDI files market has flourished in Europe and Japan; a single mail-order outlet can sell up to 10,000 disks a month. In Japan, "desktop music" sales hit $35 million in 1994, and the upward trend continues. Interestingly, 70 percent of this business involves first-time buyers, which implies the birth of an entirely new market. Products include the expected MIDI files of pop songs, but also "music construction kits" on floppies and CD-ROMs. These files are treated as mainstream consumer items, suitable for entertainment or education.

The growth of this market not only means that musicians are needed to program the files, but that many more people will get turned on to making music, thus growing the music industry. Already, some musicians and studios are making money from MIDI files, but so far that has been difficult in the USA because it was uncertain whether a MIDI file should be considered a sound recording, computer software, or something else. As a result, negotiating with publishing companies for the rights to produce MIDI files has been a long, arduous, and often very expensive process. Contrast this with a country like Germany, where licensing mechanisms are in place that make it easy for those producing MIDI files to obtain licensing rights and pay a royalty.

Finally, though, it looks like the USA is going to catch up, thanks mostly to the MMA contacting the U.S. Copyright Office to see if they had any opinion about how to treat MIDI files. After some discussion, the USCO delivered an opinion that MIDI files should be copyrightable because they meet the legal definition of a "sound recording," and that MIDI files, if unaccompanied by visual images, are "phonorecords" and subject to a standard mechanical or compulsory license. In other words, as with audio recordings, if you want to create a MIDI file version you simply go ahead and pay 6.9 cents per copy sold to the song's publisher — much less than the 25 cents to $1 figure often negotiated up until now for the rights to create a MIDI file.

Furthermore, the MIDI file itself is given some protection under the law so that MIDI file composers will be rewarded for their efforts. (This is similar to standard music business procedure; if you do a cover version of a tune, although you pay a songwriter's royalty, you also receive a royalty for your version.)

The Copyright Office's opinion is not law, but it's likely to be cited should cases come to court challenging the right of someone to make a MIDI file. Of course, some music industry types think this opinion is a bad thing because the price per song is generally less than the current "what the traffic will bear" royalty. However, to put up roadblocks against this opinion would be shortsighted. Would you rather receive $1 for

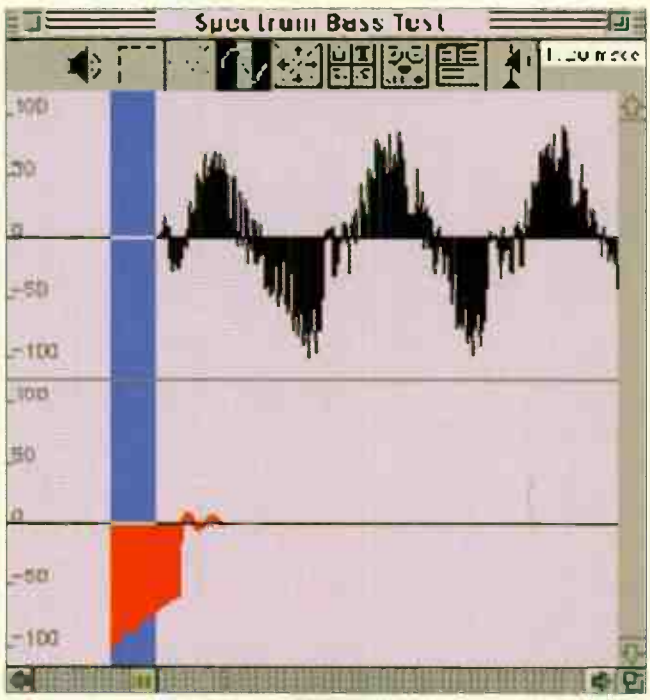


FIGURE 1

World Radio History

2 MILLION THREE HUNDRED FIFTY THOUSAND TRACKS LATER OTARI REMAINS THE LEADER IN PROFESSIONAL TAPE BASED RECORDING

Introducing the newest in this lineage, the DTR-8S PRO-DAT Machine. With features and specifications that could only come from a company that's been there, again and again.

Audition a DTR-8S today and compare our sonics to the best that's out there, then compare the price. With the DTR-8S, we're certain you'll find you're on the right track.

DTR-8S

- High Quality A/D and D/A Converters
- 48 kHz, 44.1 kHz and 32 kHz Sampling Rates
- Input Monitoring of Digital and Analog Inputs
- Active Balanced Input and Outputs on XLRs
- AES/EBU and S/PDIF Digital I/O
- 300 Times Play Speed Search to TOC Marks on Tape
- Alphanumeric Program Naming for Easy Locate
- Supplied with Wireless Remote and Rack-Mount Kit
- No SCMS

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World Radio History

CIRCLE 55 ON FREE INFO CARD

MIDI FILES

MIDI files contain data about a composition rather than the actual sounds themselves. The sounds are produced by MIDI-compatible "tone modules," which produce notes in response to incoming MIDI commands. These tone modules can be stand-alone boxes, sound cards, keyboard synthesizers, etc.

Because MIDI data doesn't contain information about the sound itself (e.g., there is no built-in way of knowing whether the data is intended for flutes or tympanis), the MMA adopted the General MIDI specification, which correlates specific instrument sounds to specific program numbers. If the program number is sent as a "header" at the beginning of a track, then the tone generator plays back the appropriate sound for that track. Programs can also be changed within a track.

Compared to digital audio, MIDI files save memory and are easily modified. They are used in computer games to trigger on-board sound generators, as a way to move musical ideas over the Internet in a memory-efficient way, to provide instrumental backing, and for educational and recreational purposes.

—Craig Anderton

each of 100 copies sold, or 6.9 cents for each of 10,000 copies sold? I think I know the answer.

The story isn't over yet; there are still issues that revolve around creative control affected by compulsory licensing, as well as the same issues about electronic distribution (Internet, pay-per-listen, etc.) that plague other audio formats. Lyrics in a file are still another story, as is the right to print sheet music. But now there's a foot in the door, and it's recognized by the Copyright Office. Hopefully, the remaining kinks will be worked out and before too long, the USA will have a vital — and profitable — MIDI file market.

DOWNLOADABLE SOUNDS

The MMA's next goal is establishing a specification for downloadable sounds so that MIDI compositions will not be limited to the fixed General MIDI sound set (see sidebar). The Downloadable Sounds Spec (DLS) provides a way to augment General MIDI with custom sounds by downloading a new bank of samples. For example, if you want the sound of dozens of lawyers being eaten by dinosaurs, you no longer have to cobble together some combination of General MIDI sounds to approximate that effect: simply designate your sample of dinosaurs eating lawyers as a downloadable sound, and, if a game requires it, the sample will be downloaded into the sound card.

Unlike General MIDI, DLS allows developers to know exactly how their music will sound because the actual sounds are delivered by the developer along with the music data, and all DLS

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cards must pass certification tests in order to be DLS compatible.

DLS is also seen as useful for Internet audio content delivery, as well as for any kind of interactive audio applications. In fact, David Sparks (president, Sequoia Development Group) thinks that downloadable sounds are "the portable platform that will change the face of interactive audio, in much the same way that the Web has changed the face of the Internet."

WHAT DOES ALL THIS MEAN?

Just as cable TV and DSS spawned a hunger for content that led to MTV, Nick at Night, the Learning Channel, and the option to see movies so bad they would have otherwise disappeared without a trace, downloadable sounds are going to create a demand for fresh, high-quality samples. Meanwhile, MIDI files will provide a new means to distribute music and, perhaps more importantly, create work for project studios and individual composers. Already, many game soundtracks are being farmed out to smaller studios, and this trend should increase.

Furthermore, the MMA definitely has a background agenda in all this: make it easier, and more fun, for people to get into music. (Coming soon: Standard MIDI File extensions to better support exchange of lyrics, linked digital audio tracks, multiple MIDI ports, and interactivity controls; 3D audio controls are also expected soon.) After all, the MMA consists of companies whose livelihoods depend on people wanting to make music and buying the products necessary to do so. Already, there's a trend in Europe where those who were raised on loading samples into computers and doing remixes now want to take up instruments and become more proficient at what they do. If that happens here, a more musical culture should benefit all musicians — and hopefully provide new ways to keep the project studio financially afloat.

For more information on MMA-related developments, as well as info on how to obtain a copy of the official MIDI spec as well as some additional GM implementation guidelines for developers, point your web browser to http://home.earthlink.net/~mma.

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CIRCLE 06 ON FREE INFO CARD

World Radio History

Why Give A Damn About NAMM?

Photo by Jim Herrington

A veteran's guide to the sights — and sounds — of the noted music show

BY AL KOOPER

I remember my first NAMM show. I was like a kid in a candy store. I couldn't believe something like this existed — and you didn't have to take your clothes off or pay to get in! For those who have never been, the NAMM show is where manufacturers of all things musical unveil their upcoming product lines to distributors, buyers, mom and pop music shops, the press, musicians, producers, and engineers. Winter NAMM, which is the larger of the two, usually takes place at California's Anaheim Convention Center the second week in January. I attended for 20 years in a row (I was gonna say straight, but I can't vouch for those early shows!). In 1994, I arrived a few days early and was treated to that marvelous 4:30 AM *earthquake* that threatened my life and soiled my undergarments. I have not attended NAMM or the state of California since then. Conveniently, there is a Summer NAMM, albeit on a smaller scale, in Nashville each year — so no earthquakes, plane fares, or hotel bills for Al!!!!!

Many manufacturers of equipment set up booths of varying sizes and scopes so that the promised equipment may be actually tried out right then and there. Sometimes effects boxes or keyboards or their ilk are placed in glass cases. This is a sure sign that the equipment is probably what they call "vaporware" — promised goods that didn't get their guts done in time for the show, but have pretty enough faces to at least smile at you from behind the scrutiny-free safety of the glass. They should all be put in "People With Glass Cases Shouldn't Show" zones!

Companies with a flair for psychology hire scantily clad centerfolds to hawk their wares. This practice peaked in the early '80s when Kramer Guitars would field a bevy a beauties that outnumbered the guitars they were previewing. I often wondered why some enterprising photographer never chronicled all this and put out a "Girls of NAMM" calendar. It's actually still not too late! Nowadays, these women are still in attendance, but the trend seems to be toward having famous musicians perform hourly in the booths. It's a chance to meet your favorite musician, hear him/her play in a cramped, inappropriate, unventilated space, get his/her autograph or his/her photo taken with you, and wonder just what sort of blackmail is being levied to get this person to do this in the first place!

Let's talk about the *sound* of NAMM. Imagine a veritable symphony of terror (actually the name of my friend Evil Wilhelm's band) — hundreds of manufacturers of tubas, drums, electric guitars, basses, violins, banjos, synthesizers, et al, all blaring their progeny at the same time for eight straight hours?

It's an interesting sound.

One imagines Hell will feature this as background music for whatever Lucifer has in mind for us after (conventions in) this life. The more experienced attendees can actually drown this out and not even hear it until they step out in the relative silence of downtown Anaheim hours later and take in the calm.

The evenings are given over to corporate-sponsored concerts featuring many top acts you would *love* to see. Attendance is by invitation only and available by intimidation at the various sponsors booths. These concerts are crammed to way over-capacity and are usually not that enjoyable to attend unless you're actually performing or you enjoy being the recipient of projectile vomiting while you listen to live music. For those who are too *whatever* to brave the crowds, the bar at the Anaheim Hilton is the most hilarious nightly entertainment in town. At it's peak, George Lucas could just walk around with a videocam and have *Star Wars* bar footage until well past the millennium. The groupies — male and female — come to rub whatevers with the famous and famous looking. You know the drill.

For four days and nights this bacchanal goes on. Many orders are taken and much business is consummated on the convention floor. Many musicians/producers/engineers view the four-day event as a live video game. Object? Score as many endorsements in four days as possible and reap the free merchandise points in the spring. You see their contented faces staring out from myriad adverts in informative journals such as this one currently in your hands. The champs are the ones whose mugs appear in as many different companies ads as possible. Their "fame" precedes them.

This show and its attendant soirees are *not* open to the public. If you can figure out a way to crash just one day out of the four, I promise you a rush not unlike that of Original Sin if it's your first time. For those of us who are veterans, I commiserate and wish you the proper hangover cures and foot baths. Have a great time, my brave ones. I'll be seeing you at Summer NAMM. EQ

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02R Praise From Recording Pros.

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Grammy award-winning producer of Billy Joel, Frank Sinatra, Barbra Streisand and others.

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Frank Filipetti:
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"I really like the A/D converters on the 02R. They sound very musical, and not at all harsh. I give very high marks to the EQ; it gave me everything I needed for tracking."

Hans Zimmer/Media Ventures:
Oscar winning film composer; The Lion King and Rain Man and others.

"We've put 02Rs into every room at Media Ventures. It's become the essential piece of audio gear for all of us. There are now no less than 16 02Rs scattered among the facility which are being used on such projects as Chicago Hope (CBS) and The Profiler (NBC)."

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CIRCLE 93 ON FREE INFO CARD

World Radio History

"Weird" Al Yankovic

Photo by Ed Freeman

Getting down with the king of song parodies

BY MR. BONZAI

BONZAI: Al, what is the first music that you remember hearing?
WEIRD AL: One of my earliest musical memories is a song called "Boa Constrictor" — sung by Johnny Cash and written by the brilliant Shel Silverstein. The recording ends with the boa constrictor belching — which to a five-year-old is, of course, the pinnacle of cerebral humor. The first pop song I remember hearing was "These Boots Were Made For Walkin'" by Nancy Sinatra. And even as a small child, I could play that guitar solo.

What great truth did you learn from your grandfather, Blind Lemon Yankovic?
Grandpa Blind always told me, "Son, remember...you can pick your friends, and you can lead a horse to water, but you can't keep your eyes open while you're sneezing." And I never forgot that.

Who were your heroes when you were getting started?
The artists that influenced me the most were Spike Jones, Allan Sherman, Stan Freberg, Tom Lehrer — people that I came to appreciate through my weekly exposure to the Dr. Demento radio show.

Is there anyone in the world that you would like to meet?
The guy that stole my last car. I want my tapes back!

How would you like to be remembered in the Encyclopedia Brittanica?
Well, I think I'd like to be remembered as the all-powerful master and ruler of the universe.

What equipment and software do you use at home?
In the last couple of years I've been using Passport software like MasterTracks Pro 6.0 (for sequencing) and Encore (for notation). And I've got a very nice Kurzweil K2000S keyboard...but I still find myself drawn to the $30 Jaymar piano I bought 15 years ago at Toys R Us. I figure if a song sounds good on *that*, it'll sound good on anything!

Which studio do you use for your albums?
I've been recording since, oh, about 1983 at Santa Monica Sound Recorders. It's the in-house studio of Scotti Brothers, which is the label I'm signed to, so I've been either contractually obligated or at least strongly encouraged to record there. And although I haven't had much to compare them to, I must say I'm very satisfied with the results — we've been able to emulate everyone from Nirvana to Billy Ray Cyrus. I'm just glad the mixing is automated now — it's hard to believe that just a couple years ago, we'd have four or five people on the board, turning knobs and moving faders, hoping they didn't miss their cue.

Do you have a favorite engineer?
Again, I was paired up with Scotti Brothers' in-house engineer Tony Papa

SUSPECT: "Weird" Al Yankovic

OCCUPATION: Accordion player; music video director; disguise artist

MOST RECENT ALBUM: *Bad Hair Day*

MEMORABLE SONGS: "Amish Paradise," "Like A Surgeon," "Eat It"

RESIDENCE: Hollywood, CA

DIET: Favors peanut butter and broccoli sandwiches

VEHICLE: '92 Madza Miata (but is coveting a '58 Metropolitan)

PECULIAR HABITS: Jumps around with one leg behind his head; yodels when provoked

"Weird" Al photos by Mr. Bonzai

World Radio History

How to buy your next reverb without listening to it.

The first criteria in choosing a reverb is always sound quality. Everyone claims they sound the best but ONLY the Yamaha REV500 has 32-bit internal processing and 20 bit A/D and D/A conversion. Everyone else has 24-bit or less processing and 16 or 18-bit conversion.

The difference between 32-bit and 24-bit is audible: 32-bit processing gives you significantly smoother decay so your reverb fades imperceptibly into "silence." The difference between 20-bit and 16/18-bit conversion is also dramatic. 20-bit A/D D/A means the REV500 is exceptionally quiet, eliminating noise in recordings and adding headroom in live applications.

Stereo professional +4dB/-10dB balanced inputs and outputs.

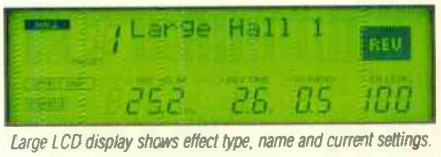
The second criteria is the actual effects—what are they and how do they sound? The REV500 includes 100 top quality halls, rooms, plates and special reverbs. These simulations of actual environments place your signal in "real" locations for unparalleled realism. And the REV500 also gives you 100 spaces to store your own settings.

The third criteria is the ease of accessing the effects. REV500 true stereo halls, rooms, plates and special reverbs are instantly recalled from the front panel. The REV500 has front panel controls for reverb time, pre-delay, high-frequency decay and early reflection level. If you want to change these settings, just turn that control and the LCD instantly shows a picture of what's happening. You can **see** what you're hearing.

If you want to hear it, too, only Yamaha has built-in drum samples so you can hear the effects without an external sound source. Just hit the "audition" button as you select and customize your effect.

The fourth criteria is price. Once again, the REV500 delivers like no one else: $499 for a professional reverb. But if you'd rather pay more, you can buy the $1299 Yamaha **ProR3** which has the same 32-bit engine and 20-bit A/D D/A with a keypad for calling up effects, two types of EQ and a gate which can be placed around any reverb.

Now that you know enough to buy the REV500 sight unseen, we recommend you go listen to it. The sound quality will blow you away. Call (800) 937-7171 ext. 680 to find the Yamaha REV500 dealer nearest you.



Large LCD display shows effect type, name and current settings.

Turn the reverb time control, see the reverb time displayed graphically

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at the very beginning and I've been with him ever since. I couldn't have been luckier. Tony is a real jewel. His well-trained ears have been one big reason why my parodies over the years have managed to remain so faithful to the originals. Plus, he's incredibly patient and just an all-around cool guy.

How do you emulate the exact sound of the records you parody?
The secret to producing parodies is working with people that know what they're doing. As I've said, my recording engineer is as good as they get, and my band is extremely accomplished and versatile. They all pay incredible attention to detail, so I never really have to crack the whip on them. Oftentimes, all I really need to do is to pass out CD singles to the band and say, "Here...learn this!" Depending on the song, sometimes we have to track down an obscure make of guitar or rent an archaic piece of gear or utilize a prehistoric baffling technique. We try to be as authentic as possible.

What was your most thrilling experience in a recording studio?
I was called in to do some session work on a Brian Wilson album a few years ago. Brian was producing, Van Dyke Parks was hanging out (along with Dr. Landy, who was still handling Brian at the time), and there I was, playing the accordion! I don't think that album was ever released — at least the cut I worked on wasn't. All I remember is that the song was in waltz time, and Brian just had me doing the most ridiculously simple oom-pah-pah part. I kind of wanted to show off my chops to him, but I guess it wouldn't have been appropriate in the context of the piece.

What was your most frightening experience onstage?
Generally my most frightening experiences onstage revolve around me forgetting the words to songs. It's not a very

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CIRCLE 14 ON FREE INFO CARD

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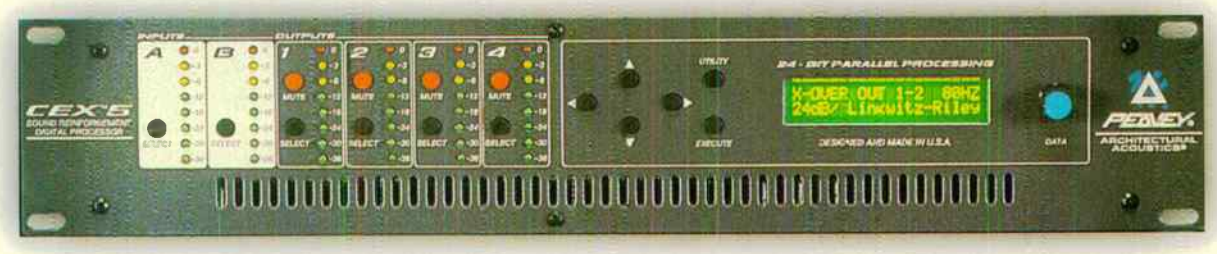

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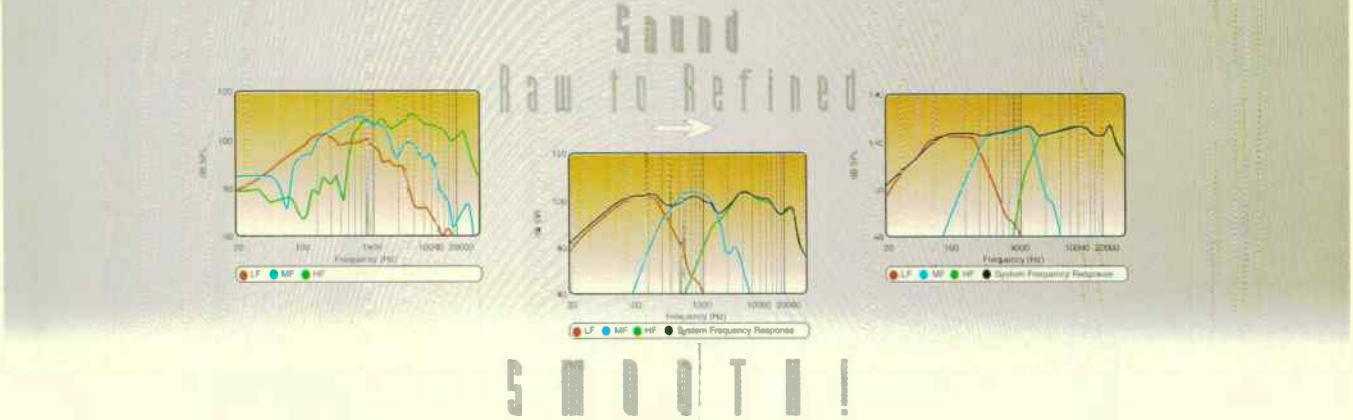

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CIRCLE 57 ON FREE INFO CARD

common occurrence, but it has been known to happen — sometimes in the middle of songs that I've performed hundreds of times. Usually when I forget the lyrics, I just pretend to mouth the words for a few seconds, then I tap the microphone a couple times and glare angrily at the sound engineer.

Do you know any interesting business tricks?
Here's a good one: Identify your competition and systematically crush them.

Who do you think you were in past lives?
Well, I can't be sure, but I think for a while I was a janitor named Bob.

What music would you like played at your funeral?
I would like the '70s classic "Convoy" to be played over and over during the entire service.

Is there any old proverb that just makes you feel kinda sick?
Oh yeah, here's one: Life is like a bowl of festering meat crawling with maggots.

Who is the most amazing musician that you've worked with?
Gee, it's hard to pick...Jim West, Steve Jay, Jon "Bermuda" Schwartz...all the guys in my band are great!

What is your strongest characteristic as a human being?
I would have to say my opposable thumbs.

What's the biggest mistake of your life?
Turning down the role of Indiana Jones. Oh, and getting that tattoo of John Tesh on my butt.

Do you ever think, in some weird way, that parody can make the original song more interesting?
Well, that's what I always tell the original artists!

Would you rather be a Red Hot Chili Pepper or a Bare Naked Lady?
Well, I guess a Chili Pepper, because, if I do say so myself, I look pretty darn good in a tube sock.

How do you use computers in your daily life?
I mostly use my computer for word processing, money management, phone number databases, musical notation, and various mind-numbing games. Unfortunately, the computer I currently own is a couple months old, so of course, it's hopelessly obsolete.

Do you have any advice for getting a good start in the music business?
Kids, just practice, practice, practice. I don't want any of you having to sleep your way to the top like I did!

About the author: Roving journalist and photographer Mr. Bonzai first met "Weird" Al ten years ago during the recording of "Yoda" and has never been the same since.

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CIRCLE 09 ON FREE INFO CARD

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World Radio History

Regarding **Henry**

A look into the recording of the new Rollins Band album with Henry Rollins, producer Steve Thompson, and engineer Clif Norrell

BY ROBERT GRANGER

Henry Rollins is a man who knows what he wants. When it came time for him and the Rollins Band to enter the studio to record their latest release (which was still untitled at press time) he wanted to find a producer who would help capture the overall power and feel of the band. Rollins found his man in veteran producer Steve Thompson.

In his 20-year career as a producer/mixer, Thompson has worked with such diverse acts as Soundgarden, Guns 'N' Roses, Madonna, Metallica, Lionel Richie, the Rolling Stones, and, most recently, Blues Traveler and the Butthole Surfers. Thompson brought engineer Clif Norrell (Faith No More, Rush, R.E.M.) into the equation, and the team, along with the band, have created what could possibly be *the* Rollins Band album. Henry, Steve, and Clif recently took some time at Sorcerer Sound in NYC, where they were in the process of completing the final vocal overdubs and mixes, to sit and discuss the project.

EQ: Why did you decide to go with Steve Thompson?
Henry Rollins: We talked to a lot of really great producers and probably any one of them would have done a good job with this record because the music is very sturdy. Obviously, with different producers you're going to get a whole different vision. Each guy is going to put across what he thinks is the right thing. So you really have to analyze the actual person. Of all the people that we spoke with, Steve's vibe struck me immediately. It seemed like he was a guy who really understood what we were trying to put across and he could really maximize the material. We played the set in front of him, and he listened to it, and the things he said about it made me say, "Wow, he really seems to know where we're coming from."

Did you have all the music and lyrics written before you entered the studio?
Rollins: I had almost all of the lyrics written. We had all the tunes, except for a few tracks that are real spontaneous that end-

Photos by Julian Jaime

STUDIO SORCERERS: From left to right: Steve Thompson, Henry Rollins, and Clif Norrell at Sorcerer Sound (NYC).

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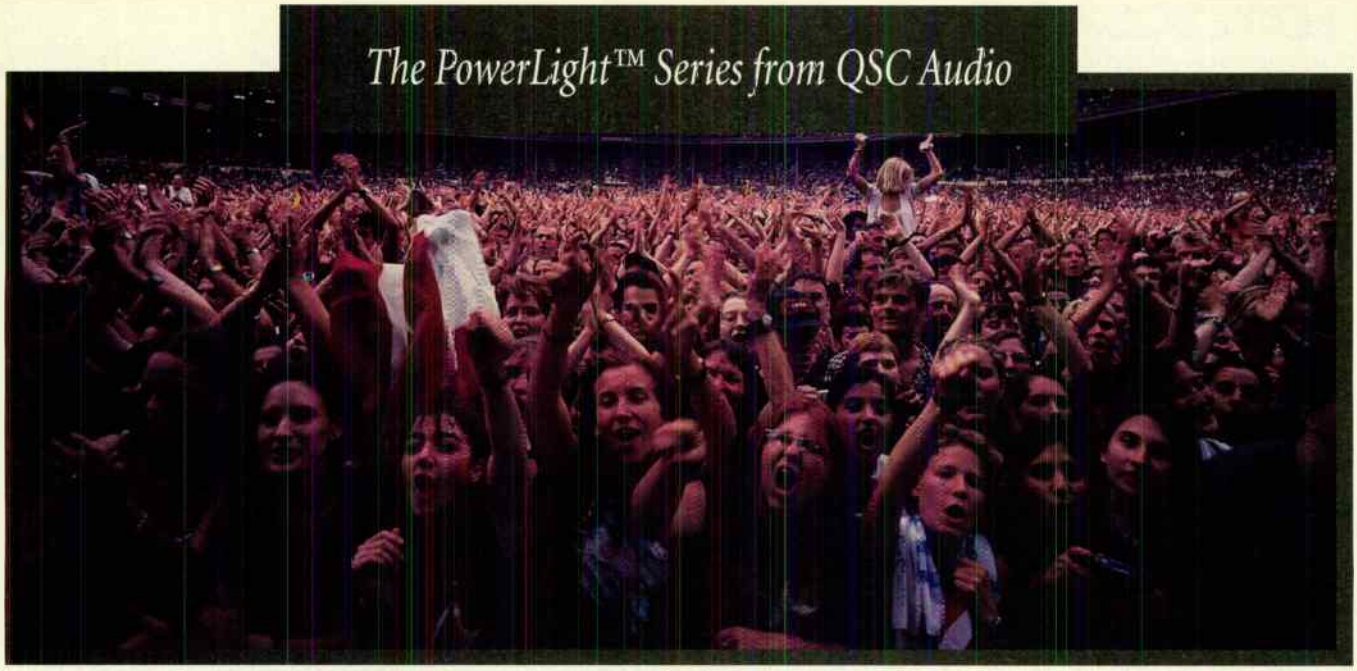

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CIRCLE 62 ON FREE INFO CARD

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ed up being very good. In fact, one of them is going on the record. In total, we went in with 18 written songs and we came out with 22 completed songs.

How did you handle preproduction?

Rollins: We had 16 tracks of ADAT set up and we recorded everything live. We would take one song a day and decide where it needed work and whip it into shape. We would play the song through, listen to it, and figure out exactly what the tune needed. We made up our minds that nothing was good enough and nothing was above thorough examination. Sometimes that meant taking a chorus out and inserting a whole new section, or just dumping whole parts. We did that for almost a solid month, five days a week and we walked out of there with the stuff we went into Bearsville [Studios] with. It was a very healthy environment because by 6 PM the day was done and we each had a real sense of accomplishment.

Steve Thompson: Basically the band had spent between a year and a year-and-a-half working on the material, and they got to a point where they were overworking the songs. That can happen very easily. So we put in about four or five weeks of preproduction and basically I had to deprogram them. They're all unbelievably great musicians — there's not a weak element in this band whatsoever — but sometimes you have to play less to be heard better. We worked on the arrangements a lot — we opened some of the verses and went for a more groove-oriented feel. We were trying to get the ultimate in dynamics. That's one of the major reasons why I wanted to work with Henry; he's so dynamic live, and I wanted to capture that on record.

How long did it take to feel each other out and finally gel?

Rollins: It took the guys in the band a few days to get used to the idea of someone from the outside coming in to critique us. We're very insular. Originally, we brought in a lot of producers and some had some good comments, but some absolutely alienated themselves from us within twenty minutes — one guy in particular. Bob Ezrin came by at one point and had a bunch of great ideas, but in the end his schedule was too busy to work with us. What's really cool about Bob is that he's actually come to some mixing and preproduction sessions to give us some input and support because he's a fan. He's just one of those super-cool guys who loves music.

Overall, it was really up to the guys in the band to surrender a little to an opinion and go with it. Within a few days, after everyone heard Steve's ideas and heard his rough mixes, I think everyone really started to get into it. The proof was in the pudding. When he said that he wanted to simplify the music and make it groove more, everyone was kind of looking at him funny because everybody really loves their 800-notes-a-minute. So when he asked them to simplify it, I asked them to do it for me. And we would do it, and it would have tons more impact. I think by tne weekend everyone was cool with Steve.

You really have to trust your producer to decide what is and what isn't good, and it's a heavy job because production makes or breaks a band's record. I've heard great albums with bad production and you have to stop and think about what that song could have been if the producer wasn't trying to be Brian Eno. Steve just brought his attitude and his vision to the project and let the music really happen. And I think that's the sense you get when you hear the tracks. I've never bragged

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OH HENRY: Rollins receives Thompson's and Norrell's bill.

about a record that I've ever done. With this record, if you don't like it, it's not our problem, you are f—-ed up. It's the only time I've ever done a record in 22 albums where I can honestly say that.

Thompson: Getting back to what Henry said about the different production styles, the one thing that I always want to make sure of as a producer is that I don't want to make a Steve Thompson record. I want to make a Rollins Band record — or any band's record for that matter. I'm not from the school of assembly line production, I hate that. I'll guide a band. I'll do whatever it takes to get the best performance out of them, but the bottom line is that the band has to do it themselves. If you have a producer coming from an engineering background, basically they'll find the perfect sound and apply that to every band they record.

I have to credit my engineering background to Michael Barbiero, the best teacher in the world. I learned so much from this guy since I first started working with him in 1979. He's one of those perfect engineers, so I made sure that we got so many different types of projects, from Lionel Richie to Metallica, so this way he couldn't apply any standard sounds and we'd have to change with each project.

Even though a lot of bands will hire you because of what you did on a particular album, you've got to try to top that. This way, a band can have their own identity. That to me is the most important thing in music. People who listen to music know when they're being f—-ed with and when they're hearing an honest approach to a band. And that's why it's very easy to polish something. The hardest job for a producer is to leave the right mistakes in. The one thing that I can say at the end of the day with this project is that it's a Rollins album, and I was just glad to be there and working on it.

How did Clif join the project?

Thompson: Right now I've been afforded the opportunity to work with a lot of different engineers, so I could put my energies somewhere else. My manager Andy also manages Clif and told me to check him out. I'm always willing to work with new people, so we tried it out on a project that I was working on with Sussana Hoffs and Matthew Sweet, and Clif was perfect. We went through the sounds that I was looking for and he came right to the plate — blew me right out the door. He's so adaptable to anything that we'd want to do. He's also really adventurous. I don't like rules in any part of the recording process because it's rock 'n' roll — you've got twelve chords — how much can you do with it that hasn't already been done? If you want it to come off perfect, you might as well do classical music. That's too soulless for me.

Clif Norrell: I try to do my own thing in terms of the directions that people give me. The only person that had something to say

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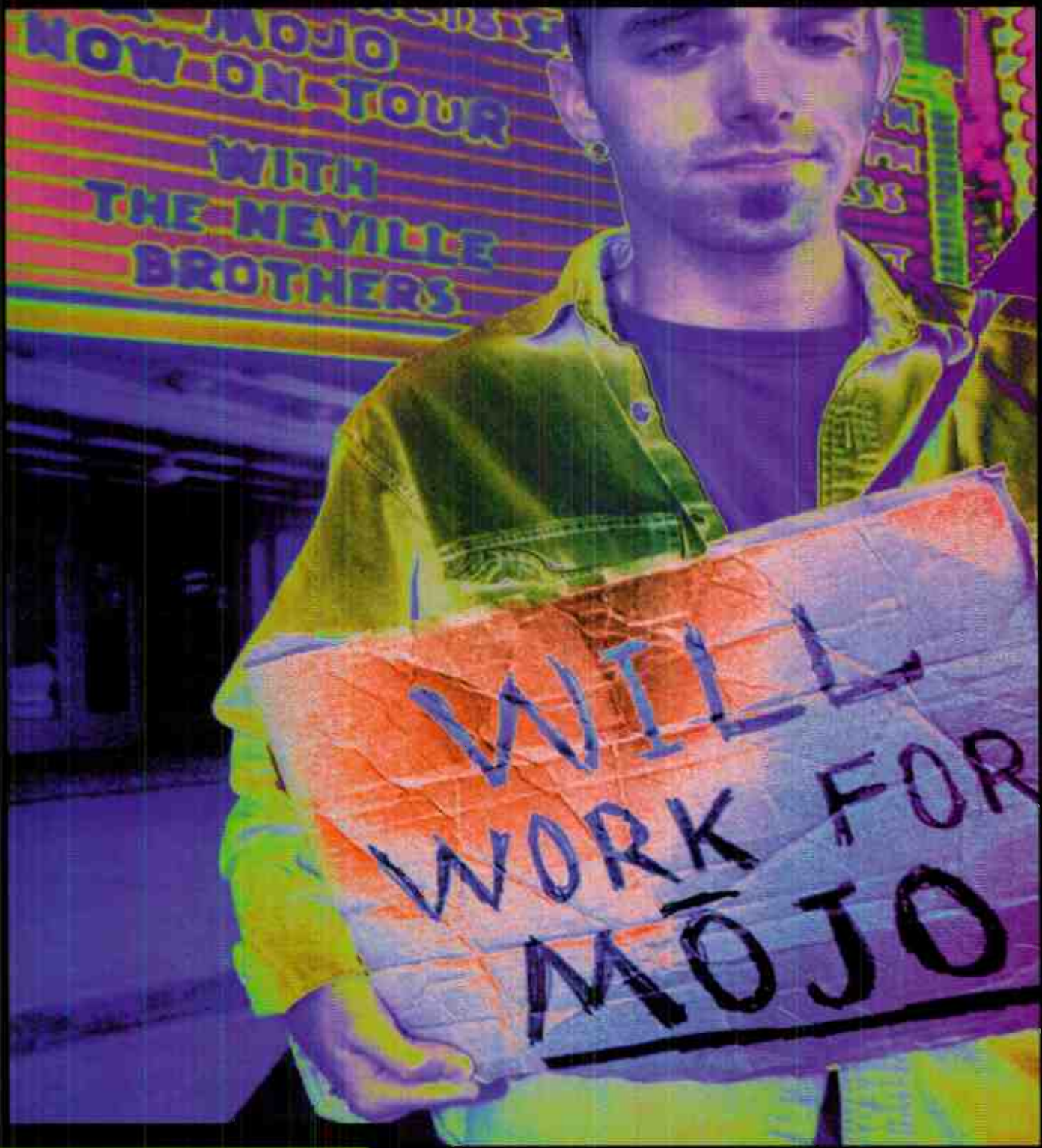

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THE ONE THAT GOT AWAY?: Rollins demonstrates the size of the sound he wanted.

in the band was Melvin [Gibbs], the bass player, and he really set us off in a direction on his sound. He uses a pedal board of different effects and he had his own system mapped out of how he wanted to run his signal. What we did with his sound was under his direction and it worked out great. We took one Avalon DI straight off his bass and we recorded that with a slight amount of compression and no EQ. We also ran his signal through his pedal board and into another DI and we put that on a different track. Then, his different effects pedals fed two different amps with two different cabinets. One was an 18-inch for that fat sub-bottom sound and he had another signal path feeding a 4 x 12 guitar cabinet that handled a lot of the high-end stuff, including wah-wah and some severe distortion. I miked the 18-inch with a 47FET and I used a 421 on the 4 x 12. So we ended up with four tracks worth of bass, and we can really get into that when we're mixing and we'll be able to create this really big sound.

The whole album has a really huge, girthy, sound. How many tracks did you use in total?

Thompson: We ended up with 12 overall drum tracks, four bass tracks, and usually three guitar tracks (two rhythms and a solo). Sometimes we'd add this heavy distorto-tone to Chris's rhythm sound that actually blends into the whole rhythm section to give it an extra dimension. Henry's mainly one vocal track, and maybe we'd double a chorus here or there to make it a little richer. We also added one or two tracks of percussion to some of the songs, as well. Everything that we do is 24 tracks and under. I figure if the Beatles had four tracks to work on, with 24 tracks we should be able to put everything, including the kitchen sink and then some, into the mix. To go over 24 tracks to me is ludicrous.

Norrell: A lot of the performances are actually from the live tracks. We kept a lot of the guitar tracks and some of the vocal takes, as well.

Thompson: When we first sat down I told Clif that I wanted to be in a situation where we could save and use anything that went to tape. I told him that we had to pay attention and get the right sound the first time. I'm really happy because we were actually able to marry overdubbed vocals with the live performance and it still feels like the same performance. That's another thing that I can be a stickler on. A lot of people like to comp vocals and go word for word, but to me, that's not a performance. You have to have at least 80 percent of a track down cold and then you can go back and touch up the remaining 10 or 20 percent. People want to hear something believable.

How did you coax the vocal performances out of Henry? Is it safe to assume that you used a handheld mic?

Norrell: We did use a handheld mic.

continued on page 136

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How Much is That ADAT in the Window

Some caveats and tips on buying a used Alesis digital multitrack recorder

BY BENNET SPIELVOGEL & EDDIE CILETTI

Unless you've been in jail, under heavy sedation, or on an uncharted Pacific island, it's highly unlikely you've missed one of the most significant developments in audio recording. We're not talking about self-adjusting, color-coded guitar picks or some quirky, retro processing unit. The machine that knocked the entire industry for a wicked loop is, of course, the Alesis ADAT.

Over eighty thousand, word has it, ADAT-compatible machines have been sold — that's quite a lot for our industry. The ADAT has single-handedly been responsible for bumping most of the narrow-format analog multitracks into the "home/hobbyist" category. The Alesis ADAT-XT is likely to have a similar effect on the Original Formula ("OF") ADAT — hence this article — which offers a few ways to evaluate a used classic.

RECOGNIZING THE VARIATIONS

The earliest (oldest) ADATs are easy to recognize: the ADAT logo on the upper right is blue-black and silk-screened onto the faceplate. (The Fostex RD-8 is essentially an Original Formula ADAT with built-in SMPTE timecode.) In May 1994, Alesis went to a silver plastic logo that is glued onto the faceplate. These machines delineate the transition from firmware version 3.06 to 4.0. This upgrade gave users extended features, including increased record/playback times (from 40 minutes to over 60 minutes).

To check the firmware version, hold the SET LOCATE key and press FAST FORWARD. The current firmware level appears on the LCD. All black-faced ADATs can be upgraded to the most current firmware (version 4.03). (*Note:* Alesis ceased production of its Original Formula in November 1995.)

KICKING THE TIRES

Once you've located some likely suspects you can narrow your choices by following this advice:

Consider the overall appearance. The ADAT chassis is constructed from sheet metal onto which the transport is mounted. Severe mechanical damage to the external case and/or a warped front panel is cause for closer scrutiny and may possibly be a disqualifying factor. (The XT uses a die-cast chassis that is extremely resistant to "warp factors.") Most ADAT tops and bottom panels get scratched from being swapped in and out of racks. It ain't pretty, but it doesn't affect performance.

Check the mileage by pressing SET LOCATE and STOP. The number on the alphanumeric display indicates how many hours the tape has been in contact with the rotary heads. Thus, "0060" means sixty hours of contact while "4234" indicates over four thousand hours. Expect to pay more for machines showing fewer hours.

WHO IS SELLING?

There are at least three categories of ADAT user:

1. People who have been heavily using their ADATs and are switching to XTs for their increased wind and lock-up speeds.

2. People who need the ADAT for compatibility with the outside world, but do most of their work via MIDI and hard disk.

3. People who thought they would use the ADAT more but never got 'round to it.

The bottom line? An ADAT that's been on a schedule of regular preventive maintenance should chug along quite nicely. From all sellers, ask for the Operator's Manual (it's worth having), the LRC (Little Remote Control), optical and sync cables (if possible), and copies of maintenance receipts (if available).

User #1 is likely to have lots of head hours, but the machine should have up-to-date firmware and hardware. User #2 will have less time on the drum, the machine should look pretty good, be up to the latest firmware, but may need routine maintenance. User #3 will have minimal head hours, but the machine should be checked by Alesis and/or a qualified tech for firmware, circuit board revisions, the type of head, and related

SMART SHOPPER: Used ADATs offer a great value — if you know what you are looking for.

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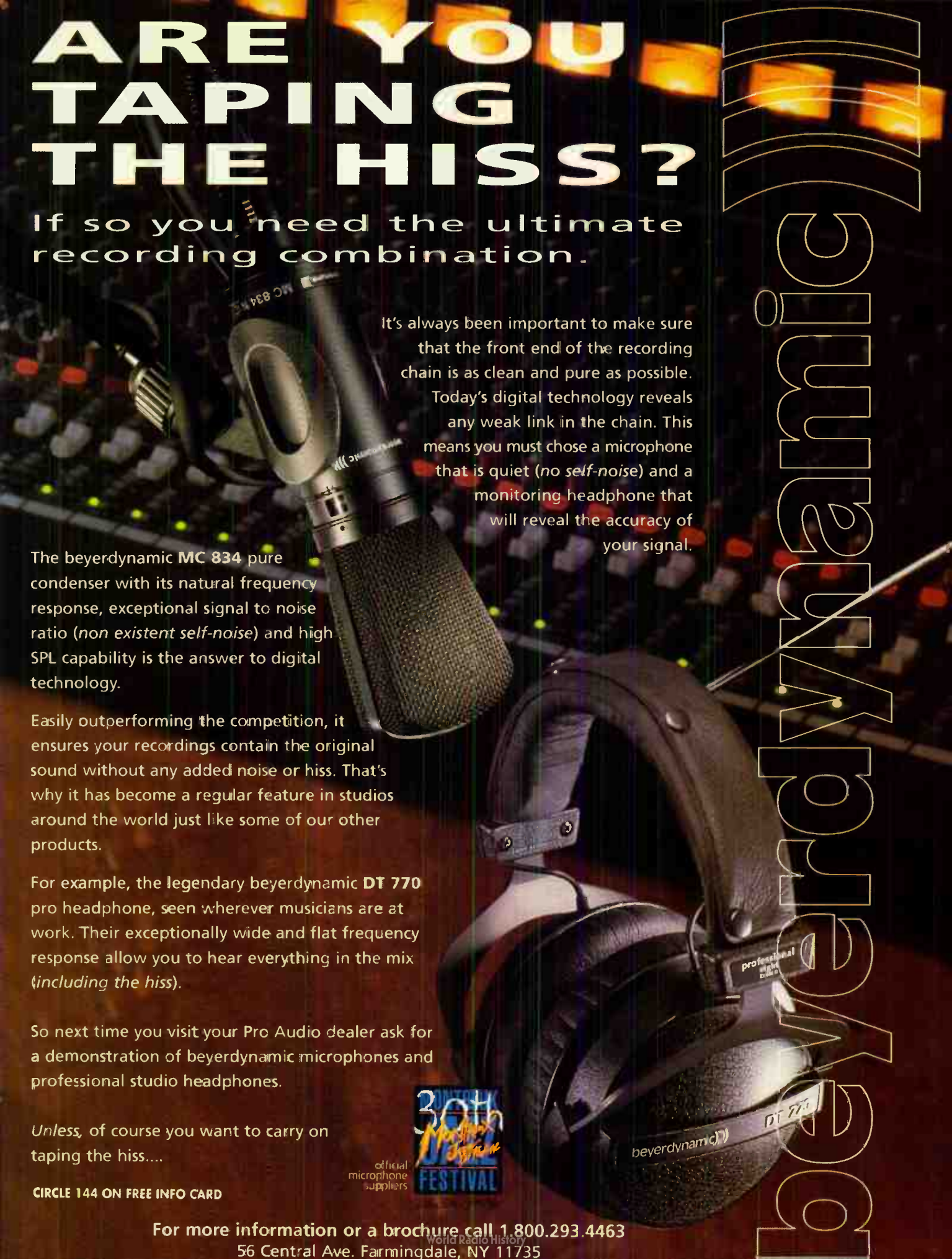

It's always been important to make sure that the front end of the recording chain is as clean and pure as possible. Today's digital technology reveals any weak link in the chain. This means you must chose a microphone that is quiet (*no self-noise*) and a monitoring headphone that will reveal the accuracy of your signal.

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SHOW OF SUPPORT

By Jeff Klopmeyer, Alesis Corporation

Whether you've just purchased a pre-owned ADAT or have been using ADAT for years, there is no better way to ensure its long-term reliability than to have it regularly maintained by a professional service center that's been authorized by Alesis for ADAT servicing.

Over the past two years, Alesis has made efforts to make maintenance and repair of our gear as quick and easy as possible. The first step in providing service has been the improvement of our Technical Support department. Four years ago, you might expect to stay on hold for 20 to 30 minutes (or more) before getting through to a tech. Right now, these hold times average less than six minutes, due to our state-of-the-art automated phone system and the addition of several full-time Technical Specialists. Plus, we've reinstated our toll-free number (800-5-ALESIS) for calls relating to service issues, and opened up e-mail communication for this purpose as well (alecorp@alesis1.usa.com).

The second step is the expansion of our nationwide network of authorized service centers. In addition to Alesis's in-house service team, there are now 43 authorized centers in the domestic USA. Each of these centers can provide warranty or nonwarranty service on ADATs. By providing these service options, the workload of each center has lightened considerably, making turnaround time for service and maintenance much faster than it was just a few years back.

What does "regular ADAT maintenance" mean? Alesis and its service centers have a set of guidelines that will tell you when your ADAT is due for maintenance. Much like changing your car's oil every 3000 miles, regular ADAT maintenance helps to avoid bigger, more costly problems later on. Even if you think your ADAT is performing normally, hold the SET LOCATE button and then press STOP to check the head-on hours. Be sure to ask the ADAT's previous owner about its maintenance records, then look at the overview of maintenance procedures below to determine the necessity of servicing the unit.

Every 250 Head-On Hours: The ADAT's tape path and idler wheel should be professionally cleaned.

Every 500 Head-On Hours: In addition to the above, the tape tension and pinch roller should be checked, and the service center should put the ADAT through its built-in self-test routine.

Every 1000 Head-On Hours: In addition to the above, the ADAT's tape path should be re-aligned, the motor checked, and tests should be performed to check the performance of the ADAT's digital and sync interfaces as well as the unit's audio quality.

Every 3000 Head-On Hours: This is the time for a transport overhaul. In addition to the above, the headstack and motor should be evaluated and several parts should be replaced.

By following these simple, relatively inexpensive procedures, your ADAT can stay in tip-top condition for years and years to come. Contact Alesis for specific information on service center locations, turnaround times, and costs of these recommended maintenance procedures. Alesis has made our post-sale product support a huge priority, but we always want to strive toward our goal of offering the best service support available in the professional audio industry. If you have any suggestions on how we can improve our capabilities in this area, please let us know.

peripherals. A single machine, running version 3.04 firmware (for example) may behave well alone, but may not be a team player when asked to lock-up with other machines. Multiple machines should all be running the same version. (More on team spirit in a moment....)

FIRST AND SECOND OPINION

If the seller will pop the cover, check the area around the rubber tire (between the two reel tables) for shedding. Check the pinch roller to see if it looks "glazed" and be sure the capstan is clean and shiny, not encrusted with tape oxide remnants. If necessary, use a cloth *dampened*, not saturated, with low-moisture alcohol to clean the capstan. Avoid excessive saturation because alcohol will dissolve the lubricant in the capstan bearing. For cleaning rubber parts, use Athan ATH-500-CS (Tel: 415-589-5206) or a water-based cleaner, such as Windex.

Before your purchase, contact Alesis technical support at 310-841-2272 for the nearest service centers in your area. Compare service charges and turnaround times. Get a serial number and confirm the unit's age with Alesis. (This may also weed out possible "hot" boxes.) The primary ADAT intermittent problem is due to a dirty Mode switch. If there are no service records for the past year and a half, get on the good foot by having the switch and all rubber parts (including belts) replaced.

EYES ON THE PRIZE

Here are a couple of basic tests to determine transport condition:

Remove the top cover of the ADAT and load a tape. Once the tape is wrapped around the drum (called the Engaged mode) check basic transport functions such as play, fast forward, and rewind. Watch the tape as it moves around the guides and through the capstan and pinch roller. (You should eventually get familiar with what "normal" looks like.) Tape movement should be smooth and there should be no slack during fast wind or spillage during stop.

For example, press Rewind in the middle of a tape and watch the take-up side. Look for slack as the machine gets up to speed. Now press Stop (no slack or loops) and then press Stop again. The tape should disengage from the head drum assembly. Press Fast Forward (the tape is still disengaged from the head) and look for smooth travel from the supply to the take-up reel. Try these exercises at the beginning, middle, and end of the tape, looking for consistent performance at each location.

Note: If the supply and take-up reels do not come to a complete stop, the brake solenoids are either out of adjustment or have failed. If tape continues to be pulled out of the cassette shell in Stop mode, the pinch roller may not be sufficiently clearing the capstan. A minor adjustment could be all that's required, but an intermittent problem is more likely Mode-switch related.

AVOIDING MOANS AND GROANS

Loud mechanical sounds during fast forward or rewind are minor problems

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that can be resolved by lubricating the impedance and tachometer rollers or by replacing the tachometer belt. (See Bennet's August '95 "ADAT in the Trenches" and Eddie's October '96 maintenance column.)

If problems are noticed toward the end of a reel, suspect either supply tension, take-up tension, or pinch-roller pressure. Fast forward to about 35:00 minutes and save that as Locate 1. Fast forward to about 38:00 minutes and press Set Locate 2. Use the Auto 2 > 1 and Auto Play features to continuously run this loop. The tape should be formatted, signal should have been recorded on all tracks, and you should also punch in on each track during the loop. (A portable CD player can be your source and any mixer or amp with a headphone output can be used for monitoring.)

If the error display decimal lights up after repeated loops, either performance is marginal, damage is being done to the tape, or the tape itself is at fault. There should be no analog distortion when the machine is in Input mode or digital noise at the punch-in/out points. If the ma-

BRIEF DIGITAL 8-TRACK TECHNOLOGY OVERVIEW

The difference between the cassette-based digital multitracks and analog tape recorders is the helical scanning (rotary) head. The format was originally designed for video recording and modified for digital audio. That eight tracks can be recorded on S-VHS or Hi8 tapes is amazing enough, but that the machines can also be daisy-chained for additional tracks is icing on the cake. Both formats support a full-featured remote control — the BRC and the RC-848 — the former controls all decks plus includes a SMPTE timecode interface. (An optional SY-88 card adds SMPTE capability to the DA-88.) Almost any music store or recording supply business can give you an extensive demo.

With analog machines, tape speed, noise reduction (if used), and alignment (easily checked with an oscillator and VU meter) are variations based on a common magnetic concept. For example, if you put a 1/4-inch stereo recording on an 8-track deck, sound will come out. There are, however, several digital formats — none of which are even remotely compatible and all being much more elusive to the process of interrogation. The closest thing to a VU meter is an error-rate display, and often this is only a blinking LED.

Reel Advice

Buyers should determine the cost of head replacement and related work factoring that information into price negotiations for machines whose head condition is questionable. Prices vary, so shop around and average the estimates — don't take only the low-ball and consider $750 a worst-case figure.

Otherwise, the only way to predict a tape machine's future requires a test tape (or two) plus an oscilloscope. This will set you back about $1500 — somewhere near the maximum of what a used ADAT-OF should cost. Again, it is important both to establish a good relationship with a service center *and* have spare machines on hand.

Zooming In

Test tapes are created on machines whose alignment is referenced to precise mechanical and electronic standards. The mechanical alignment — tape path — can't be viewed directly by eye. The oscilloscope "looks" at the electronic signal from tape — the RF envelope — from which the technician makes adjustments to optimize performance. (See Eddie's August '95 and September '95 maintenance columns.)

Simply viewing tape path with a user-made tape is not likely to reveal any major flaws. Test tapes designed for aligning helical-scan machines use a special recording "format" that differs from what a standard recording looks like. In essence, test tapes trick the machine into disabling its automatic tracking system in order to reveal flaws in the mechanical alignment.

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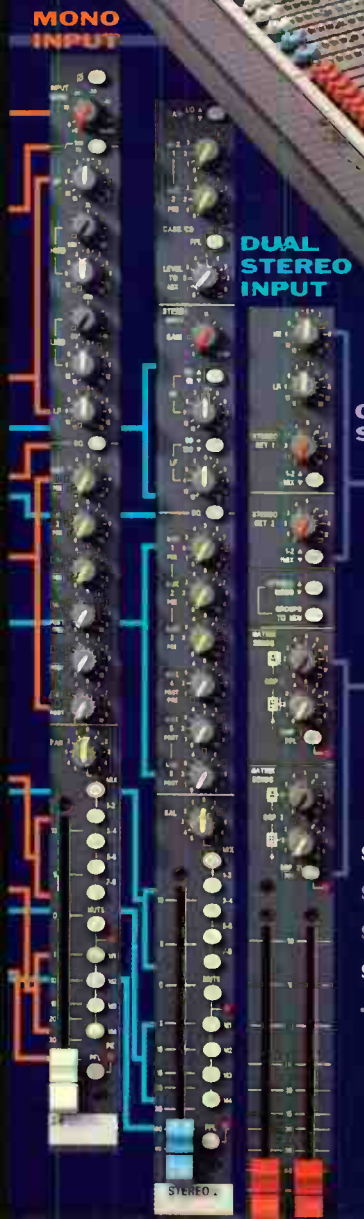

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chine passes these tests, it is in good working order as a "soloist."

TEAM PLAYER PERFORMANCE TEST

This last ADAT test is for system compatibility — how the machine gets along with others. For consistent lock-ups, it is important that each machine get to the locate point at the same time, otherwise a slacker will hold up the rest of the system. When the ADAT is in unthreaded, Fast-Wind mode, the tape counter relies on information received from a reel-table tachometer. (In threaded Fast-Wind modes, it is able to accurately read timecode information from tape.) A major difference between tachometer "predictions" and tape-accurate code will cause lock-ups to be sluggish.

1. Format two new tapes, of the same length, brand and batch.
2. Label one "Master" and the other "Slave."
3. Connect only two machines at a time using an officially sanctioned sync cable.
4. Power up the last machine first.
5. Insert tapes into the respective machines.
6. Press Locate Zero on the Master. (Slave should follow.)
7. In Unthreaded mode (press Stop twice), FF to 10 minutes and stop.
8. In Threaded/Engaged mode, each machine should be within twenty seconds of actual tape time.
9. Set Locate 1 at ten minutes, then FF in Unthreaded mode to forty minutes.
10. Stopped units should be within thirty seconds of actual tape time.
11. Set Locate 2 at forty minutes, then Locate Zero in Unthreaded mode.
12. There should be 15 seconds or less difference.
13. For machines that fall within spec, make fastest/least-hours machine the last unit in the chain.
14. The best medicine for out-of-spec machines is to schedule maintenance for "The Team." Take all the machines to one technician (at the same time) so that performance can be optimized.

**The above test does not apply to the XT.*

LUNCH: THE FINAL FRONTIER

Knowing the cost of routine service should be a tool that can be used during the bargaining process, as well as a reality that should be factored into all tape-based systems. Perhaps before you start shopping, it wouldn't hurt to make friends with your local service facilities and...take a technician to lunch! EQ

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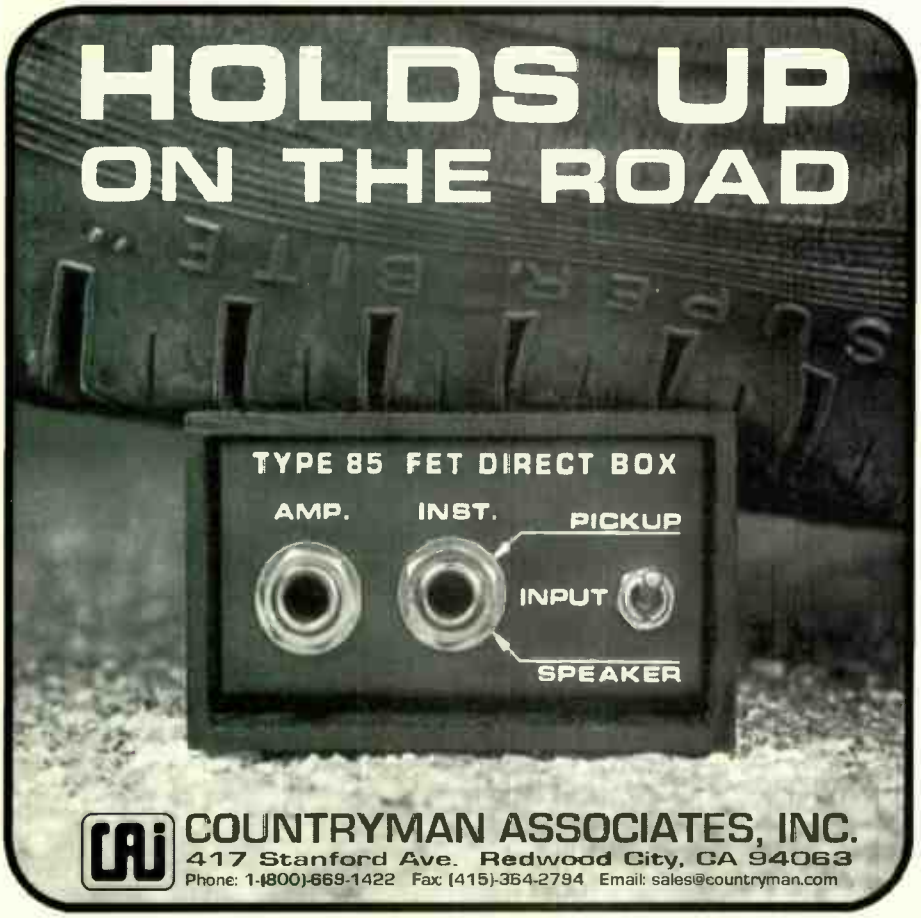

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In today's professional project studio, you may be mixing music on Monday, cutting audio-for-video on Tuesday and spend Wednesday creating sounds and voiceovers for multimedia projects. That's why the Alesis **Point Seven Shielded Reference Monitor** 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, ±3dB. 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.

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For more information on the Alesis Point Seven Shielded Reference Monitor, see your Alesis Dealer or call 800-5-ALESIS.

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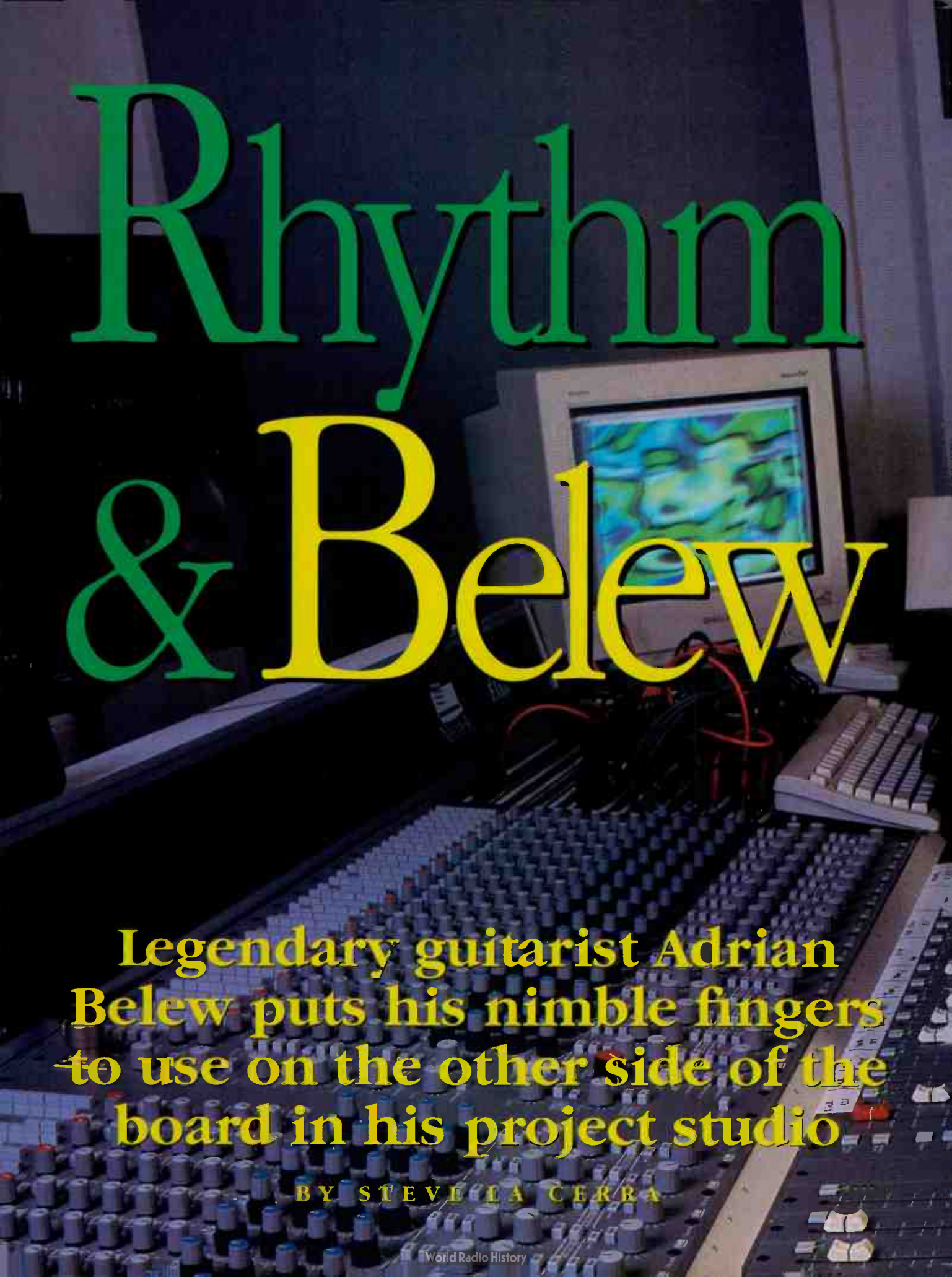
Rhythm & Belew



Legendary guitarist Adrian Belew puts his nimble fingers to use on the other side of the board in his project studio

BY STEVE LA CERRA

World Radio History

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Photos by Beth Gwinn

CAN'T ZOP NOW: Adrian Belew (with engineer Gary Hedden) produces his first project-studio solo record.

EQ: What are some of the advantages and disadvantages of having a studio?
Adrian Belew: I can't think of any disadvantages apart from the cost. I think you save money if you are productive enough and have the kinds of outlets that I have for the variety of material that I can produce out of my studio. I think that it's a very good investment *if* you invest wisely. It forces you to be productive — not that I wouldn't be productive anyway, but it allows me to be more productive. It gets to be a daily regime that I want to use my studio in some way. Let's face it — for me it's a dream come true because my favorite mystery in life has always been the recording studio. A place where you go, make something out of nothing, and then play it for other people. The recording studio is my favorite place to be, and now I have one connected to my house.

What gear did you decide to use?
We had a basic philosophy that went like this: don't worry so much about the cost of the recording apparatus. Rather than buy an expensive recording machine, we bought ADATs realizing that someday hard-disk recording will come in and we won't have any tape at all. We decided to invest in three different things. One was the best board that we could afford in our range; second, a lot of outboard equipment (especially things of a tube nature that would offset working in the digital domain); and, third, rooms that are really correct.

We called in an engineer named Gary Hedden who I had worked with before and who (for 25 years) has designed studios. He has a unique way of correcting the rooms in one's home. He brought in a computerized system to measure sound in the rooms and identify the problems. He then applied that knowledge to make a system of baffles that are attached to the walls. They look really cool, but they also correct the sound of the two rooms. For the board we wanted something that wouldn't color the sound so much and has the reputation for being a good, solid console without a lot of bells and whistles. It would have been nice if we could have afforded automation, but, frankly, I have gotten used to not having it, and it is fun to go back to manually doing everything. We chose a Neotek Elan 48-channel console and it's a beauty. I really like it.

Do I understand correctly that you brought Gary to do room correction as opposed to building rooms from the ground up?
That's correct. We looked high and low for a house in which we could have a separate quarters with an area that was big enough for the studio. When Gary came in, he rebuilt some walls, rerouted all the ventilation, and then built this baffle system throughout the rooms.

In regards to your guitar tones, how much of a role does the studio gear play as opposed to the tone coming from your amplifier?
Most of my tones come directly out of the amp the way I want them to sound. Of course, there will always be some EQ and I might add a bit to them, but in terms of using the outboard gear for delay, chorusing, and such, that rarely happens. If there is something in the studio that I know that I want to use in particular song, I just go straight into the board and use it.

Did you encounter any technical problems in recording your new album, *Op Zop Too Wah?*
No, I can't think of any. We're rolling along here now. We have a studio that works and we've even had a hit record out of it — something that surprises the heck out of me.

Referring to the Jars Of Clay tune, "Flood"...
Yes. That project was the first one that I brought into the studio after its completion. In a sense, it was done not only because I like the band, but also because I wanted to have a band come in and try out my room. I rarely have more than myself playing on my records. They were here, we did two songs, and now it's up to around 1.2 million records. Of course, I am very happy for Jars Of Clay, but it also proves that the studio is at a certain level and it proves my ability to produce hit records, given the right material.

***Op Zop Too Wah* was completely recorded and mixed there?**
Yes.

Was there a band supporting you on *Op Zop Too Wah?*

Op Zop Too Wah *is quite an unusual name for a record, but, then again, Adrian Belew is quite a unique musician. As a member of King Crimson and a guitarist's guitarist, Belew has always pushed the limits of the instrument — sometimes making it sound like an elephant or even a chicken.* Op Zop Too Wah *is Belew's most recent solo offering (Caroline Records) and was completely recorded and mixed at his new project studio. In that studio he also produced several songs for the band Jars Of Clay, one of which, "Flood," is currently a hit single. In between writing for King Crimson and working on his next solo projects,* EQ *was able to speak with Belew to discuss (among other things) the role his studio played in the making of* Op Zop Too Wah.

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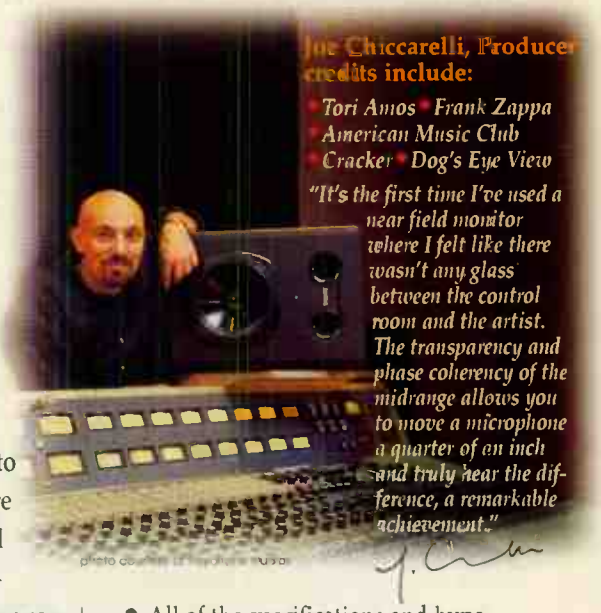

Joe Chiccarelli, Producer credits include:
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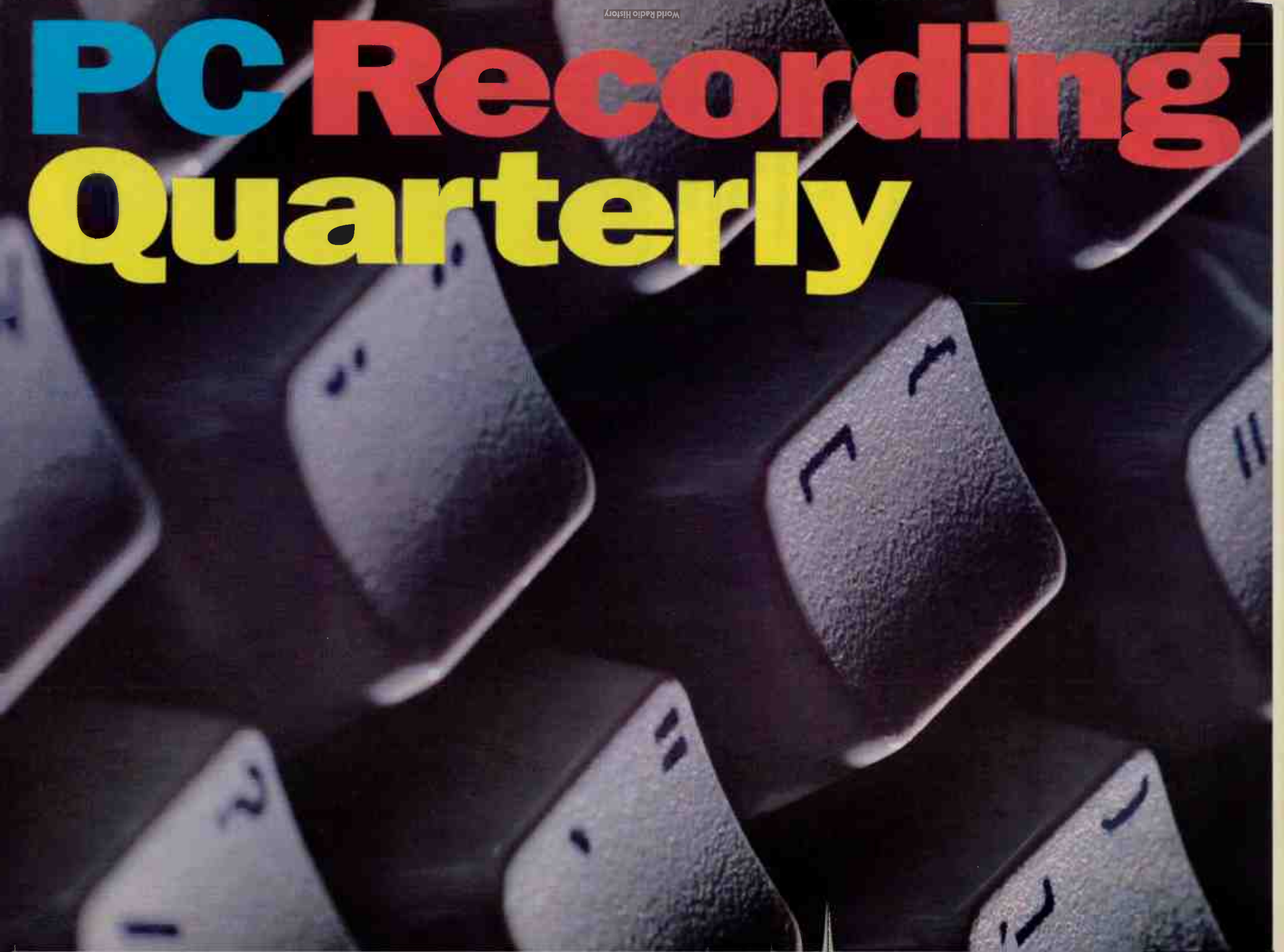

ENTER HERE. It's time once again for EQ's quarterly look into the world of PC Recording. In this issue, Craig Anderton reveals how to get started in recording with a PC and David Miles Huber gives some tips on troubleshooting Windows 95. Also included is a review of Voyetra's Digital Orchestrator.

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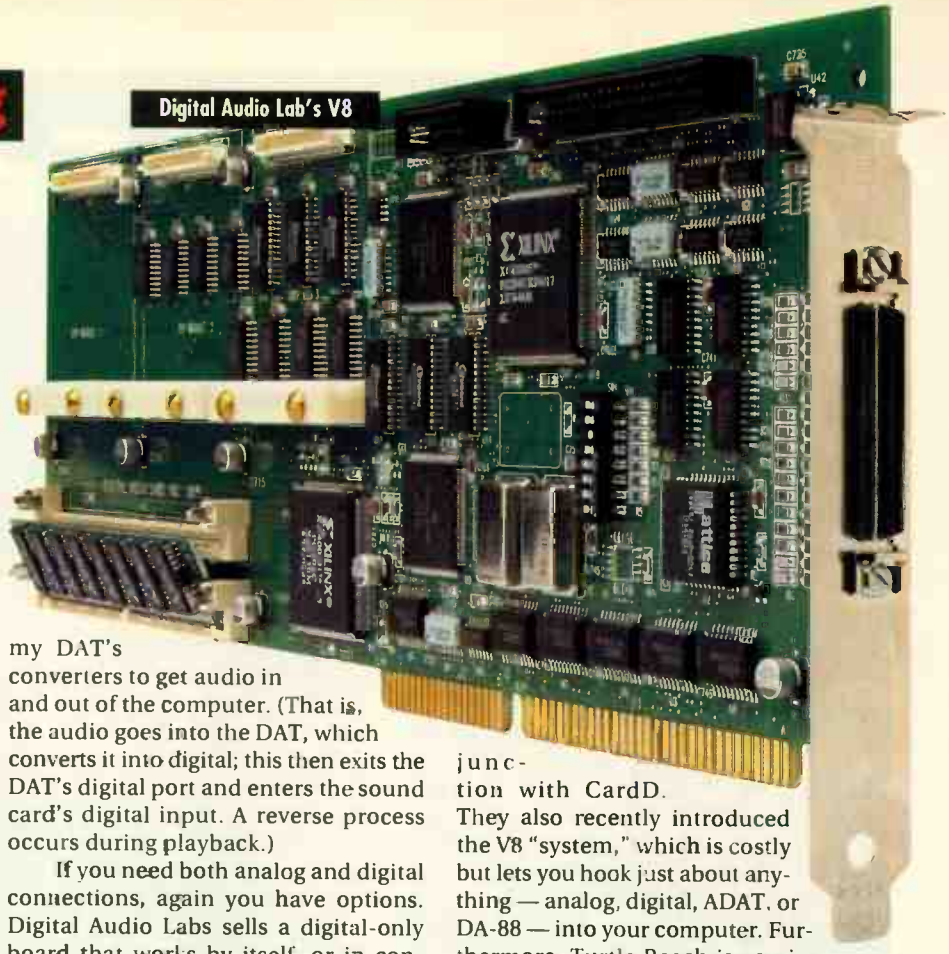
Digital Audio Lab's V8

can do a lot with a basic sound card — especially the better ones, although the specs will probably not be CD-quality. One factor is that not all A/D and D/A converters are created equal, and you can bet they're not using a $100 chip set in a $50 card. (If you do get a simple sound card, check for a WaveBlaster-compatible connector. This lets you piggyback a sound generator "daughterboard" that typically produces higher quality sound than the on-board synthesizer.)

The next step up is an audiophile sound card, such as Digital Audio Labs' CardD or Midiman's DMAN. These ditch the cheesy synthesizer, include much better converters, and boast superior noise and distortion specs. Of course, you will pay more, but hey, it's not a perfect world.

Since a computer is (electrically speaking) a pretty noisy environment, it's hard to keep audio clean once it enters the box. Pro users prefer digital-only sound cards that send and receive S/PDIF or AES/EBU signals. I use the AdB board in conjunction with my DAT's converters to get audio in and out of the computer. (That is, the audio goes into the DAT, which converts it into digital; this then exits the DAT's digital port and enters the sound card's digital input. A reverse process occurs during playback.)

If you need both analog and digital connections, again you have options. Digital Audio Labs sells a digital-only board that works by itself, or in conjunction with CardD. They also recently introduced the V8 "system," which is costly but lets you hook just about anything — analog, digital, ADAT, or DA-88 — into your computer. Furthermore, Turtle Beach is coming

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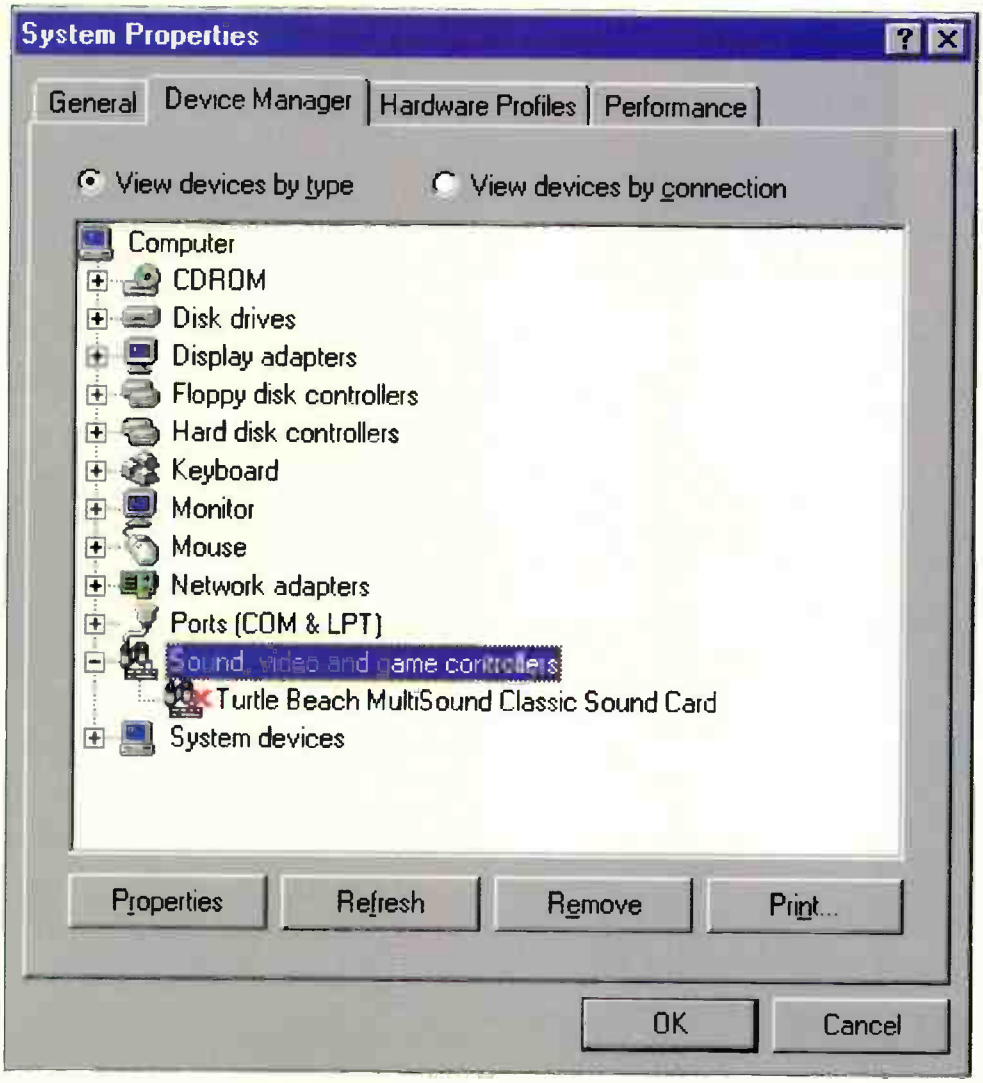
Taming the Savage Beast

Troubleshooting tips for Windows 95

BY DAVID MILES HUBER

OK, FOLKS YOU'VE had your fun! You've installed Windows 95 and finally plugged n' prayed enough that you've gotten most (if not all) of your hardware going, and have had time to take a long hard look at the operating environment of the future. All's at peace in the world. But wait! You've just gotten that cool, new hardware toy in the mail you've been waiting weeks for. Unsuspectingly, you plug in the card and follow the setup routing, only to find that the software was written poorly, the setup routine is totally botched up, and your computer has suddenly fallen onto bad times. Oh, oh, how quickly your Win 95 world can be turned upside down!

This not-so-fictitious scenario (and others of different flavors) happen more often that we'd like whenever swapping out or adding new hard- and software. So where can you turn to fix your latest configuration woes? Let's take a quick look into the nooks and crannies of Win 95.



TROUBLESHOOTING METHOD #1: The Device Manager

THE FABULOUS FOUR

Basically, there are four areas where you can put on your '95 troubleshooting hat. These can be found within the System Property's Device Manager window; the Registry; Initialization (.ini) files; and Sysedit.

DEVICE MANAGER

Probably the best and fastest way to troubleshoot general hardware problems and conflicts is through the use of Win 95's Device Manager. Unlike install diagnostics within DOS or Win 3.X, Device Manager provides a fairly simple, straightforward graphic interface to your PCs overall hardware configuration. This application can be easily accessed in either of two ways:

1. By selecting Start | Settings | Control Panel and then clicking on the System icon in the Control Panel or more simply...

2. Right click on My Computer and select Properties.

From within the System Properties window, select the Device Manager folder. This will give you a full display of the hardware device settings that are currently in use by your computer. If a major hardware problem exists, it should graphically appear within this window. For example, clicking on the "Sound, Video and Game Controllers" icon will reveal a full list of your installed media cards (drivers that aren't fully '95 compliant may not show up in this list, even though they're active).

Before beginning your investigation into any problem, it's always a good idea to make a printout of your system's hardware properties. This should be done even if your computer's working fine, just in case you run into future trouble or want to plug a piece of hardware back into the system at a future time. A specific device, class of devices, or

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Alex Marcou - Abbey Road Studios "Apart from being analogue, the VI-1 makes hard sounding digital sound like crap, instantly and give it go to listen to. The icing on the cake is that the EQ2 Pre Amps & Compressor are a crime here."

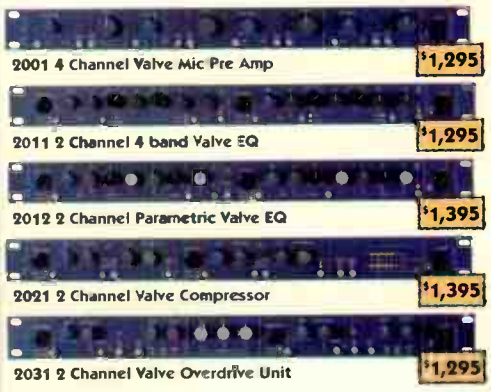
Andy Jackson - Pink Floyd (Sound engineer) "All the lead vocals on the 'Division Bell' album were run through the EQ-1. I certainly prefer the EQ-1 to other valve Equalisers for vocals. The new EQ-2 is probably the best all round EQ I've ever used."

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

Tom Lord-Alge (Dual Grammy Award Winning Engineer) - "The mellow EQ-1 EQ has given me the ability to EQ with clarity, rather than just tone. I find it to be very musical. Any problem sound I have come across, I switch in the 2091 and it allows me to add depth and clarity."

Stephen Croes (Producer, Arranger, Engineer - Fleetwood Mac, Kenny Loggins, Steve Winwood) - "The Indigo 2011 EQ and 2031 Compressor are exceptional, both versatile and flexible. I can always get the sound I want and I'm confident that anyone who buys one will be very pleased with the results."

INDIGO



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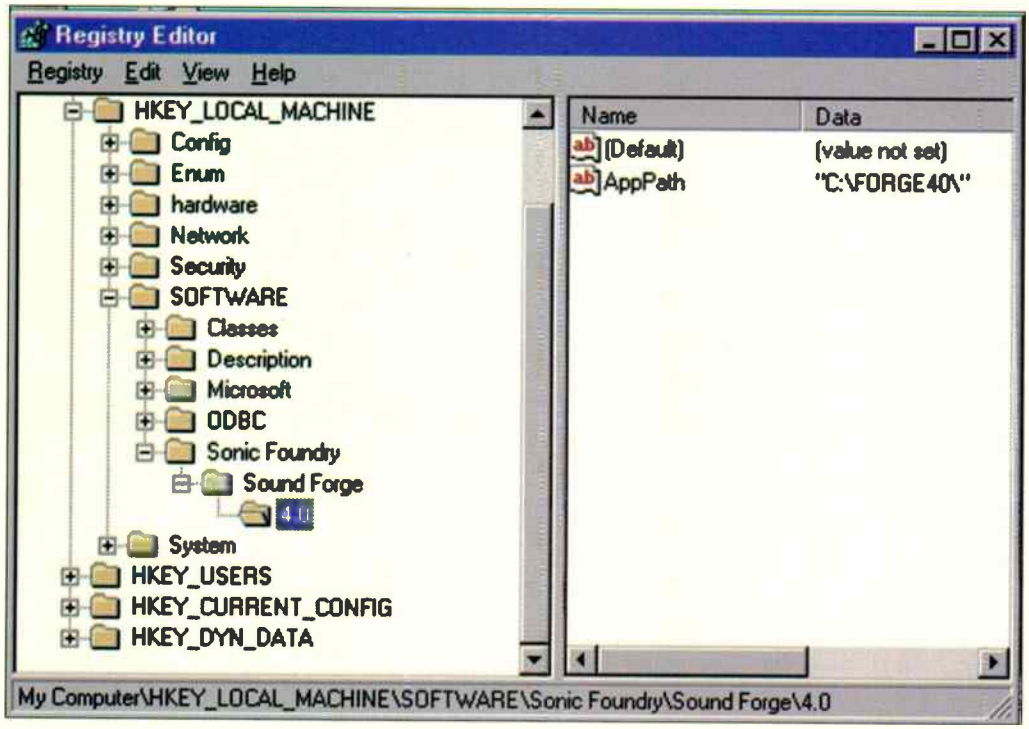


TROUBLESHOOTING METHOD #2: Registry

complete system summary can now be printed out by simply clicking the Print button.

OK, let's assume, for example, that the new toy in the door is a whizbang sound card that isn't working. The Device Manager will generally display either a black exclamation mark (indicating a problem with the device), or a red X (indicating that the device isn't working at all) directly over that listing. Clicking on that device will then open its Properties window, which will give you access to additional hardware setup info. If a Properties Resource folder is available, it'll display all of the device's relevant IRQ, I/O, and DMA settings, and, should a conflict arise, often the source of the problem will be listed in the Conflicting Device List window. To change settings, you can simply deselect the "Use Automatic Settings" box and make the desired changes in the Resources Settings window.

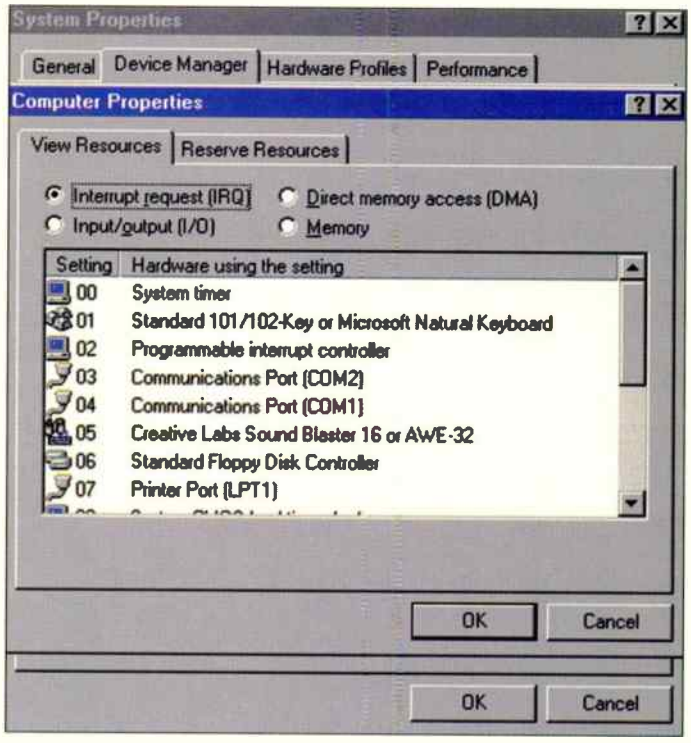
Using the Device Manger, it's also possible to view all of your computer's IRQ, I/O, DMA, and memory settings, making it a simple matter to choose an available setting just by glancing at the list. This is done by clicking on the word "Computer" at the top of the Device Manager list, clicking on the Properties box, and choosing the appropriate resource parameter.

REGISTRY

In theory, Win 95's Registry is a central depository of anything and everything that applies to the configuration of your PC. Its intention is to hold all of the hard- and software setup information that was originally contained within the numerous initialization files that existed within Win 3.X. Let me give you an example of how the registry can come to your troubleshooting rescue:

Recently, I installed a piece of hardware whose setup routine was truly bogus. When I was asked as to where I wanted to place the file info, I instructed it to be placed in a subfolder of an associated program. This wasn't the software's basic default setting, and that's when all hell broke loose. Not only wouldn't it load the file and its related data to the folder, but upon running setup again, it would default to the ill-fated directory (and even re-create it when I manually deleted it) and the install would again fail...Catch 22! Well, it turned out that a setup file was created in the registry that would associate the program improperly until I finally searched out and deleted the culprit listing.

So how do you get into the Registry? From within the main Windows 95 directory (Windows.000 for you upgrade puppies), you can simply double-click on the Regedit.exe application. This will give you immediate access to the Registry. Once there, you can browse for any potential setup culprit. You should be aware that Registry editing isn't for the squeamish and you might want to perform a hard-disk



IRQ-SOME TASK: Win 95 lets you easily see — and change — settings.

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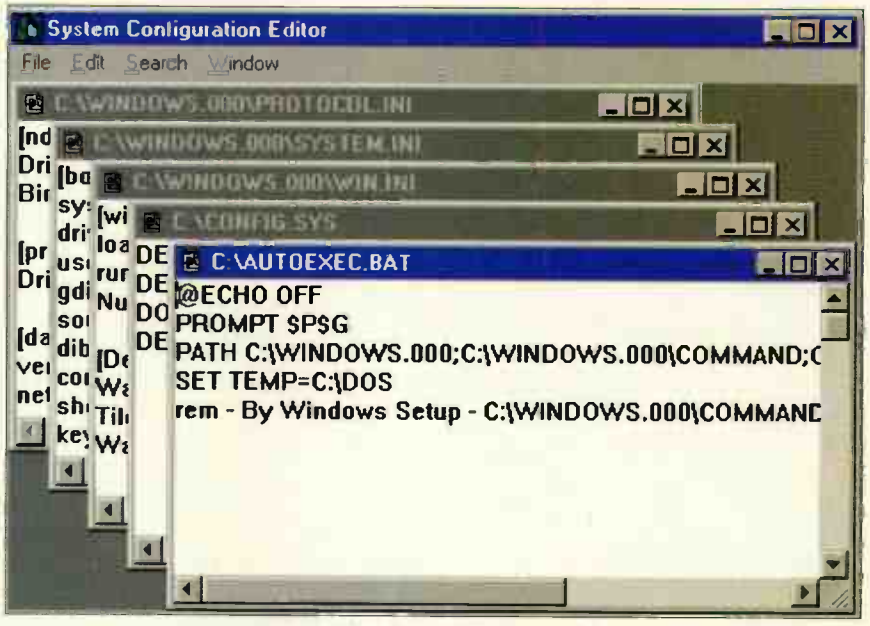

TROUBLESHOOTING METHOD #4: Sysedit

backup before making any major changes.

INITIALIZATION (.INI) FILES

Even though the Registry was intended to replace the many Initialization files that existed with Win 3.X, they can still pop up. These small files contain information as to program settings, user preferences and other options. It's enough, at this point, to realize that an .ini file containing misdirected information can be a potential sore spot when it comes to install problems. For example, I recently launched a Win 3.1 shareware program directly from my CD-ROM drive. Upon deciding that I wanted to install it to my hard drive, I found that I couldn't open it from the hard drive without having the CD in its drive. Nothing that I did could solve this minor dilemma, until I finally went in and deleted the .ini file.

Please keep in mind that I'm not advocating that you go in and delete files in order to solve your problems. You may end up with a headache that's bigger than the one you started with. Also, don't view the deletion of these files or any Regedit entries as a means for uninstalling a program. Performing uninstalls are best done from the install/unistall application within Win 95's Control Panel. It's just important to realize that, when all else fails, sometimes the kamikaze approach may be your only option.

SYSEDIT

Finally, one other hiding place for searching out installation and set-up problems is within the old standby known as the System Configuration Editor (or Sysedit, for short). Sysedit allows for the easy readout and alteration of system setup information within DOS's main Autoexec.bat and Config.sys; as well as Win 95's Win.ini, System.ini, and Protocol.ini configuration files. It can be easily called up by double-clicking on the Sysedit.exe application within the Windows/System directory.

MY 2 CENTS

As you're almost certainly aware, it would be next to impossible to list all of the potential problems that arise during even typical hard- and software installations. As with most things, the best teacher is experience and your best guide is informed caution. However, I do hope that the above info can give you a starting point from which you can begin learning the adventures (or misadventures) of troubleshooting your own system. Just remember, when in doubt, backup your files. Even when you're not in doubt, back 'em up anyway...and always keep in mind ways to make a safe recovery from any alterations that might potentially land you into deeper, troubled waters. EQ

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R.J. Joost
via the Internet

A Digidesign has to deal with this question all the time, and here's what they say in their document "Hard Drive Specifications for Session Software for Windows with Audiomedia III":

"Dedicated vs. embedded servo — Dedicated servo is a head-positioning technique that requires a 'dedicated' platter surface and head to position the read/write heads. Servo information is contained on the dedicated platter, which is tracked by the dedicated head. The remaining read/write heads are then slaved to the dedicated head. Dedicated servo drives require thermal calibration cycles to update the head position at regular intervals, which can cause dropouts in the recorded audio or stuttering during playback. When purchasing a dedicated servo drive, we recommend getting a drive with A/V firmware installed. A/V will interrupt the thermal calibration cycle until the drive has completed a command.

"Embedded servo is a head-positioning technique that intersperses servo information between the data tracks on all platter surfaces. The read/write heads transmit the servo information to the drive's electronics, which in turn position the actuator arms so that the heads receive the maximum signal from the servo bursts. Maximum signal occurs only when the heads are directly over the center of the track. The read/write heads constantly receive tracking information, and, therefore, are always aligning themselves. Embedded servo drives do not require thermal recalibration cycles to update head position. The embedded serve technique can be found in most drives on the current market, and is highly recommended for use with Session."

Craig Anderton
Technology Editor
EQ magazine

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EQ LAB REPORT

MANUFACTURER: Voyetra Technologies, 5 Odell Plaza, Yonkers, NY 10701. Tel: 914-966-0600 or 800-233-9377. E-mail: info@voyetra.com; Web: http://www.voyetra.com.

APPLICATION: Integrated MIDI sequencing and digital audio recording/editing for Windows 3.1/95-compatible PCs

SUMMARY: An intuitive, well-designed software package without the extra frills or the extra price tag.

STRENGTHS: Inexpensive; online tutorial; logical layout; scrub feature; good signal processing; no software limit on number of digital audio tracks; 1–4000 levels of undo.

WEAKNESSES: Does not support lyrics in Notation window and printout; no editing in Notation window; does not indicate individual notes being played (only current bar).

MINIMUM SYSTEM REQUIREMENTS: A 486DX/66 with 8 MB RAM (4 MB for MIDI only), although you'll want a higher-performance PC if you work much with digital audio.

PRICE: $159.95 **EQ FREE LIT. #:** 122

BY KEN LEE AND DEBORAH D. K. GERBER

WITH DIGITAL ORCHESTRATOR Plus (DOP), Voyetra demonstrates that purchasing well-designed music software doesn't require winning the lottery — DOP combines over 1000 MIDI sequencing tracks with digital audio multitracking and editing for a street price of around $100.

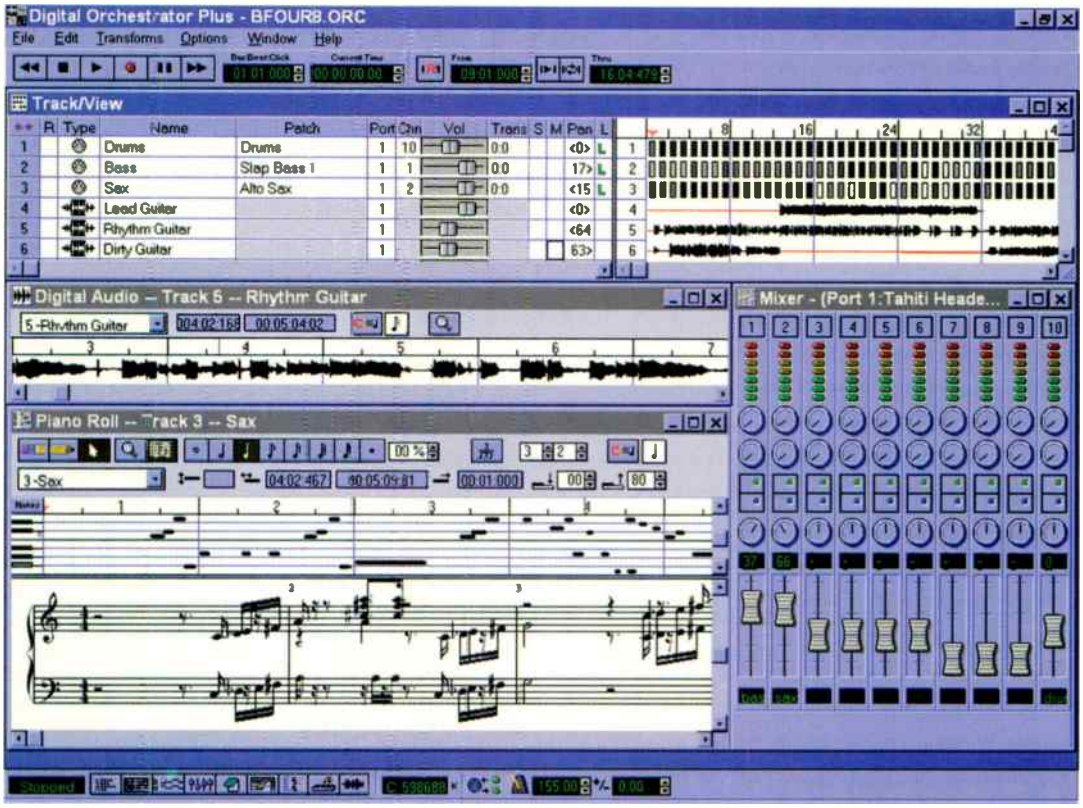
The software can be installed from two 3.5-inch floppies or the companion CD-ROM, which also includes an online tutorial, demo files, sample WAV files, and MIDI drum tracks. Among other new features, the 2.1 release adds SMPTE/MIDI timecode and MIDI Song Position Pointer for synchronization with external devices, Accelerando for changing a song's tempo over time, and Tap Tempo Transform, which aligns beats with free-form material.

INTERFACE

The user interface is well-engineered. The commands are often a single click away, rather than buried in menus or different windows. Right-clicking, control/shift-clicking, and double-clicking are well-implemented throughout the program. Important information and controls are always available, but you can still switch easily between views.

The Transport Control Bar includes the basics: rewind, stop, play, record, pause, and fast forward, along with indicator boxes for current song position values and controls for range playing, recording, and looping. The bottom of the screen contains the Status Bar with tempo controls, MIDI activity indicator, hard-disk space indicator, and Quick Keys (these shortcuts access each of DOP's windows: Track View, Notation, Piano Roll, Mixer, Notepad, Event Editor, Conductor Editor, System Exclusive Bank Editor, and Digital Audio). The Transport Control Bar and Status Bar are always onscreen. The interface is logical enough that we could easily use the main program functions after viewing the CD-ROM tutorial only once.

Track View, DOP's default window,



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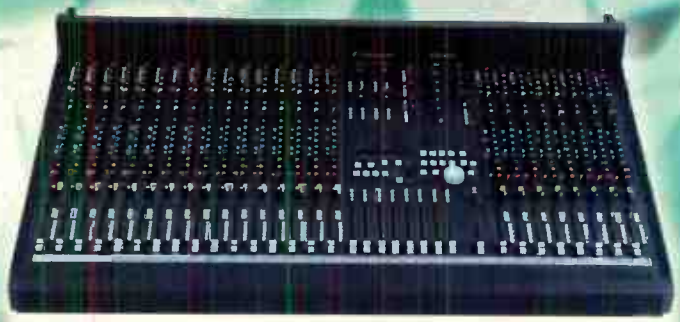

...you wrote the ad.

"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 Hamblyn, Engineer.

"Intuitive handling, flexible routing, great Soundcraft sound." - Melvin Fernandes, Recording Engineer, CMM 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 Saban 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 Lakey (Engineer for PowerStation)

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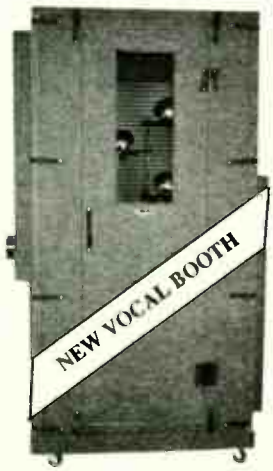

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In many ways, this is a no-frills program that can do almost everything that some of the more expensive packages can do, but for a lot less cash.

offers a macro view of the MIDI sequences and digital audio waveforms in "spreadsheet" format. Each track is a row and each parameter such as Name, Volume, and Patch is a column. Many columns expand/contract with a single click to display more information or additional methods to change parameters. For example, the Volume column displays its value numerically, but turns into a horizontal fader by clicking on the column header. Also, right-clicking a track's Patch column brings up a handy, categorized Patch Selection box for selecting General MIDI sounds. DOP supports multiport interfaces if you need more than 16 channels, and MIDI data editing functions are quite comprehensive.

It's easy to move or copy sections of MIDI and digital audio tracks, or entire tracks, by clicking and dragging; tracks can be looped individually. We preferred to work primarily in the Track View Window, calling up other windows as needed using the Quick Keys, or double-clicking on portions of tracks to work on them in greater detail.

DIGITAL AUDIO

DOP improves on Voyetra's lower level package. MIDI Orchestrator Plus, by letting you record digital audio (mono or stereo) and play it back with the MIDI sequences. The maximum number of audio tracks (recorded as WAV files) ranges from 2 to 20, depending on your system's speed (bus, processor, hard drive, etc.). For example, we typically get seven to nine *stereo* tracks at 44.1 kHz on a P120 w/32 MB RAM; according to Voyetra a P90 can typically do eight mono tracks at 44.1 kHz. Simultaneous record and playback is available if your sound card supports full-duplex operation.

Double-clicking on the digital audio waveforms opens the Digital Audio Window, which lets you zoom in for a closer look and offers more detailed editing options. Effects processing (including delay, chorus, reverb, and compression), as well as fades, crescendos, and other changes in amplitude are available. The DSP did not disappoint, and we were able to create some lush textures with only the digital audio files provided on the CD-ROM. However, there is no time compression/expansion, so if you want to change your sequence's tempo, do so before recording the audio.

The Audition Effect button, a thoughtful addition, plays a small amount of the effect before you commit to transforming all the selected data. An Audition Dry button plays the original track as a reference for comparison. This makes it easy to fine-tune an effect without having to apply an effect and undo it over and over again.

HELP/TECH SUPPORT

The product uses a standard online help system accessed through the menu or F1 key. Resting the cursor over a button or other control activates the One Line feature (changes the DOP title bar to read a description of what the item is or does) and Tool Tips (displays a small box containing the item's name). These can be turned off for more advanced users. Soundcheck, a separate utility, helps troubleshoot hardware and software problems. In addition to phone support during normal business hours (we were

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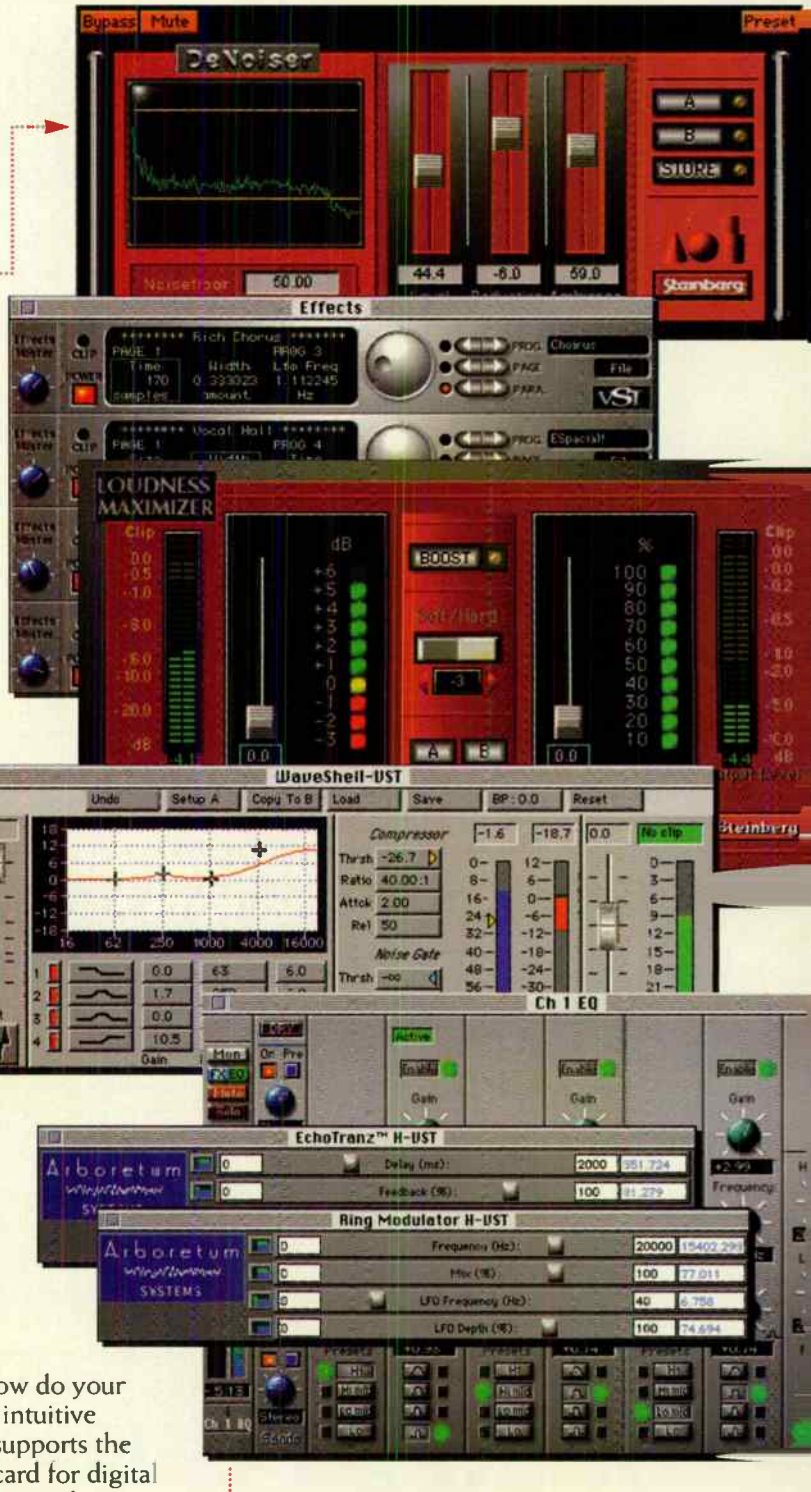

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able to get through with little trouble or delay), Voyetra maintains forums/e-mail support on CompuServe and AOL along with Internet e-mail support, a bulletin board, and fax support.

THE STRAIGHT DOP

While overall this is a solid and cost-effective package, we'd like to see the program support lyrics as part of the Notation Window and printout. Also, editing is not allowed directly in the staffs themselves. Another useful addition would be having individual notes change color on playback (currently there is only a symbol that indicates the current bar being played). We'd also like a Solo button in the Digital Audio Window, as the tracks can only be soloed from the Track View Window.

There are far more things we like about the program. Although nondestructive editing is unavailable, 1–4000 levels of undo are offered for every function (the default undo level is 12), including digital audio editing. Also, you can store multiple takes of a track when experimenting on new edits to avoid destroying previous versions. (Of course, this chews up a little hard-disk space, but we always have ample hard-disk space, right?) The effects processing offers multiple effects, and the levels of controls (and notation output quality) were much better than expected. Best of all, DOP's online video tutorial is a valuable supplement to the well-written manual. It takes you from using the software for the first time to mastering shortcuts that speed up your sessions, and is the next best thing to having someone sit next to you and describe how to use the program's main features.

DOP holds up quite well against its competition. In many ways, this is a no-frills program that can do almost everything that some of the more expensive packages can do, but for a lot less cash. DOP does not have higher-end features such as graphic displays for controller action or velocity (you have to play them in or type them in the Event Editor), nor is there equalization or true automation. However, if you don't consider these essential, DOP may be ideal. With its logical layout, impressive digital audio editing, effects processing, and a fistful of features, DOP is a serious contender for anything remotely close to this price range. EQ

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TO: Chief Engineer
RE: Demo

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Long Live King's X
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Photo by Mitch Gerber/LGI

World Radio History

THE KING'S X OF DRUM SOUNDS

THE BAND'S SOUNDMAN REVEALS THE TRICKS BEHIND GETTING THIS THUNDERING DRUM SOUND ON A BUDGET

BY STEVE LA CERRA

ANYONE WHO HAS ever seen King's X live knows that this trio can rock the roof off just about any venue. With Ty Tabor on guitar, Doug Pinnick on bass and lead vocals, and Jerry Gaskill on drums, King's X is at once melodic, emotional, and powerful. A lot of that power is fueled by Gaskill's drumming, the presentation of which is crucial to the King's X live experience. *EQ* tracked down the band's live sound engineer (and tour manager) Jay Phebus to discuss how he handles Jerry's drum sound.

REALITY CHECK

Jay begins by making it clear that King's X is not the kind of band that has a huge budget for carrying around a lot of gear, let alone their own production. "I really wish we really had our own mics for consistency, but we haven't had the financial success that other bands have had. That puts us at a disadvantage for the console as well. I might have a 'Ferrari' one night and a 'Pinto' the next at front-of-house."

Jay is able to carry some rack gear with him, including ART effects and an ART Phantom console, which he generally uses for effect returns. With two DDL's and three stereo reverbs (one for drums, one for backing vocals, and one for occasional use on Doug's vocal) the Phantom allows Jay to submix the effect returns, feed the submix into two channels or an aux return of the main console, and leave extra channels free on the main board for other uses. "I started doing that when we were coming up through the ranks and did a lot of opening slots for bigger bands. Sometimes the headliner's engineer did their best to accommodate us, and others didn't care. I might have had to deal with getting four channels for the entire band. Having the sub console allows me some consistency and frees up channels." While Phebus formerly used the drum reverb for toms and snare, most recently he is using 'verb on snare only.

START AT THE SOURCE

Of the three band members, Jay acknowledges that Gaskill has the most difficult stage tone to deal with. "Jerry is more of a player and has never been a stickler for tuning. So over a decade of working with the guys I have come across a bit of a technique that I have refined and continue to use with certain mic angles, distances, and positions." When miking the toms, he tries to "keep it to an exact science depending on what mic is available. Typically it's a '421, '57 or an E-V 408. The element is usually going to be 45 degrees off the drum head, approximately two inches away. I'll move it inside the rim just a hair or back toward the edge for picking up more low frequencies. It seems that if you place the mic more towards the rim you get more low frequencies and as you move towards the center of the drum, the low frequencies decrease. It's subtle, but it's something I have worked on over the years and it sticks with me whether it's King's X or Galactic Cowboys."

This past year, while making the most recent King's X record, *Ear Candy*, Phebus accompanied the band on a mission to find a great kick drum. After trying about two dozen different drums, they eventually found a Pearl kit with a killer kick drum that they felt was amazing. Reproducing the kick drum tones from *Ear Candy* on stage, however, proved to be a bit more difficult. "Due to the fact that we don't have our own microphones, I will vary the kick drum miking technique rather drastically. If it's a mic known for low frequencies, like an E-V RE20 or PL20, or an AKG D112, I'll use a technique where you put three fingers against the in-

BANDING TOGETHER: King's X has developed a loyal following for their rocking sound. Doug Pinnick is shown here.

Photos by Mitch Gerber/LGI

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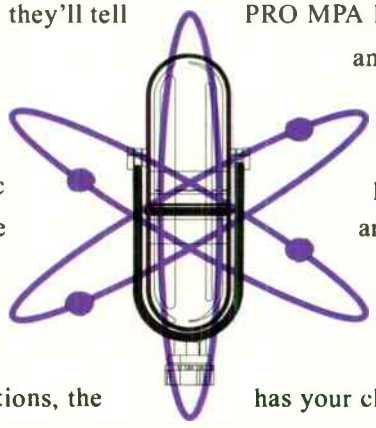

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side of the drum head directly in front of the where the beater hits. Then put the front of the mic close to the drum head with your three fingers in between. My safety valve is a Shure SM58. I know that almost anywhere we are playing there will be at least one of those. I can place it inside the hole in the front head at about a 45-degree angle to the beater, but I won't get close like I will with one of those other mics. The part of the '58 where the cable connects is far into the front "corner" of the drum — even though there really is no corner."

Jay's logic behind this is that a large-diaphragm mic will pick up less attack, and so should be closer to the "smack" of the beater, whereas a mic such as a '58 (or any vocal-type mic) will capture the attack more effectively due to the smaller diaphragm size. Jay notes, "A lot of engineers will put a low-frequency mic at the front of the hole or at an inch inside the hole, and that works when you want a less articulate sound — more of a boomy, resonating low end. With the style that King's X is playing, if I do that it's virtually impossible for me to get the attack. I'll have to crank the EQ on the board to like +15 just to get some of the attack."

For the first weeks of the *Ear Candy* tour, Phebus was using a different kick drum technique because the front head was closed. He'd use a large-diaphragm mic in front of the drum and then a vocal mic such as a '57 or '58, or a Beyer M88 next to Gaskill's foot. "I desperately tried to get the kick sound from *Ear Candy* live. But in the studio we had the luxury of time, a lot of expensive mics, and (especially) isolation. As good as that drum sounded acoustically, once the stage volume kicked in there was no way for me to capture it. As soon as I got the attack from the beater side I would also get a lot of snare bottom and sometimes foot pedal squeak. So we bought a bunch of Remo Powerstroke 3 heads and cut a hole in one. That head has an extra ring around the inside edge and we used it on both sides of the drum with nothing inside. If we were on a big tour, we could have used a Plexiglas shield to get some isolation and we might have been able to reproduce it. I was really trying to give the audience the sound from the record, but we had to go with what we knew would be consistent under the circumstances."

The hole in the front head was cut off-center (about six inches in diameter) for two reasons. First it is easier to place certain mic stands along side of (as opposed to in front of) the kick drum. And, second, when the hole is cut off-center, the drum behaves more like it has both heads on it. Cutting a hole in the center reduces the reflections and resonance from the front head. Phebus gates the kick drum very tightly so that he can tweak the gain on that channel up as high as possible, making that drum sound pow-

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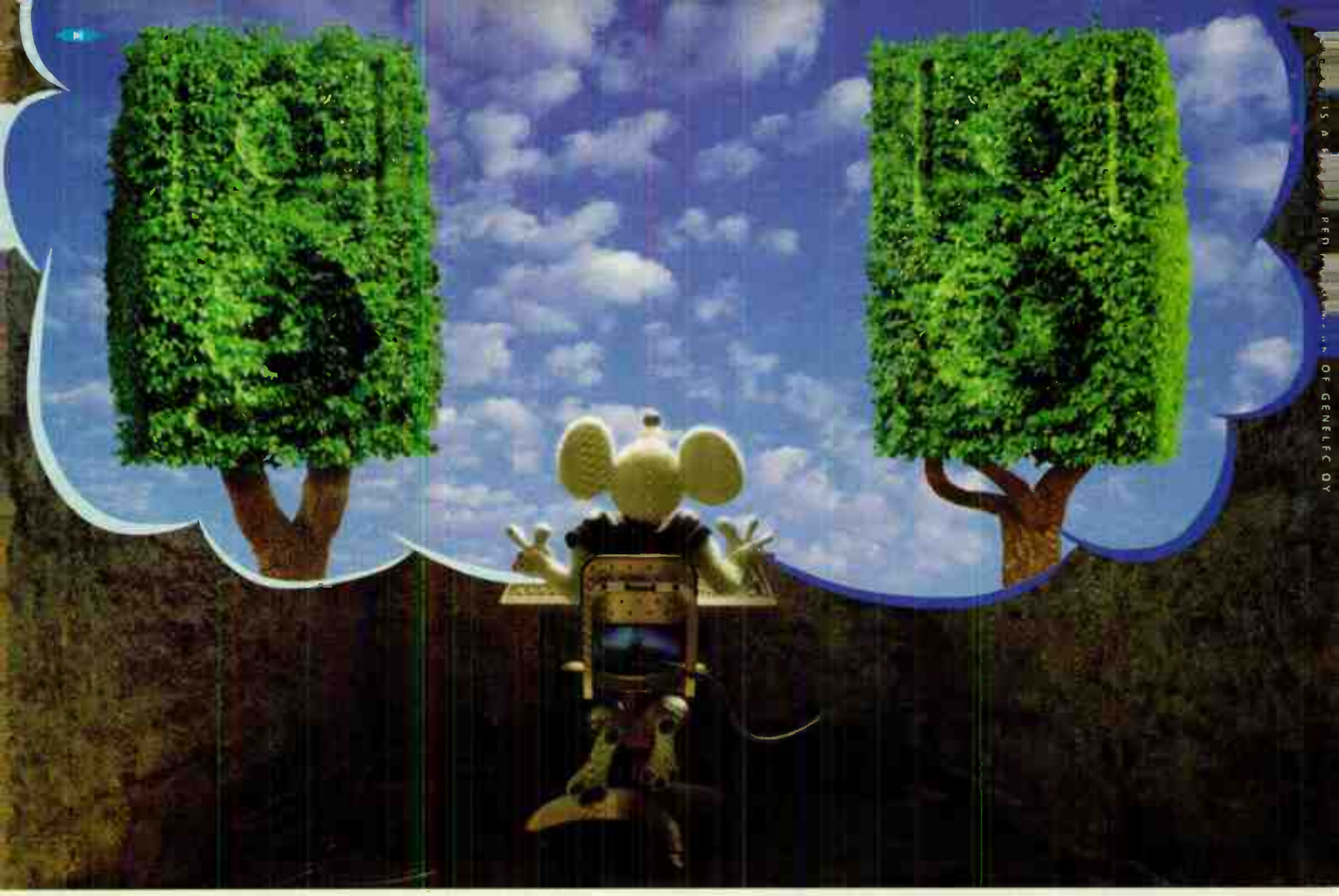

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erful without letting it run away.

When it comes to snare drum, Jay mics the top and the bottom of the drum. Since a lot of clubs have consoles without phase reverse switches, Phebus tries to overcome the inherent phase problems of multimiking a snare with mic positioning. "I'll mic the bottom with a '57 placed at a 90-degree angle to the top mic. If you try this type of angle it will help reduce tremendously, if not eliminate, the phase cancellation. They nearly have to be at exactly that angle and that is in relation to each other and not the drum. The top mic I always place in the traditional spot: right inside the rim. That angle will vary — if I need more attack I'll drop down and make it more flat, whereas if I want more beef, I'll come back toward the rim a little and raise the back end of the mic for a sharper angle to the head. I'll set the top mic first and then put the bottom mic at 90 degrees to the top mic. Sometimes the bottom mic is perpendicular to the snares." The amount of bottom mic used in the mix varies depending on room acoustics; brighter rooms usually require less of the bottom mic.

Jay's mic placement for the overhead mics can look a bit odd. The overhead mic on the hihat side is placed about a foot over the crash cymbals, angled towards the center and the front of the kit. Then the other side of the kit gets a mic pointed almost directly at the bell of the ride cymbal. "It isolates the ride cymbal so that I can pick out any of the tasteful cymbal work Jerry might do, and he hits the crashes so hard they bleed through" (when mixing sound for Galactic Cowboys, Jay has miked the ride cymbal from underneath just to keep the mic out of harm's way). He continues, "The height and texture of the ceiling has a tremendous effect on the sound of the kit. With a hard, low ceiling it is a nightmare, especially with Jerry singing because everything gets washed straight back down into the vocal mic." Overhead mics are high-passed to reduce rumblings and wind noise from Gaskill's on stage fan.

Miking the drummer's backing vocal parts also proved to be difficult due to the band's loud stage volume. "They play so loud and aggressively that one of my big problems is Jerry's vocal in the mix. He sang better on this tour than ever before because Doug got on him to eat the mic. We tried every mic in existence and the best has been the Sennheiser MD409. It's flat, so it is real comfortable to get right in your face, and when you get up close, the isolation is better than if the mic had a round head. Also the cable and connector is out of his way. The boom comes in from his left and the cable goes straight down the boom."

To hear these techniques in action, listen for the King's X drum sound at a club near you.

Jay Phebus is an independent engineer/tour manager who has been working with King's X and Galactic Cowboys. He can be reached at KX MX h2o@aol.com or 76702.3430@compuserve.com.

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Near-Field Monitors

Critics agree... *the YSM-1 monitor is a real contender. But the excerpts below only tell part of the story. Let your own ears be the judge... and then buy yourself a new toy with the money you save!*

- *"...I was immediately impressed with the deep bass response."*
- *"...Rock solid cabinet, internal brace and ample internal dampening material ...no audible unwanted bass resonances.*
- *"...a much bigger sound (than the industry-standard Yamaha NS-10 nearfields), with dramatically deeper bass response and a more 'open' top end."*
- *"...quite detailed, allowing you to pick specific elements out of dense mix."*
- *"...I would encourage all nearfield buyers, regardless of price point, to listen to these monitors."*

Pro Audio Review
Lorin Alldrin, Sept/96

- *"It was a pleasure mixing on the YSM-1s, and the resultant mixes translated exceptionally well to other playback systems...ear fatigue was nonexistent."*
- *"...The YSM-1 reproduces timbres with near pinpoint accuracy."*
- *"The YSM-1 is a full-bodied, sonically neutral monitor that, to my ears wins the prize for delivering the most realistic picture of the aural spectrum."*
- *"...Mids and high mids were clean and articulate."*
- *"Stereo imaging is very good, resolution is consistent in every frequency range"*

Electronic Musician
Brian Knave, July/96

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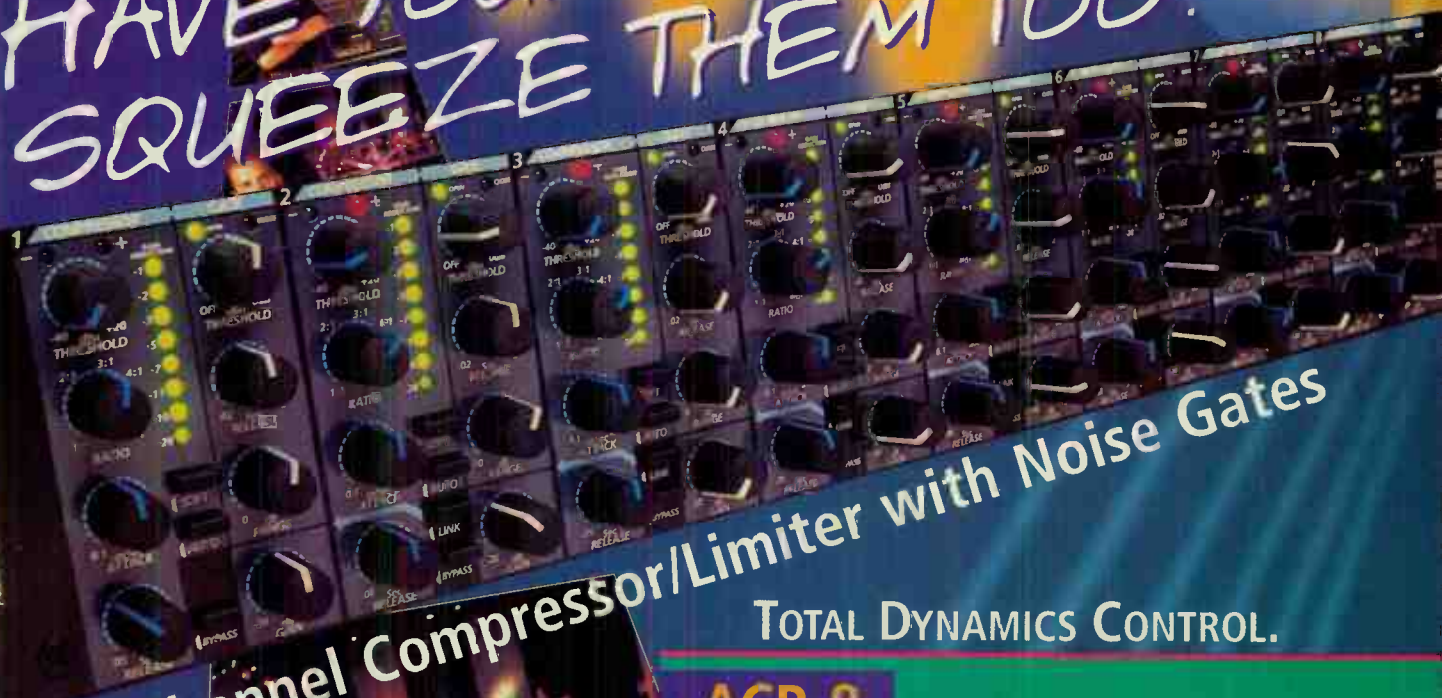
CIRCLE 97 ON FREE INFO CARD

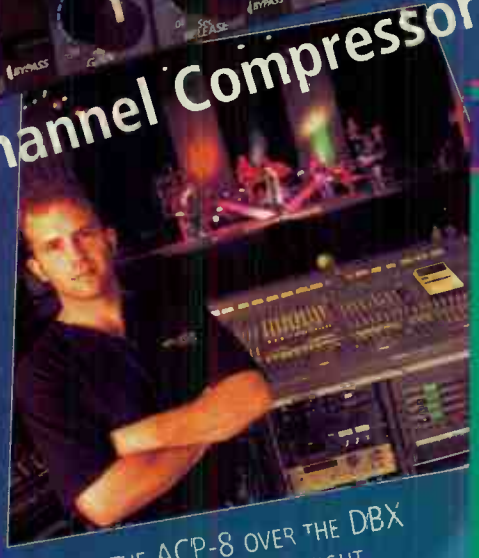
World Radio History

HAVE YOUR GATES AND SQUEEZE THEM TOO!



PreSonus Audio Electronics

Eight Channel Compressor/Limiter with Noise Gates



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STEVE MACKEY,
CLAIR BROTHERS' ENGINEER
ON TOUR WITH JARS OF CLAY

Professional Users Group:

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MICK CONLEY
KNOW MATTER

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KEVIN MARSHALL:
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SPECTRUM SOUND:
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ACP-8

The ACP-8 can replace up to eight compressors and eight noise gates.

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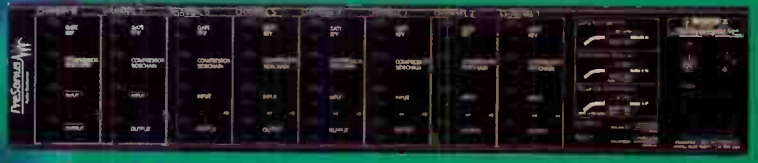

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CIRCLE 54 ON FREE INFO CARD

World Radio History

New Gear for Your Next Gig

High IQ

Crown has made two new additions to the IQ line: the SLM-8 Impedance and Frequency Monitoring Processor and a new Pocket Serial Interface. Both products are designed to improve the flexibility and reliability of Crown IQ System's performance. Due to its stored onboard distributed intelligence, the SLM-8 has the capability to operate as a stand-alone unit or as part of the total computer system configuration. The SLM-8 nonvolatile memory location retains its integrity in the event of a computer system failure or software corruption. The SLM-8 monitors both impedance and frequency response by performing an initial sweep to obtain a reference evaluation of performance. This information is stored in an onboard EEprom in the form of a data curve. The front panel displays 16 bicolored LEDs to indicate a pass/fail status on all eight channels of impedance and frequency response information, as well as data and power indicators. The Crown IQ Pocket Serial Interface (PSI) allows users to execute remote functions from a Crown IQ System. Operating on a single 9-volt VDC battery or external AC adapter, this pocket-sized unit contains an RS-232 input and a Crown Bus data loop port. The PSI provide the user with a portable IQ interface control allowing the connection of a single Crown Bus to a host computer via the IQ System loop. The host computer can now be used to select components on the Crown IQ Bus, retrieve data and execute commands. It provides removable barrier blocks for both the Crown Bus port, aux port and a 9-pin male RS-232 connection on the attached RS-232 cable. In addition, the PSI can serve as a standalone IQ aux port with its own IQ address. The unit determines which function it performs by sensing the presence of an RS-232 connection. For more information, contact Crown, 1718 Mishawaka Road, Elkhart, IN 46517. Tel: 219-294-8066. Circle EQ free lit. #123.

Crown SLM-8

Wish on a Star

Telex has introduced the new VHF and UHF ProStar Series wireless microphone systems. Both units have been designed in a half-rack-space plastic case. A new rack tray is available that accommodates two units. The UHF unit is available in gray while the VHF version is offered in black; both systems are offered in a lapel and a handheld version. The handheld versions offer the choice of a condenser or a dynamic microphone. Both systems also come optimized for guitar applications with specially tuned circuitry that enhances the frequency response and attack characteristics of the guitar. The UHF system occupies the 690 to 725 RF carrier frequency range with a frequency range of 50 to 15,000 Hz. Frequency stability measures .005 percent with an unweighted signal-to-noise ratio of 91 dB with less than 0.5 percent total harmonic distortion. The VHF system occupies the 174 to 186 RF carrier frequency range and offer a frequency response of 50 to 15,000 Hz. Frequency stability measures at .005 percent with an unweighted signal-to-noise ratio of 85 dB with less than 0.5 percent total harmonic distortion. Systems are available in eight different stock frequencies and frequency coordination assistance is always available from Telex. For more information, contact Telex, 9600 Aldrich Ave. South, Minneapolis, MN 55420. Tel: 612-887-5550. Circle EQ free lit. #124

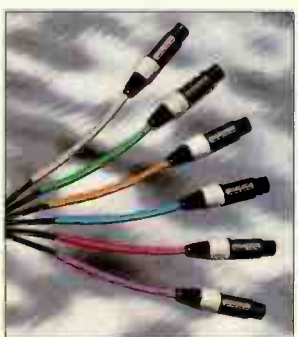
Martin Audio ICT-500

Oh Martin

The ICT 500 from Martin Audio is a compact, full-range speaker featuring two forward-facing 10-inch ICT drivers plus two internally mounted, long excursion, high-powered 10-inch low-frequency drivers. The ICT technology uses a magnetic field generated by the low-frequency driver's voice coil to inductively drive an aluminum high-frequency diaphragm located at the center of the unit and horn loaded by a phase plug and waveguide. Due to the fact the HF is energized by induction, there is no voice coil, eliminating the most common field failure in this type of system: tweeter voice coil burnout. The ICT is a point source device. The M2 is an advanced Martin system controller designed to control full-range ICT500 systems. For more information, contact Martin Audio, distributed by TGI North America, 300 Gage Ave., #1, Kitchener, ON Canada N2M 2C8. Tel: 519-745-1158. Circle EQ free lit. #125.

Snakey Feeling

Whirlwind's new Snakeskin fanout sleeving makes thin snake fanouts virtually indestructible. Snakeskin is a color-coded monofilament polyethylene terephthalate braid that is humidity-, solvent-, and flame-resistant to military specifications. It can be submerged 30 days in salt water, hydraulic fluid, gasoline, or hydrocarbon solvents with no significant loss of its strength or flexibility. Snakeskin is ideal for outdoor applications because it does not degrade from UV exposure. For more information, contact Whirlwind, 99 Ling Rd.,


Whirlwind Snakes

World Radio History

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World Radio History

SKB 1615

Rochester, NY 14612. Tel: 716-663-8820. Circle EQ free lit. #126.

Case Closed

SKB has introduced the 1615, the world's first universal mini mixer case. The case provides a snug fit for all smaller mini mixers like the Mackie and Samson portable mixers. The SKB-1615 meets ATA-300 Cat 1 specs as an airline shipping container. A heavy-duty polyethylene diced-foam interior can be picked and pulled to provide a custom fit. The heavy-duty military-style exterior features ribs and bumpers that protect the case's lockable hardware and absorbs shock. The 1615 is also lightweight and stackable with a gasketed valence system to keep damaging elements out. Retail price is $159.95. For more information, contact SKB, 1580 North Batavia, Suite 1, Orange, CA 92667. Tel: 714-283-8118. Circle EQ free lit. #127.

Add an S

Three new models have been added to Electro-Voice's popular S Series of speakers: the S12, S15, and S18. The S12 12-inch, two-way system and S15 15-inch, two-way system offers high-Q, 60- x 40-degree horn for increased coverage. The S18 is an 18-inch subwoofer. All of the new models feature American-made Electro-Voice components and E-V's RoadWood cabinet material, which is twice as strong and half the weight of particle board. For more details, contact Electro-Voice, 600 Cecil Street, Buchanan, MI 49107. Tel: 800-234-6831. Circle EQ free lit. #128.

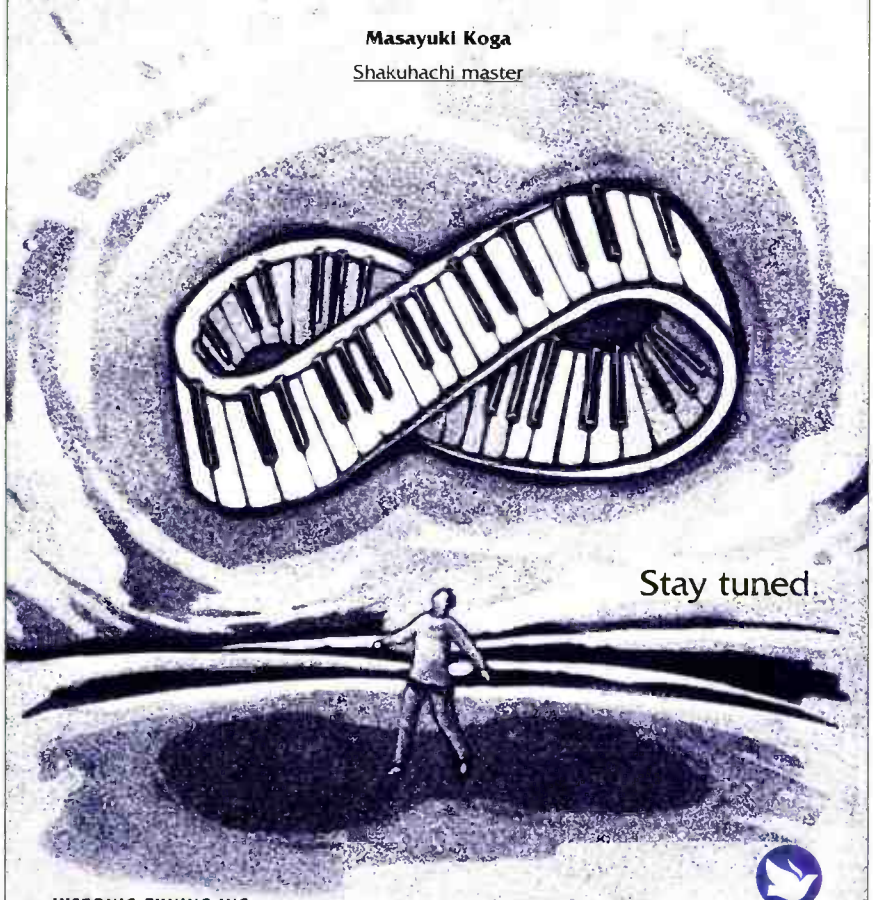
Electro-Voice S Series

Feeling Powerful

Crest's new 3U CA18 power amp has been designed for DJs requesting a high-power supply for their 1000 W @ 8-ohm speaker cabinets. The CA18 has a power rating of 1800 W @ 4 ohms and 2500 W @ 2 ohms. Taking their technological cues from Crest's Professional Series, all CA Series amplifiers feature TourClass protection circuitry, toroidal power transformers, and Crest's "overbuilt" power supply. For more information, contact Crest, 100 Eisenhower Drive, Paramus, NJ 07652. Tel: 201-909-8700. Circle EQ free lit. #129. EQ

"The wonderousness of the human mind is too great to be transferred into music only by 7 or 12 elements of tone steps in one octave. There are millions of steps of microtones, and none is to be thrown away, just like nothing is to be wasted in this world."

Masayuki Koga
Shakuhachi master



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World Radio History

The Power of Vision

"Studiomaster has definitely come into the fray with a hard-hitting piece of equipment." - *Tim Oliver*
Future Music Magazine - U.K.

"A superbly thought out mixer- amp. Highly recommended."
- Zenon Shoepe,
EQ Magazine

"Yes, I am impressed by the VISION consoles. If this is the way integrated PA desks are heading in the future, then I'm coming along for the ride."
- Ian Masterson, The Mix - U.K Magazine

Then...

Back in 1981, Studiomaster launched the 82 Mosfet stereo powered mixer. The design of the 82 Mosfet was extremely advanced for its time, providing cutting-edge features such as: three powerful independent mosfet amplifiers, (two for main and one for stage monitors), assignable stereo graphic equalizers and warm British equalization (often copied but never equalled)!

...and now!

The most advanced stereo powered mixer ever produced ...a feature packed, 'all in one' design, with better audio specifications and reliability than most of today's component systems.

SERIOUS POWER + SERIOUS PROTECTION

Unlike other cheaper powered mixer designs, we have incorporated one of our ultra high specification power amps, which delivers a robust 350 watts per side into a 4 ohm load. The amplifier section also employs Studiomaster's exclusive **AMCS™** *Amplifier Management Control System*, allowing for the best possible performance even under the most demanding operating conditions. The AMCS system provides: SIGNAL LIMITING (making it virtually impossible to overdrive the amplifier), THERMAL & LOAD SENSING FAN COOLING, ELECTRONICALLY GATED POWER STAGE and CROW BAR SPEAKER PROTECTION.

- 8, 12 and 16 channel versions
- 350 watts per side (700 watts total)
- 3 band EQ w/mid sweep
- 82 program stereo digital effects processor with MIDI control
- Stereo sub-group (doubles as channel mute switch)
- 2 x 7 band graphic equalizers
- Programmable footswitch
- Built-in electronic 'HELP' program
- Main/monitor amp 'split' feature
- 48v phantom power

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CIRCLE 81 ON FREE INFO CARD

World Radio History

House Of Blues Chicago

Club Profile: Chi Town Gets Its First "Juke Joint/Opera House"

By Steve La Cerra

PHANTOM POWERED?: The House Of Blues takes up residence in an old opera house.

"OVER THE TOP" is a term that could be favorably used in general to describe the string of House Of Blues clubs across the United States. Now, House Of Blues has a new home in Chicago and to say that this HOB is "over the top" might be akin to saying that there's fish in the ocean. The site upon which the new 1500-person capacity venue sits was built back in the early 1960s as part of a development project called Marina City. Intended to be a cinema at that time, the building is clad in lead and looks sort of like a big whale (movie fanatics might recognize this complex from the famous automobile chase scene in the movie *The Bounty Hunter*). Marina City, and the building (which had never seen significant use in its lifetime) fell into disrepair. Because it is classified as a landmark, House Of Blues was not allowed to make any structural alterations but was able to come up with a very interesting concept.

A NIGHT AT THE OPERA

House Of Blues founder and visionary Isaac Tigrett had an idea to create an opera house similar to the ones created at the turn of the century. But remember that House Of Blues typically have a "juke joint" vibe. His thought here was to have a "juke joint/opera house" vibe (in light of the fact that blues is the original American opera form), and the creators of House Of Blues have amazingly enough achieved that effect.

A modern opera house was built within the original structure, almost like a big stage set — complete with ornate plaster work (painted with 24-karat gold leaf paint) and three levels of private boxes (16 total) with their own corridors, doors, and audio/video systems, as well as Internet access. Structurally speaking, the roof of the outer building serves as the roof to the opera house. According to John Lyons of the Lyons Group nightclub consortium and Moonlighting, Boston, MA (who supplied the gear and acted as sound and lighting consultant on the project), "That roof (which is roughly 65 feet high) was sprayed with three inches of K13, a cellulose sound absorption/insulation that deadened the reflections off the ceiling. Visually you cannot see this ceiling because it's black and the area below it is so intensely colorful and well-lit." In addition to Lyons, the HOB in-house production team of Don Sidney and Aron Levine also played key roles in the project.

For a venue of this size, the stage is huge — 35 feet deep and 45 feet wide and even the stage is over the top. Lyons relates, "In certain settings, when we didn't have a full house, the stage would need to be living at 3.5 to 4 feet off the ground. When it's a full-blown show with a packed house and all three balconies are open, it would need to live at about 5.5 to 6 feet off the ground. So the entire stage was built as a steel structure upon hydraulic elevators. It travels from a low point of two feet to a high point of eight feet. We bring the stage down to two feet and the elevator from the loading dock brings equipment right up to the stage. We can roll

BLUES MEN: Engineers Chris Bailey and John McLaughlin at FOH.

Photo by Paul Natkin/Photo Reserve, Inc.

World Radio History

Gimme a...

Compressor

The compressor in the 286A is a patented hybrid feed-forward/feed-back design that was engineered by a guy named Bob Orban. (His stuff is used on almost every radio station on the face of the planet). Using the classic dbx VCA (the heart and soul of a compressor) the 286A compressor is very easy to use with its drive and density controls. Drive is the amount of signal sent into the compressor and the Density is a combination of controls that allow you to achieve anything from a nice transparent gain reduction all the way to a fat squashy compression so popular on heavy rock vocals. The 8 stage LED meter gives you a great visual indication of how much the compressor is working on your vocals or whatever else you may run through your 286A. Now's actually a good time to tell you that you're not stuck just using the 286A as a mic pre, it's got a line input so you can use the 286A's 5 processors on any of your audio: guitars, keyboards, drums - anything!

Expander/Gate

Background noise in the room, sound leakage from headphones, vocalist breathing etc. are all problems that can crop up while recording your vocals. These situations are all easily taken care of with the 286A's Expander/Gate. This multi-use design allows you to gate out any noise during breaks in the intended signal and when used as an expander, will push down any unwanted noise in the signal such as headphone bleed.

Enhancer

Another very cool device in the 286A is the Enhancer. The low frequency detail is a very trick circuit that not only adds warm low end but fattens up the signal by cutting out some of the mud in the lower mid-band at the same time! The HF (high frequency) detail adds sparkle to your signal. Now if you're thinking that the sparkle that you add with the Enhancer is going to put back the high frequency sibilance the de-esser is taking out, think again. The two circuits are tied together in an ingenious (and patented) way such that they work in tandem to do both jobs beautifully!

De-esser

One of the biggest problems with processing vocals are those pesky "ssssss" sounds. Our dbx de-essers are in use in virtually every major recording studio in the world. The 286A's de-esser (yet another patented dbx circuit) gives you a frequency control so you can pick out exactly the range where the de-esser will do its thing and a threshold control so you can control the amount of de-essing that will occur. Because of the unique design of this circuit the de-esser monitors the amount of signal coming in and adjusts itself you don't have to constantly change the settings for different volume levels.

This unit is fully balanced for clean connections, has an internal power supply for reliable power without the wall wart, and knobs that click at each setting for accurately reproducible settings.

Oh... and a GREAT Mic Pre

The 286A utilizes a precision laser trimmed ultra low noise (0.95 nV /√Hz) circuit that translates to an Equivalent Input Noise spec of -128dBu and an extremely wide bandwidth of >200kHz. All this engineering jargon translates to a gorgeous mic pre-amp circuit that you can count on to sound warm, transparent and accurate. With a precise 48 volt phantom power supply built in, you can count on the 286A to work with all your professional standard microphones.

and I want it all in one box!

Better, faster, more, now - in one rack space. I want a Mic Pre to warm my vocals up, a Compressor to keep 'em tight, an Expander/Gate to keep 'em clean, an Enhancer to make 'em shine and a De-Esser to keep 'em natural.

And if I want, let me use the processors for my other gear and I want it all in one box... You got it. The dbx 286A gives you the flexibility and control you need to make your vocal tracks sizzle and your other tracks shine. Visit your local dbx dealer today for a test drive of all the processors in the dbx 286A or call us for more information.

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CIRCLE 30 ON FREE INFO CARD

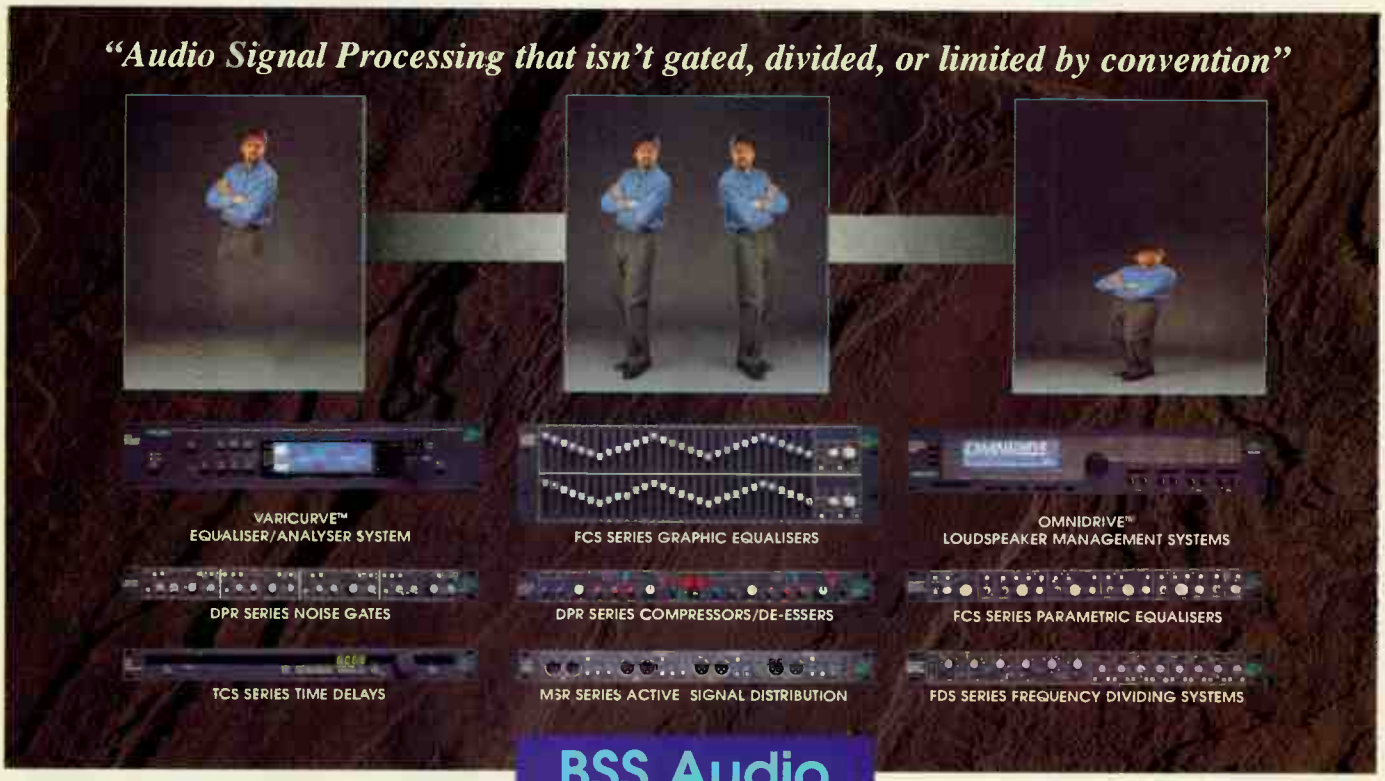
HAVE YOU HEARD?: Monitorland uses a Crest Century board.

cases right onto the stage and then raise it up to wherever we want. Lifting road cases and all that nonsense is not an issue."

Above the stage is a full proscenium from which all of the sound and lighting trusses are hung — as if the house PA system was a touring rig. This allows the house PA to be lowered and disassembled in the rare event that a visiting band wants to bring in their own stacks. But that's not likely, considering the speaker array that Lyons has installed in the room. JBL 4894 high power dual 14-inch cabinets are flown two per side and focused on the floor area while JBL Control 8's are used to cover the two under-balcony delays in two additional "zones." At the middle level are two JBL 4892 compact single 14-inch cabinets per side and again at the upper level are another two JBL 4892 compact single 14's per side. Low-end power comes from four JBL MPX1200's while the midranges are powered by six JBL MPX1200's and the high-frequency horns are powered by four JBL 6670's.

Each of these cabinets covers a specific area. If you were facing the stage from the center of the room, you'd see a stack over each side of the stage. Each stack has outside speakers focused towards the balconies and inside speakers focused towards the center of the room. One interesting problem that came up in the design of the system was that the cabinets nearest the balconies needed to be driven differently from the cabinets aimed more towards the center of the room. Due to physical proximity, the outside cabinets (i.e., the ones closest to the balconies) cannot be as loud as the inside cabinets, or listeners in the balconies would get blown out. Lyons' solution was to treat the PA as an outside/inside situation as well as a left/right situation.

"The outside cabinets receive a different gain structure; the inside ones get a higher gain and those closest to the balcony get a lowered gain so that you are not killing the people sitting in the balcony. The outside cabinets are crossed over just a bit differently because the VIP booths create a sort of acoustic trap. We have also installed speakers inside the booth with their own independent volume control, and those are receiving a delayed signal so that



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World Radio History

Focus on the Details

Like precise visual images you get from a high quality professional camera and large lens, the CAD E-300 produces unparalleled aural imaging of the audio environment.

A unique combination of CAD's exclusive Equitek Servoed head amplifier and a classically designed large capsule provides...

- Precise Signal Reproduction
- Extraordinary Ballistic Integrity
- Extended Low -end Response
- Unmatched Transparency

The E-300 Servo-Condenser Microphone from CAD
'A Revolution In Resolution'

- 1.1" gold sputtered dual diaphragm externally biased capsule
- Multi-pattern-cardoid, omni, figure 8
- 20dB non-capacitive pad
- Internal stainless steel EMI / pop filter
- Ni-Cad supported power supply delivering unmatched ballistic stability & allowing remote operation without phantom power.
- Available in matched pairs

E-300 Shown with optional ZM-1 Shock Mount

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• CAD, a division of CTI Audio, Inc. • P.O. Box 120 • Conneaut, OH • 44030 • 800-762-9266 •

CIRCLE 18 ON FREE INFO CARD

World Radio History

they are time-aligned with the fly." BSS Omnidrives are used to handle time alignment, crossover, parametric EQ and gain control for the flying cabinets. Of the Omnidrive's eight outputs, six are used to triamp the part of the system that covers the floor area (three left, three right). Then the remaining two outputs are used to feed a JBL ASC24 that handles crossover functions for the inside/outside balcony speakers, which are biamped. Sitting on the floor of the room are JBL CD10171 subwoofer boxes with two 18's in each cabinet for a total of four 18's per side (all of this is completely independent of the dance system). On top of the proscenium, where there is a musician's bar/hang-out area, is another set of subbass speakers to fill in the low end for the upper parts of the building.

HOUSE OF THE CENTURY

For both house and monitor mixing consoles, House Of Blues decided to use 52-channel Crest Century Vx's. Front-of-house is loaded with a selection of rack toys that should make any visiting engineer happy. In addition to a Lexicon PCM 90 and Yamaha SPX990, there is an assortment of compressors and gates including dbx 1066's and 166's, as well as BSS DPR-404's and 504's. A Klark-Teknik DN3600 digital 1/3-octave EQ is available for visiting engineers to tweak the system to taste. Limiting on the house feed is done in the Omnidrive, but since the Omnidrives are living near the stage area there is also a BSS DPR-404 compressor at the FOH position for compression as well.

Monitorland is equally well-equipped; twelve mixes are available on eight biamped JBL 4890 wedges, four biamped JBL 4891 wedges, a pair of JBL SR4726a over 4715's side fills, and an AS1015 with a SR4726a box for the drum fill. The wedges are biamped with Crest 7301's and the other boxes are powered by JBL MPX 1200's and 6670's. Monitor EQ is via six BSS FCS960 dual 1/3-octave, stereo 31-band EQs, with one side per mix. These sit in a rack next to the monitor console as do an assortment of BSS DPR-504's and DPR-404's for the monitor rig. The club also has a full complement of both Shure and AKG microphones.

Lyons notes, "We have enough of a selection so that if you have a particular preference of one kind over the other, you can have your preference. A lot of bands typically tour with monitors but I think that if they show up and see a really nice monitor rig, then they'll leave their stuff in the truck — because we have as good or better. The philosophy is the same as that of the entire House Of Blues: exceed their expectations."

continued on page 126

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LA AUDIO 4X4² NOISE GATE/COMPRESSOR

FILTERS HAVE BECOME a desirable feature in noise gates, but only a few compressors include this powerful tool for fine-tuning the behavior of the dynamic processor. After you have experienced using a noise gate to trigger only on the low frequencies, such as when removing cymbal leakage from a rack tom mic, then you can never go back. A compressor that can be frequency selective can offer practical solutions to improving your sound. This includes the capability to compress only low frequencies while leaving the high end untouched to fix a muddy-sounding live vocal or only trigger on high frequencies to reduce sibilance. A world of dynamic equalization unfolds when you use a noise gate or compressor that includes filtering in the audio and/or sidechains. The new LA Audio 4X4² includes filtering in a comprehensive package of good-sounding gates and compressors.

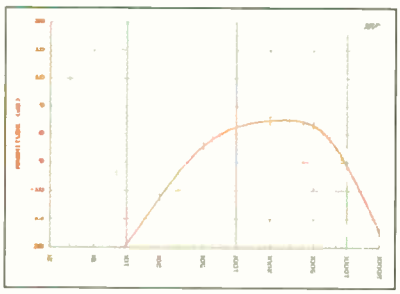

FIGURE 1: Noise Gate filter response with the two controls set to approximately 3 o'clock: high-pass filter @ 1 kHz and the low-pass filter @ 5 kHz. Filters can be used to select which the frequency spectrum that will open the noise gate (Key), be expanded (SNR), or as an outboard EQ (Ext).

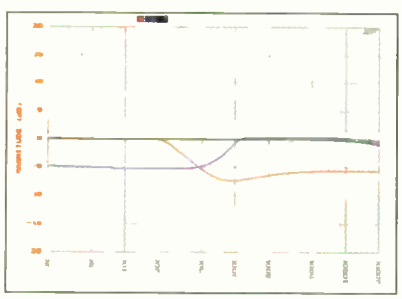

FIGURE 2: Compressor filter in Normal mode. The graph displays the response of the filter set to 1 kHz and 6 dB of compression. The blue line is the Low mode and the red line displays the Hi mode response. In this mode, the overall signal level is reduced when a signal within the frequency band of the filter exceeds the compression threshold.

The LA Audio 4X4 has been substantially improved since its original introduction a few years ago. I reviewed the first iteration of this British-made unit in the March 1994 issue of *EQ*. Since then the 4X4 has been extensively reworked by SCV Electronics of London and each of my criticisms of the original has been addressed. The result is a much more flexible unit that is easy to operate and loses none of its capabilities in any operating mode. I miss the color-coded knobs on the front panel of the original units, but the layout follows a logical flow that makes the 20 knobs and 23 switches reasonably easy to keep track of. The new version retains the smooth-sounding FET-based VCA of the original.

The single-rack-space unit sports a two-tone grey front panel. (Low-light operation could be improved with greater contrast between the legends and the panel color.) There are LED indicators for: Gate Open (green); Compressor Gain Reduction (8 red LEDs); Bypass (red); Stereo mode (yellow); and Power On (green). When the compressor is bypassed, the LEDs are dimmed but still indicate the potential amount of gain reduction. A handy feature when setting up the unit on the fly.

Each of the two noise gates includes rotary controls for: Threshold (–60 dB to +20 dB); Range (0 dB to –60 dB); Release (5 ms to 4 seconds); High Pass (25 Hz to 3 kHz); and Low Pass (250 Hz to 30 kHz). The switches alternate to select: Bypass; Auto or Fast Attack time; Internal or External Key input; Key Listen mode; SNR (selective or single-ended noise reduction) mode; and Internal or External filters. The attack time is click-free. The Fast attack setting works well with transient signals such as percussion while the Auto attack time setting will handle just about everything else. The Key listen mode places the filters into the audio chain (see fig. 1) to allow you to set the gate's frequency settings by ear. The SNR mode places the gate filters in the audio path, which attenuates frequencies outside of the filter settings when the audio

ROAD TEST

MANUFACTURER: SCV London, 6-24 Southgate Road, London, N1 3JJ, UK. Tel: 44 (171) 923-1892. Exclusive North American distributor: Audionova, Inc., 2083 Chartier Avenue, Dorval, Quebec, H9P 1H3, Canada. Tel: 888-247-8580.

APPLICATIONS: Dynamic processing in studio and live applications, especially where increased frequency selectivity or dynamic equalization is desired.

SUMMARY: An easy to use gate/compressor package that provides frequency-conscious gating and compression of up to four channels of audio.

STRENGTHS: Flexible architecture allows a range of operating modes from four independent channels of processing to a stereo gated compressor; easy to set filters enhance selectivity of processing and can be used independently of dynamics processing.

WEAKNESSES: Switch designations may require reference to operation manual; minimal LED indication of thresholds/gate attenuation.

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drops below threshold. This can be used to reduce rumble and/or hiss without killing the quieter passages from the instrument or ambience from a microphone. The filters can also be patched to external sources as a process independent of the noise gate. These functions offer a very large range of applications with little compromise in control or sound quality.

The two soft-knee compressors include five knobs for control of: Threshold (–40 dB to +20 dB); Ratio (1:1 to 20:1); Release (40 ms to 2 seconds); Filter (100 Hz to 10 kHz); and Gain (–6 dB to +20 dB). The pushbutton switches select: Bypass; Input (rear panel or Gate output); Attack (slow = 20 milliseconds or fast = 400 microseconds); Pass (filter in high-pass or low-pass mode); and Mode (Normal or Half). Most of these controls are familiar to anyone who has used a compressor. However, the filter modes bring some new and exciting applications to hand. The Normal mode (see fig. 2) offers the facility to reduce the level when excess energy is present in a specific audio range, this is most commonly used for de-essing (reducing the "sss" sound in a vocal).

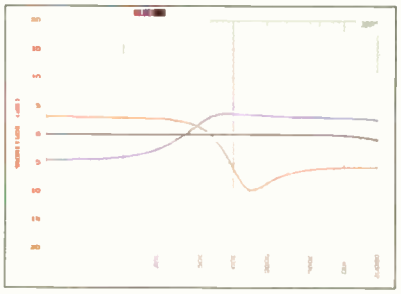

FIGURE 3: Compressor filter in Half mode. The same filter settings as in fig. 2, but now the compressor only alters the signal level of the filter's frequency band and passes out-of-band signals without compression. By connecting the two compressors in series, a 2-band dynamic equalizer is created.

The Half mode opens up a new world of creativity in dynamic control. In Half mode, the 4X4² compressor adds the filter (see fig. 3) to the audio path during gain reduction. This reduces the gain of audio at frequencies below/above the filter setting, and the Gain control now only affects the filtered audio level. Applications include reducing the mud in a vocal while the mic is being "eaten" while leaving the voice full as the singer moves back slightly. This way you can selectively attack the proximity effect of the mic without having to roll-off all of the low end. Alternatively, you can fatten a vocal by heavily compressing the vowel sounds and leaving the consonants untouched. This can allow the overall vocal level to be raised while the compression remains almost inaudible.

These filters are great for reducing the screech of fingers sliding on the guitar strings without having to reduce the high end (brightness) of the guitar or compressing the low notes on a bass guitar while leaving the high notes untouched and dynamic. Conversely, the slapped bass notes can be compressed, while leaving the fingered notes unprocessed. Combining both compressors in series with one unit compressing audio at lower frequencies and the other set to act on the higher frequencies allow you to rebuild the harmonic balance of an instrument at different volumes. You may want to extend

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Stereo operation has been improved over the previous 4X4 version with the critical controls on the slave channel (threshold, ratio, attack, and release) disabled, while still allowing the other controls to be independently used or matched as desired. This retains considerable flexibility while improving the ease with which the unit can be setup for stereo operation. Pressing the Stereo switch connects the sidechains of the compressors and the gates (except for the gate thresholds, which remain independent).

The I/O connections on the rear of the unit are actively balanced (but upside down) XLRs for each compressor and gate. Additional connections for gate external Filter (in and out); gate external Key input; and compressor Sidechain (in and out) are unbalanced 1/4-inch phone jacks. The unit is setup for +4 dBu operation and the output can only be attenuated 6 dB. This allows it to work well with the 0 dBV inserts on many consoles, but there may be circumstances where the 4x4 will overdrive devices that operate at –10 dBV.

The power cord is detachable with an IEC connector, and this connection also acts as the unit's power switch. Access to the two internal PC boards is a simple matter of removing the eight tiny Phillips screws that attach each of the top and bottom panels. Internal construction is very well done. The manufacturer shows confidence by offering a five-year limited warranty.

Congratulations to LA Audio for taking a second look at this unit and enhancing the potential for creative use of this cost-effective processor.

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

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channels, each with its own preset; with legato, each channel plays the same preset with legato triggering (i.e., changing pitch while a previous note plays does not retrigger the note, but simply changes pitch. This is essential for MIDI guitar and bass). Multi-legato adds legato response to multi. Omni and poly mode work traditionally; poly-legato allows only one voice to sound, with legato triggering. Controller-wise, the SB2 responds to volume, pan, bank select, sustain, mod wheel, pitch bend (range is ±2 octaves, although you can hear the quantized pitch "steps" with large amounts of bend), and legato on/off. An overflow mode drives a second SB2 when you need more than the SB2's 12 voices.

AUDIO ARCHITECTURE

A voice consists of two oscillators, two DCAs that mix into a single digital filter (with resonance), overall amplitude envelope, and output stage (level and panning). There are no effects. Two voices can be layered to produce a four-oscillator voice, although this limits polyphony to six notes. Layers can be switched or crossfaded via note number or several other modulation sources. Overall, the programming potential is pretty deep, as you can offset wave start points, do hard sync, switch the multi-

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For full compatibility, the HDR-V8 can be interfaced with DA88 and ADAT recorders. For unlimited mass storage, optional removable drives can be installed. Other options like remote control, SMPTE interface and multiple machine lock make the Pro Series Hard Disk Recorders king of the road. And if the standard one gigabyte drive isn't enough, the HDR-V8 is expandable to 4 gigs without sending it to the factory!

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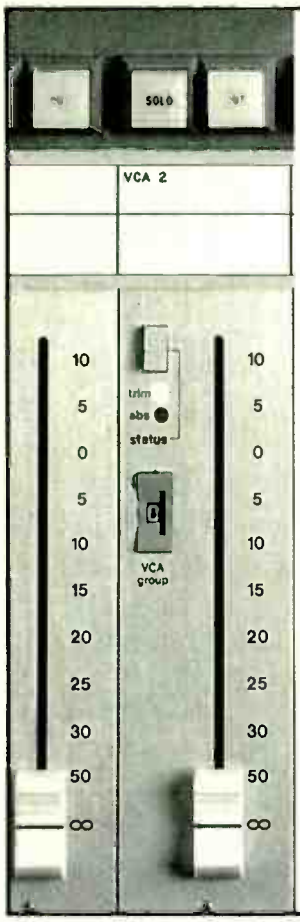

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mode filter between 2 or 4 pole low-pass/bandpass/high-pass, and use a variety of modulators (sample-and-hold with adjustable lag time and choice of input sources, portamento with modulatable time and value, six-stage envelopes, and more).

Pretty cool...but there's a catch: you can't access any of this from the front panel. Editing or creating patches requires a MIDI Quest 6.0 patch editor or a Peavey PC1600 MIDI fader unit (which lets you tweak the sounds using real faders). Thankfully, the Spectrum modules contain all the needed PC1600 presets in memory, so you can send this data to the PC1600 via MIDI and immediately begin editing; no PC1600 programming is required. Although editing can still be fairly tedious — there are a lot of available parameters, which means frequent program switching at the PC1600 — it's still a lot more interactive than scrolling through a zillion LCD pages armed only with a calculator-style keypad.

FASTER, FASTER!

The SB2 responds very rapidly to incoming MIDI data. Perhaps because of this, using the SB2 instead of one channel set to bass in a multitimbral synth seems to "lock" into a track better. While testing the SB2, teaming it with an Alesis D4 drum module (which also responds very quickly to MIDI) produced an outstandingly tight rhythm section.

RACK 'EM UP

When I first saw the front panel, I thought "preset playback synth, no big deal." However, there is a vast amount of power under the hood. I guess Peavey took it to heart that "no one programs synths," so you have the option of just using the thing and forgetting about programming — but fortunately, for tweakers such as myself you can dig in *very* deeply if you want.

If you're expanding your synth setup, check out these boxes. They are a distinct departure from the "do-all-wonderbox" approach of most of today's synths, but they deliver great sounds in their respective arenas. EQ

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"Low Z" is old news to anyone skilled in low noise design (as we've been for more than 30 years). Without getting too esoteric, lower is not necessarily better. A 200ohm microphone wants to see a bridging (i.e. 2,000 ohm) input impedance. Input impedance that is too low will reduce signal more than noise, hurting signal-to-noise ratio. Our preamps deliver a noise floor on the order of 1dB from theoretical. Only a perfect preamp would sound quieter.

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Discrete Summing Amplifiers

The next most important circuit is the summing amp. Combining tens of sources magnifies the amp's self-noise to be amplified N+1 times. Using low impedance resistors in this circuit can only reduce part of the noise. Peavey uses discrete transistor summing amps instead of the off-the-shelf ICs found in most consoles. This costs more, but we know you'd want to spend a few extra dollars when it makes such a big difference in overall performance.

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EQ

COMING UP IN MARCH

AXE TO GRIND.
EQ celebrates the arrival of spring with our second annual Guitar Recording and Sound Special. Included in this Special are stories that reveal guitar recording techniques from such notables as producer Dave Jerden and Neil Zaza, as well as a look inside the personal studios of Steve Vai and Skid Row's Dave "The Snake" Sabo. And EQ LIVE gets into the six-string swing with a profile of Larry Carlton's live setup.

LIGHT MY FIREWIRE.
If you have to transfer digital audio anywhere, then you need to know about this new data-moving technology. This already widely accepted format can speed up your transfer times and get you back to making music. Bob Moses explains how to get the most out of it.

NEW PRODUCTS.
EQ brings you the facts on many new NAMM products, as well as a closer look at Analog Device's new audio-friendly chip and our usual takes on new computer and live-sound gear.

COLUMNISTS GALORE.
EQ's gallery of noted columnists will all be on hand to entertain and educate. Look for words of wisdom from Roger Nichols, Al Kooper, Craig Anderton, Eddie Ciletti, Jon Luini, Allen Whitman, Martin Polon, and Mr. Bonzai.

To be a part of this exciting issue, contact: Kathleen A. Mackay; Associate Publisher (ext.460), Matt Charles (ext.458), Andrea Berrie (ext.471), Christine Cali (ext.454), Pete Seidel (ext.457); Advertising Sales

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ADRIAN BELEW

continued from page 72

My other strong point is that, as a person, I can be strong but flexible with people. I can listen to them and impart something to them at the same time. With Jars Of Clay, I felt like I was giving them a really good lesson in studio expertise, teaching them how to do certain things correctly. They'll probably do better in the studio from that point on. That is a role that I enjoy. As an artist, I have to wear all of those different hats at the same time.

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HOUSE OF BLUES

continued from page 112

NETSPECTATIONS
One of the coolest features of House Of Blues–Chicago is that there are over 200 locations in the facility to plug in a laptop. "We have designed these funky folk-art table lamps," continues Lyons, "and in the base of the lamps are the connectors for your laptop: Ethernet, T1, and 110AC — so you don't have to use battery power. We also have T1 and T3 lines running between the House Of Blues locations so you can stand at the bar in Chicago and look up at a monitor and see the bar in Hollywood live. You can then take a joystick and operate the robotic cameras in Hollywood, (there are sixteen cameras throughout the club) and you can decide from Chicago what those cameras are going to be seeing and vice versa for people in Hollywood, for the Chicago room. You can also put headsets on and talk to people live in other facilities." Over the top indeed! EQ

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Electro-Harmonix Deluxe Electric Mistress

EQ LAB REPORT

MANUFACTURER: Electro-Harmonix, 20 Cooper Square, New York, NY 10003. Tel: 212-529-0466.

APPLICATION: Process a guitar with flanging effects.

SUMMARY: Retains the character, warts and all, of the original.

STRENGTHS: Vintage sound without collector prices; extremely easy to use; internal power supply; metal case; manual flanging mode.

WEAKNESSES: Footswitch pops when pushed; input has DC leakage, causing volume control crackle; flanging only.

PRICE: $179 **EQ FREE LIT. #:** 132

BY CRAIG ANDERTON

THE RETRO PHASE has brought back one of E-H's most popular boxes, and this is the real thing — same weird-shaped trapezoidal case, same big knobs, and same flanging sound. Although I couldn't compare the circuitry with the original model (and the IC numbers are scraped off, think of it as "mechanical copy protection"), it appears to use analog delay bucket-brigade technology, just like the original.

The three knobs set flanger rate, width (sets the flange sweep's maximum delay; the minimum delay stays fixed), and color (resonance). A switch on the back disengages the rate control, which turns the width knob into an initial delay control for choosing a fixed, short delay (called "filter matrix" mode). There are jacks for input, flanged out, and direct out. There's also a footswitch and in a concession to the '90s, a three-wire AC cord for the internal power supply.

The sound is authentic—if you loved the original, you'll love this one. In fact, maybe the design is *too* authentic: there's some DC across the input, which can cause volume control crackle at your axe. (Then again, you're best off leaving the volume full up to maximize the signal-to-noise ratio, which incidentally seems cleaner than in the old days.) There's also a major pop when you press the footswitch.

Use the direct out with care. It appears out of phase with the flanged sound, so combining the two in mono cancels out some of the flanging effect. On the other hand, panning the flanged out and direct out to opposite sides of the stereo field gives some pretty bitchin' stereo.

Bottom line: If you missed the original the first time, or wish you'd never traded in the one you did have for a multieffects, the Electric Mistress is back. It's not perfect, but the flanging effect is sweet indeed. EQ

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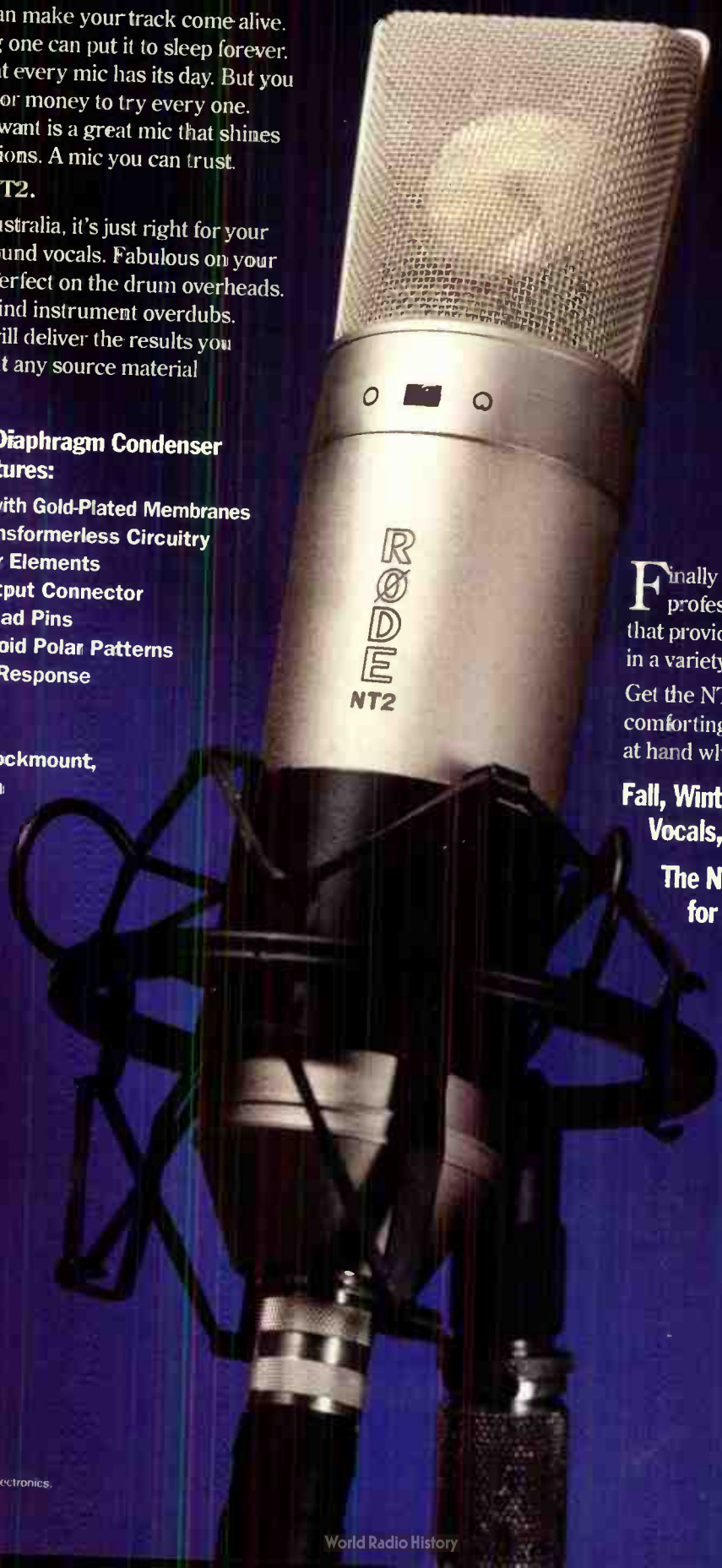

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Steinberg Cubase Score 3.02 VST

EQ LAB REPORT

MANUFACTURER: Steinberg, 9312 Deering Ave., Chatsworth, CA 91311-5857. Tel: 818-993-4091.

APPLICATION: Create complete recordings with MIDI, digital audio, automated mixing, signal processing, and even final mixdown (effects included!) within a Power Mac OS environment.

SUMMARY: It really is a studio-in-a-box, and is an excellent value for the money.

STRENGTHS: Flexible, fast MIDI sequencing; VST is very cool; excellent mix automation; already has significant plug-in support; not difficult to use; supports sound cards for highest audio quality; highly cost-effective.

WEAKNESSES: Makes a lot of demands on computer resources; Power Mac internal audio falls somewhat short of pro standards.

PRICES (all include VST): Cubase $399, Cubase Score $549, Cubase Audio XT $799

EQ FREE LIT. #: 133

BY CRAIG ANDERTON

SEQUENCERS ARE MUTATING from MIDI-specific software to do-all "studios" with MIDI, digital recording, and sometimes even decent editing and DSP. But Cubase VST, written for Power Mac technology and requiring no extra hardware, has gone one step further with "Virtual Studio Technology." This adds multiple effects, four aux sends per audio channel, stackable EQ, master effects, and more with an interface modeled on conventional mixers and signal processors. (A 68K-compatible version ships as part of 3.02, but does not include digital audio functions.)

So do you just turn on the computer, and there's your studio? That depends on your application, but the bottom line is that VST shows just how much a "desktop studio" can do — and it's pretty awesome.

There are three Power Mac Cubase VST versions, all of which can record and play back digital audio using Sound Manager, Digidesign's Audiomedia III PCI card, or Korg's 1212 PCI card. Cubase "standard" does MIDI and score printing. Cubase Score (reviewed here) adds professional-level notation. Cubase Audio XT does all of the above and supports most Digidesign boards (except the first Sound Tools and Audiomedia), the TDM bus, and includes TimeBandit 2.5 (Steinberg's time/pitch, compression/expansion accessory).

MIDI-wise, Cubase shares the same basic feature set as other high-end sequencers. Its highlights include a superbly laid-out "Arrangement" window (where you cut, copy, move, mute, and paste "phrases" of MIDI or audio data), notation and score printing, a user-hostile but powerful "logical edit" filter, drum machine mode screen, and smooth real-time operation (you can even save while the program's running). This summary isn't meant to trivialize the program, which popularized many now-established features (such as "groove quantize"). Rather, it's just that MIDI sequencers have matured, so the main differences generally involve the interface and way of handling audio.

FIGURE 1

DIGITAL AUDIO

Because VST uses the Power Mac's internal sound hardware, any computer limitations affect the program (the only non-Power Mac computer supported by 3.02 is the Performa 6400). The number of simultaneous audio channels and effects is hardware-dependent; for example, system requirements for the maximum of 32 tracks include 40 MB RAM, level 2 cache, greater than 100 MHz Power Mac, and an AV (or very fast) SCSI

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drive with a driver that supports asynchronous transfers. The 1/8-inch jacks and consumer-grade A/D and D/A converters aren't quite up to "pro" audio standards, although the Power Computing machine used for testing (see sidebar) does pass the test of, "If I do a good enough take, can I get away with bouncing it over to a real recorder?" When treated with care, onboard audio can sound very good; if you require higher audio quality, spring for a sound card.

One quirk: the monitor signal coming from the computer is delayed a bit, so while recording it's best to monitor the input signal (although with vocals, I often mix in some delayed monitor signal to add a hint of slapback in the cans).

Managing the audio is relatively simple. You record different tracks in different audio channels or stack multiple "takes" on one channel (however, only one take can play back at a time over a given channel). Recording multiple takes is wonderful for doing "composite" solos, such as vocals. You can even loop record a vocal; all takes end up in one long file, but are "stacked" into individual takes on the display. By cutting and moving start/end points, you can extract the best parts of each take. Bouncing the result to a different track creates one long audio segment. If you bounce along with effects and EQ, then you don't need to add them in real time, which frees up computer resources for other functions.

Cubase can reclaim hard-disk space by nuking unused audio, as well as prepare files for archiving, with a couple of menu commands. MIDI-to-audio, audio-to-MIDI, and

ABOUT THE TEST COMPUTER

Cubase VST was tested on a Power Computing PowerTower 166 running the Mac OS (System 7.5.3). If you're skeptical of Mac clones, don't be; the PowerTower (and now the PowerTower Pro) family fulfills the promise of a high-performance, lower-cost alternative to Apple's offerings.

The PT 166 runs a PowerPC 604 at 166 MHz. Main memory is expandable to 256 MB via four DIMM slots, and video memory to 4 MB (the built-in video can drive an Apple or VGA/SVGA-type monitor). Drives include a 1.4 MB floppy, internal SCSI AV drive, multisession CD-ROM drive, and two empty internal bays. Interfaces include SCSI, ADB, three PCI bus expansion card slots, stereo audio recording and playback via minijacks, built-in Ethernet and 10BaseT connectors, and two GeoPort-compatible ports. About the only negative point for audio applications is the relatively high ambient noise caused by dual fans.

So far so good, but this is also a well-supported machine. The manual is very helpful (surprise!) and goes into great detail on how to expand your machine with extra memory, drives, and so on. The company backs its product with a 30-day money-back guarantee, so even if you just don't like the color, you can return it. This is a smart move on Power Computing's part; I'm sure many people who would be reluctant to try a clone will figure they have nothing to lose by checking it out — and once they do, I doubt that many would send it back. If you're going to run the Mac OS, there is definitely life beyond Apple.

—CA

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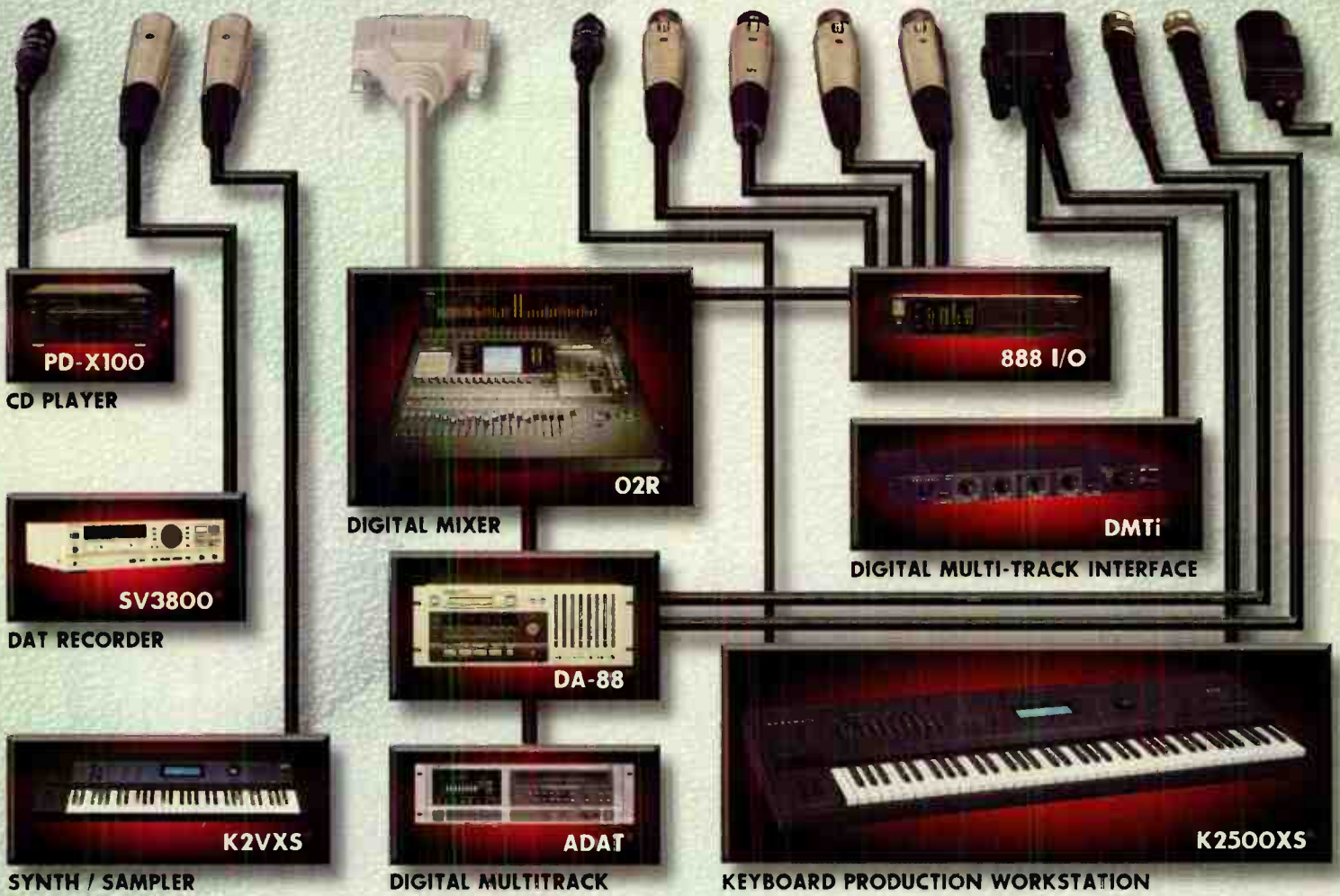

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The DMTi is a 1U rack module designed to be used as a stand alone digital signal format convertor, digital patchbay, as well as for use interfacing Kurzweil's K2500 series production stations to popular MDM formats such as TDIF, and ADAT formats found on MDM's produced by Sony, Tascam, Alesis, Fostex and others. The DMTi allows communication between Alesis Adat or Tascam DA-88 with their respective proprietary 8 channel digital formats and AES-EBU or SPDIF digital formats.

The DMTi was also designed to interface with Kurzweils proprietary 8 channel digital protocol KDS-Kurzweil Digital Stream (offered as an upgradeable option for the K2500 series). The DMTi can perform sample rate conversion (in real time) on up to 4 stereo pairs of incoming digital data while acting as the master or slave clock; the DMTi can transmit 44.1K or 48K clock and can transmit or receive BNC word clock.

This device is well suited for use with popular digital mixers such as Yamaha's O2R, or Korg's Soundlink, or as a translation device from MDM to Digidesign's ProTools systems. The DMTi allows many different digital input formats to be user routed to a variety of digital output formats and sample rate converted. The Alesis and Tascam option cards are needed for conversion to and from these popular MDM formats. The DMTi can be seen and demonstrated at your local Kurzweil dealer.

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World Radio History

audio-to-audio groove quantizing is also available, although getting good results with nonpercussive signals takes experimentation.

AND NOW, THE EFFECTS!

Fig. 1 shows the Virtual Studio in action — with these many windows available, the bigger the monitor, the better. The CHN 1 window is a "channel strip" with its fader, monitor button, effects sends (going to chorus and two reverbs), and two parametric EQ stages (one set for high frequency "air," the other for a slight bass boost). The EQ is well-implemented, sounds fine, and you can have up to four on one channel. Best of all, most VST settings can be automated — mixdown automation (fader or "rubber-band" style) handles not just level and panning, but also mute, solo, EQ in/out, effect sends in/out and levels, pre-post switches, effect bypass, and parameters for all VST effects (several "global" parameters, such as master volume, can also be automated).

The four effects are below and to the right. Each effect has nameable preset memories (32 for chorus, 64 for reverb, 16 for stereo delay, 16 for autopanning), several pages of parameters, and parameter adjustment options.

The master window ("LR," toward the right) has a mono switch — something I always appreciate in mixers — and four "slots" designed specifically to handle plug-ins. The Master Effects window shows the Stereo Wizard plugged into one of the slots.

The lower left shows the monitor/mixdown screen. The background red files are segments of various vocal takes produced by loop recording. Note that the lower half of the file marked "Channel 12" has a volume envelope rising toward the end of the file. Also, one of the segments has been opened in the waveform editor and is about to be normalized. The lower right shows the transport bar, and you can just see the arrangement screen poking its head out the upper right quadrant. The tracks show event density rather than names in this view. About the only real limitation here is that you can have only one audio editing window open at a time.

The effects quality is comparable to above-average on-board synth effects — not exactly a Lexicon 300, but totally acceptable when used in context. I was initially disappointed in the reverb, but used my favorite "how-to-sound-expensive" reverb trick (layer two reverbs together with slightly different parameter settings) and the result sounded wonderful. The delay, chorus and autopan are also eminently useable. Unfortunately, there's no dynamics processing (compression, expansion, etc.) included, but there are plug-in "hooks" and several companies are working on VST plug-ins. At the last AES, Waves showed their set of VST-compatible plug-ins for $600 (including the L1

continued on page 136

TWO WILL GET YOU EIGHT

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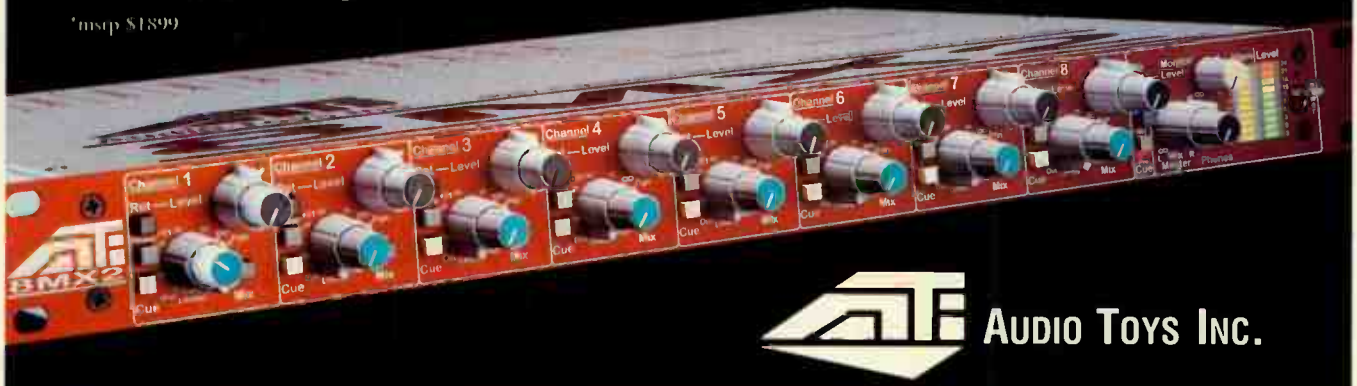

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HENRY ROLLINS

continued from page 54

That's part of the live thing. Henry likes to move around a lot when he's singing and he really gets into it. You can't give him a $5000 Neumann mic on a stand and tell him to just stand there. We gave him a Shure SM58 and let him go off on it. We tried several mics, but we always ended up coming back to the '58 because it sounded the best.

Thompson: When it comes to something like that, the most important thing that I can stress to anybody who wants to be a producer — or is a producer — is that if you go through the test of time, there are a lot of Lo-Fi records that feel amazing. Why? Because the focus is on the feel of the band and the performance. That's the school that I come from. If it suffers a little bit sonically, which thank God it didn't, who cares as long as the feel of that performance is there. That, to me, is the key thing when you're recording. A lot of people say, "Hey, let's go for the perfect sound." Let's not go for the perfect sound, let's go for the perfect feel. That's what recording's all about, and a lot of people have a tendency to miss that.

Norrell: With the handheld mic it sounds very real. It sounds like the band performing live. I'm a producer myself, and I totally agree with what Steve says about capturing the feel. I wasn't going to mess with the sounds for three days and then settle. I get it going, and while they're feeling good, we get it down on tape. If anything needs any slight tweaks, I'll do it when we mix.

Thompson: It's the first-day philosophy. I like to capture a couple songs on the first day and spend four or five hours setting up the band — not two or three weeks. Do you think these people are going to have the spontaneity to perform these songs hanging around for two or three weeks, dicking around with sounds? They're able to go in and bang the crap out because the less time people have to think about what they have to do, the better off it is. The more time you have to think about something, the more time you have to screw it up. That was our game plan: don't give them time to think about anything. It feels the best that way.

Sonically, the album is extremely dynamic. Did you end up using any compression in the recording process?

Thompson: I'm not a big fan of compression because I think things should jump out in your face. That's the main reason why bands are making this type of music. Sometimes you have to compress things such as an overdynamic vocal performance because there's no way that you can get away with it. But, for the most part, what I respect about Clif is that he feels the same way about compression as I do. You compress when you record, you compress when you mix, you compress when you master, radio hits the compression heavy...it's so over-compressed at that point that you have to draw the line. You know they're going to compress in mastering, that's a God-given thing, so we like to ease off as much as we can so the compression is the right compression when it's all said and done. The bottom line is we're pleasing the people who are buying that CD first. We're not trying to please the media; we're not pleasing radio — we want to educate people.

Norrell: You also get the dynamics there. With the Rollins Band's music especially, it's not on ten all the time. There're great quiet parts in the songs that we want to keep quiet and make it so that the loud parts are actually louder and not that they *seem* louder. That's one thing that Steve's been doing a lot as we've been rough mixing. He's been working the faders and just taking the dynamics that the band created and he's been making them even more radical. He'll take the quiet parts and just bring things down even more instead of compensating and trying to bring them up so you can hear them.

In closing, do you have any tips for producers or engineers who are looking to expand on their craft?

Thompson: Variety is the spice of life. No matter how good you are at your craft, you need to change it up, because when you go back to it you become that much better. I think it's really important to keep doing things that are totally different. My next project, after the new Blues Traveller record, is an R&B band that I just signed that's going to be the Marvin Gaye "What's Goin On" band for the '90s. It's just totally different.

Norrell: Before I was on this project, I was mixing the new Widespread Panic album, and they asked me what I was doing next. When I told them I was going to be working with the Rollins Band they flipped out.

Thompson: That's what keeps you fresh and interested in what you're doing. It keeps you away from that assembly line vibe. It's a new challenge, because no matter what type of music you do, you can always apply certain styles of different types of music into what you're doing, which makes it better, and that much more interesting. EQ

CUBASE VST

continued from page 134

Maximizer, C1 Compressor, S1 Stereo Enhancer, and TrueVerb room ambience simulator). Arboretum Systems and Steinberg will also offer several plug-ins. The program ships with two plug-ins: Stereo Wizard (a stereo image "expander") and a chromatic tuner.

IS IT COOL?

There are way too many features to list here — QuickTime movie support, arbitrary "snap" points in digital audio files, digital mixdown (mix everything down to two tracks within the program and it gives you an interleaved AIFF stereo file), the ability to import ReCycle! files, and the advantages of adding TimeBandit. And we haven't even touched notation! Steinberg has been tweaking this sequencing engine for a while, and they have it down.

My only real gripes involve some interface functions. When adjusting the virtual knobs, you move the mouse up to go from zero to halfway up, then down to go from halfway to all the way up. I'd prefer moving the mouse in a line from low to high to turn the knob from full off to full on, and vice-versa to go back to full off (although you can click on a "knob" to instantly assume the setting where you clicked, sometimes you want to be able to vary a setting in small increments and hear the changes). Finally, the Toolbox options have no assigned function keys or keyboard equivalents — creating some in QuicKeys will save you much time.

The real star here is the digital audio: assuming you have the requisite computer, less than $400 bucks gets you the brains of a complete studio — add some MIDI instruments and a mixer, and you can do at least broadcast-quality work. Just think how much this would have cost just a few years ago, and you start to appreciate what this is all about.

For songwriting, Cubase VST is a tough act to beat; it's so much easier to edit MIDI tracks when you can also hear the acoustic tracks, effects and all. Even if you eventually recut the audio on some other system, Cubase VST is invaluable for preproduction — and should you capture a fabulous take using the internal audio, the quality is good enough to be useable.

Overall, Cubase has always been a popular program, and now VST makes it even more attractive. As to whether this product meets its stated goal of being a virtual studio, the answer is simple: for a surprisingly large number of applications, it's all you really need. EQ

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Oh, did you hear that EQ has a web site at http://www.eqmag.com? It's the most high-tech way to get the latest information on the newest products.

Oh really? Well if they're so high tech how come we're in black and white?

World Radio History

More of the Song Heard 'Round the World

More tips and techniques for placing your song on the Web (part 2)

BY JON LUINI & ALLEN WHITMAN

Photo by Steve Jennings

Welcome back and thanks again for the comments, feedback, and helpful spam. Last time, we got a ten second soundfile onto your desktop. This month, we're taking the next step: putting it on the World Wide Web, where anyone and everyone can hear it.

We've used audio capture and edit utilities like SoundEdit 16 or Cool Edit to create the soundfile. Now we're going to take that raw soundfile and convert it into a smaller (read: manageable) file for placement on the Web. We will create the two common forms of accessing audio on the Web: "streaming" (or "stream-enabled") and "on-demand." To review: Streaming audio means that the listener can play your files in real-time with playback beginning right after the click of a mouse on a Web page. On-demand means that the listener must click, download the entire file, and when it's completed (minutes or hours later, depending on the file size), listen to the song.

STREAM-ENABLED

To create a stream-enabled soundfile, we'll continue to use RealAudio because it's free, cross-platform, and we've been working with it. Shockwave, LiquidAudio, and Xing StreamWorks also perform these functions with similar methodology. Please refer to the first FezGuys column for these programs' respective URLs. [Look in *EQ* Nov. '96 or log on at http://www.fezguys.com/.]

For the creation of a stream-enabled soundfile, start the RealAudio Encoder. Press input and choose your soundfile. From the dialog box menu select any of the 28.8k settings. Try playing with other compression algorithms to hear the difference in audio quality. If you'd like, save the file in a variety of formats and play them back on your computer to see which one you prefer. (Note: If you encode into a RealAudio 3.0 format, the audio file will require a RealAudio 3.0 player to play it.)

You now have an encoded and compressed file on your desktop that is called "yourfilename.ra." The ".ra" suffix is the default name for files encoded using RealAudio.

Look at the documentation for all other fields and familiarize yourself with this app. There are no manuals, but there is an extensive help section on its Web site.

There are two discrete files for Web placement of a stream-enabled file: a metafile (yourfilename.ram) and the actual encoded soundfile (yourfilename.ra). A metafile exists on your server and is a pointer to that actual encoded soundfile that exists on a RealAudio server. That is, to have a soundfile be stream-enabled, it has to sit on a stream-enabled computer (server). Your computer probably isn't stream-enabled, but your ISP's server might be. Ask 'em. You are going to move a copy of your .ra file to a server that supports your sound app (in this case, RealAudio). The process of placing the audio metafile and the actual audio file is handled by your File Transfer Protocol (FTP) app. The process of creating the actual file is handled by your encoding utility (in this case RealAudio). A metafile is simply a text file that, for RealAudio, looks like this: pnm://realaudio.server.com/path/to/yourfilename.ra. What you enter for "realaudio.server.com" and "/path/to/yourfilename.ra" will depend on the name of the computer that is running the RealAudio server and how it is configured to find the file you have placed there. If your ISP is providing this service, they can tell you what to put there; if you are doing it yourself, there is documentation included with the RealAudio server.

ON-DEMAND

To create an "on-demand" MPEG audio file from a Windows WAV audio file, use the Cool Edit MPEG plug-in. Download this MPEG filter from the Cool Edit site (http://www.syntrillium.com/cool96.htm). Follow their directions for installation.

A Mac AIF-to-MPEG audio file conversion tool can be found at http://www.home.ptd.net/~warnergt/. There are more efficient apps and plug-ins that perform this function, but these particular programs can be downloaded free right now. Support the author, of course, by giving them feedback and/or an optional registration fee.

Download, install and open the app. For Windows users running Cool Edit, choose your soundfile and "save as" (or "export"). For Mac users running the MPEG Audio Coder (MPEGAud), open the app and choose File->Encode. *Note:* MPEGAud will not run on a PowerBook unless it has an FPU (floating point math coprocessor) installed.

From the various options we'll choose the layer, bitrate-per-channel, and mode. Again, familiarize yourself with the apps' different options. For our purposes choose:

Layer: II (as opposed to I)

Bitrate-per-channel: 96 kbps (kilobits per second)

Mode: stereo (as opposed to quadraphonic!)

The higher the bitrate the larger the file. Layer II at 96 kbps is "near-CD qual-

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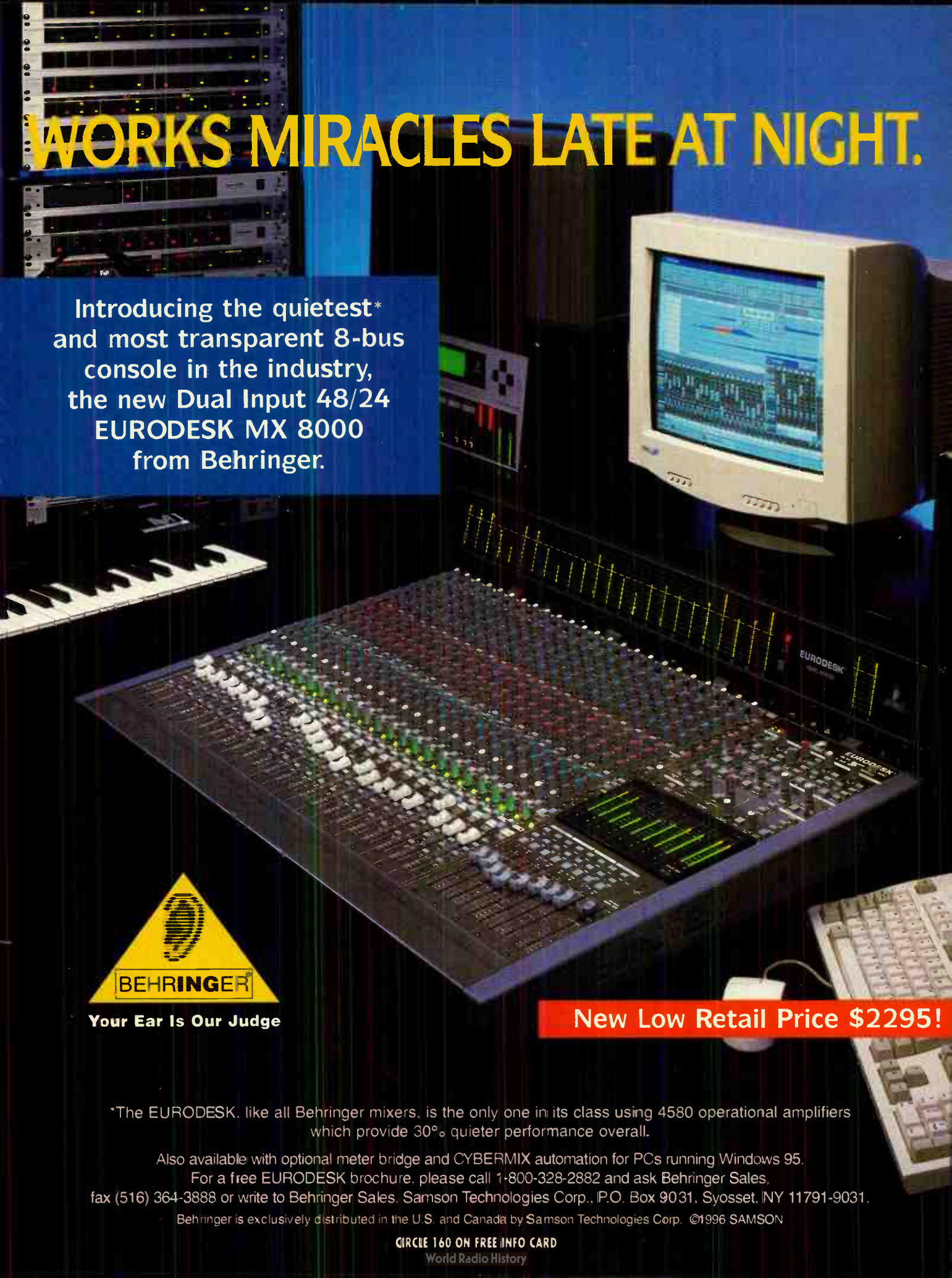

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MORE THINGS THAT ARE NEW

• RealAudio finally has released beta players for UNIX machines to play its new 3.0 files. No longer must UNIX users be left out in the cold for new RealAudio 3.0 content. (**http://www.realaudio.com/**)

• Macromedia announced that Shockwave support Marimba's Castanet Tuners. Say what? Don't worry, it just means that if you create Shockwave Audio content, you can now bring it to people using another new technology. (**http://www.macromedia.com/**)

• The beta version of the new release of Apple's QuickTime can now play back MPEG audio files! (**http:// quicktime.apple.com/**) The newest audio streaming player on the block, AudioActive, can play back Shockwave Audio files. If you've got a lot of money, you can also buy its live encoder packages. (**http://www.audioactive.com/**)

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ity" (which is a euphemism for: "I can make out the lyrics!") and the lowest Layer II supports is 32 kbps. It is common to place several copies of the same song using various compression methods covering a broad spectrum of playback technologies. Experiment. (*Note:* 24kbps is the compression threshold for streaming audio over the Internet to a 28.8k modem user. This is an on-demand MPEG soundfile, so file size is not as much of a concern as it is when a soundfile is stream-enabled. You might as well make it sound as good as possible.)

Save. Then wait. These apps tend to be slow. For example, a ten second clip encoded with the above parameters will take several minutes to process. Have some soup. It's winter and you've been working hard.

When you return to your computer with your steaming mug of soup, an on-demand soundfile will be on your desktop with the suffix ".mp2." Be sure to test your soundfile. You'll need an MPEG player like we listed in our first column. Test locally, play globally!

PLACING IT ON THE WEB

In order to place your web-ready soundfile file on the Web, you must first have somewhere to put it. Your Internet Service Provider (ISP) should, as part of your account, provide you with some disk space on their server. Two MB is common, and is plenty for our needs.

You are going to transfer your file from your computer (the client) to your ISP's computer (the server) using a technology called File Transfer Protocol (FTP). You'd think that a degree in rocket science is necessary to manipulate the language of the Internet but no, it isn't. Windows comes with an FTP client already installed. Mac users should get Fetch, the most common Mac FTP

continued on page 144

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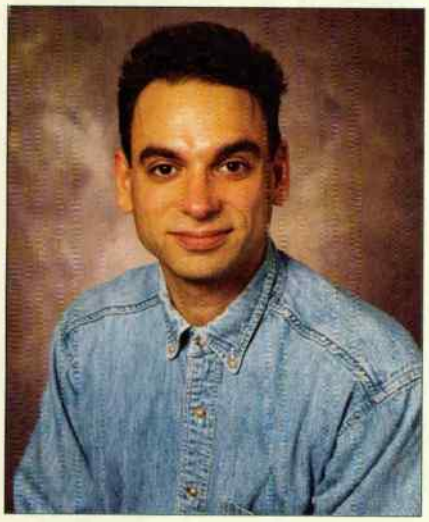
Mastering: A "Medium" (Rare) Overview

We can still learn from media that has passed on

BY EDDIE CILETTI



It doesn't matter whether the medium is DVD or vinyl, CD or cassette — the keyword is "medium." Hey, if any of these formats were "amazing" we'd call them that, right? OK, so maybe I'm taking this a bit (or is it a byte?) too far, but the fact remains: all storage *media* are flawed in some way.

History has shown that analog's "flaws" eventually became its desirable qualities. This month's overview of recording media — specifically records — will show that even "dead" technology has something to teach us. This is, hopefully, the first of several overviews of audio's obstacles — past, present, and future.

MASTERING 101

Danny Caccavo, who is a knowledgeable recording and mix engineer (as well as Mellotron owner), has remastered and remixed numerous projects using Pro Tools (see table 1 or visit http://www.users.interport.net/~danielj/ on the Web for credits). As a listener, one of Danny's obstacles to CD reissues was the standard complaint: excess, or harsh, high frequencies and/or the lack of low-frequency "warmth."

When he first began receiving tapes for remastering, Danny's first observation was that they seemed excessively bright or at least, "much brighter than he remembered them." We discussed this subject to death several times, and at one point I showed him an Ampex 351 tape machine manual containing references to the Ampex Master Equalization (AME) curve. AME improved the apparent signal-to-noise ratio by boosting the 2 kHz to 6 kHz region during record and taking it away during playback. It was intended for in-house use only.

PLUG-INS

Danny obtained a print-out of the AME curve from Standard Tape Laboratories, then modeled an inverse AME-style curve using the Waves Q-10 EQ plug-in for Pro Tools. He found that, in some cases, it made old recordings much more listenable. During the late '50s and early '60s, most mono record players didn't have tweeters, let alone the ability to reproduce above 10 kHz — explaining why many pop recordings seem overly bright when played on modern equipment (tape or disc). Many of the final Motown mixes were approved using car speakers — EQ'd so they'd really cut through AM radio and jukeboxes! In the case of the Temptations project (which were not AME recordings), the inverse AME curve serves as "corrective" equalization.

In addition, the Waves C-1 dynamics plug-in features a "split mode" that allowed Danny to create a dual-band limiter that simultaneously limited high frequencies (de-essing) while also smoothing out some low-frequency peaks and troughs (compression). Later, on an Arthur Lyman project (which actually did use the AME curve), Danny applied the inverse curve via the Focusrite D-2 TDM plug-in.

RECORD EQ

While in L.A. for the '96 AES, I visited veteran mastering engineer Wally Traugott at the Capitol Tower. During training (in the mid '60s), he recalled being instructed to roll-off high frequencies above 12 kHz and low frequencies below 47 Hz when cutting 45's. Excessive low frequencies make the grooves more difficult to track for phonographs at the bottom of the food chain.

The RIAA EQ curve (see inset in fig. 1) already includes a serious high-frequency boost. Rolling off frequencies above 12 kHz preserved the playable information while discarding that which is either untrackable or potentially damaging to the cutterhead. (Later, helium had to be pumped in to keep coils cool.)

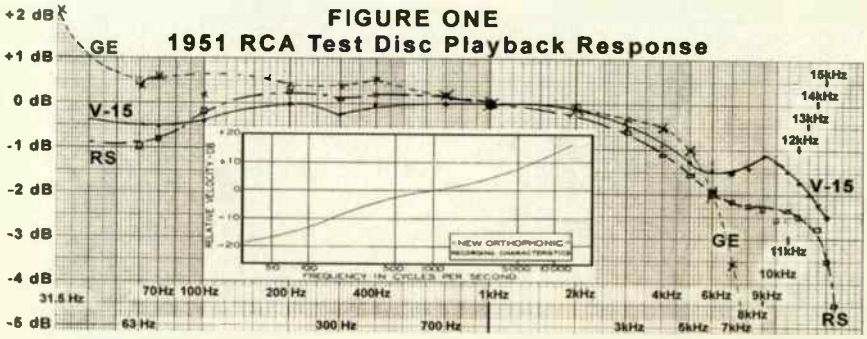
VOLUME WARS

The '60s were the battleground for the "volume wars." Some records were mastered as loud as possible to "override" the automatic volume control (AVC) circuitry built in to most jukeboxes. Columbia, Epic, and London were most guilty of generating product that was obviously distorted (and using a cheap plastic — polystyrene — that was very unforgiving), while Capitol and RCA stayed within safe margins and almost exclusively used vinyl.

TOOLS

Meanwhile, my odd assortment of vintage listening tools includes a Rek-o-Kut turntable outfitted with an original General Electric VR-II mono magnetic cartridge featuring both a 1 mil (.001 inch) "Microgroove" stylus as well as a 3 mil "Standard 78" stylus. (This turntable also had a separate arm for playing stereo records!) Before doing any tests, I noticed how great my 45 col-

FIGURE ONE
1951 RCA Test Disc Playback Response



World Radio History

lection sounded with this combination. Even the really scratchy ones sounded better than they did on my more sophisticated system. Why?

Fig. 1 is a hand-drawn frequency response chart of a 45 RPM RCA test record (circa 1951) played with three cartridge/turntable/preamp combinations. (The inset shows the record EQ curve.) A mixer permitted adjustment of playback levels using the 1 kHz tone as the reference. The "warmth" of the VR-II comes from a gradual rise below 1 kHz that, from 400 Hz down to 50 Hz (three octaves), is up 1/2 dB. (Notice the 2 dB "rise" at 31.5 Hz as well!) At the opposite end of the spectrum is a pretty serious roll-off hinging at 4 kHz. The VR-II's 1 mil stylus is too fat to track dainty high frequencies, hence the response at 7 kHz is down 3 dB while 12 kHz is down 10 dB and off the chart! And that's where all the screetchies went!

In the late '50s, stereo records required not only a special cartridge, but also a smaller stylus (.7 mils or .0007 inches), which improved high-frequency response. Up until this point (he-he), the tip was still "conical" (cone shaped), but elliptical stylii — as both of the modern cartridges are equipped — reveal that, even in 1951, extended high-frequency information made it to the record. The Shure V-15 Type IV, for example, delivered 9 kHz and 15 kHz at –1.25 dB and –2.5 dB, respectively. (*Note:* The system was not tested with a "modern" reference disc to determine actual performance.)

While the three playback systems were calibrated at 1 kHz, I played an original 1960 pressing of The Orlon's "South Street." (I am originally from Philadelphia, yew know!) I made transfers to DAT and edited three identical sections together for comparison. (See the download sidebar for soundfile samples.) The difference between the VR-II and both Shure cartridges is like the difference between AM and FM, respectively.

ARTISTIC DECISIONS

I can tell you from experience that

continued on page 160

TABLE 1: DANNY'S DISCOGRAPHY

Reissues

James Brown	*Funk Power - 1970: A Brand New Thang* (Polygram)
	"Give It Up Or Turn it a Loose"
	"There Was A Time (I Got To Move)"
	"Get Up I Feel Like Being A Sex Machine"
	Foundations Of Funk — A Brand New Bag: 1964–1969 (Polygram)
	Out Of Sight/Bring It Up (live)
	"Cold Sweat" (alternate take)
	"The Popcorn"
	"Licking Stick-Licking Stick" (live)
	"Brother Rapp"
	"Mother Popcorn" (live)
The Spinners	*One Of A Kind Love Affair — The Anthology* (Atlantic)
	How Could I Let You Get Away (live)
Roy Ayers Ubiquity	*Live At The Montreux Jazz Festival* (remixed/mastered) (Verve)

CD Mastering Credits Include

The Temptations	*Anthology* (Motown) 31453-0524-2
	Shaken Not Stirred (various artists) (HiFi/Ryko)
Arthur Lyman	*Taboo* (HiFi)
	With A Christmas Vibe (remixed/mastered) (HiFi/Ryko)
	Sonic Sixties (HiFi/Tradition/Ryko)
	Hawaiian Sunset (remixed/mastered) (HiFi/Ryko)
Bernabé de Morón	*Flamenco España* (Tradition/Ryko)
Coleman Hawkins	*Hawk Talk* (Tradition/Ryko)
Mark Brine	*New Blue Yodel* (mixed/mastered) (<re:signed>)
Oil Can	*Once Were The Pastures Of Plenty* (Unsigned)
East River Pipe	*Poor Fricky* (Merge)
	Mel (Merge)

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— Frank Serafine, sound designer

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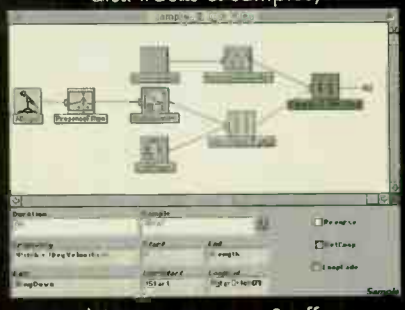
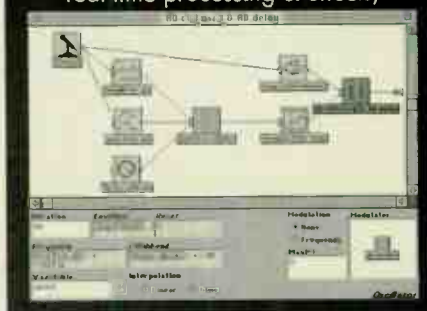
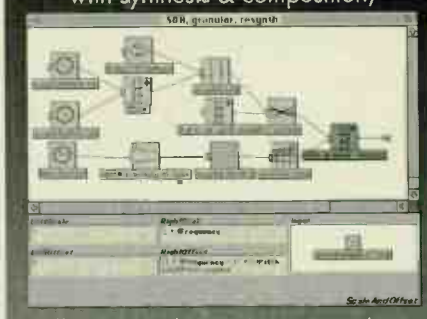


real time processing & effects,



with synthesis & composition,



all generated in real time on a box full of DSPs attached to your computer.

A few minutes with a Kyma system, and you'll be certain that the future has arrived.
— Dennis Miller, Electronic Musician

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CIRCLE 83 ON FREE INFO CARD

World Radio History

THE FEZGUYS

continued from page 140

client utility. Download ftp://ftp.dartmouth.edu/pub/software/mac/Fetch.sit.hqx and follow the installation instructions.

Use your FTP client app to upload your soundfile. Look on the 'Net for resources regarding this process. Your ISP tech support may also be kind enough to help.

IN A NUTSHELL

To recap: Manipulate the soundfile on your desktop into a web-ready soundfile. Place the file on your server using your FTP client. Access the file using your server account, your browser (we've been using Netscape 3.0), and audio player (we've been using RealAudio 3.0 and MPEG Layer II). If everything is working correctly, you have a soundfile on the World Wide Web for anyone and everyone to hear. Now link it into your web page, test it once more, then try it with a full song!

If, when you click to hear your song, you get a window full of garbage instead of the soothing strains of your song, don't worry! It's not your fault. Should this occur, contact your friendly neighborhood Web Server Administrator and have them add the correct MIME types (those pesky things that tell your browser what kind of file you are downloading) for your soundfile (RealAudio or MPEG for our examples).

What good is having your music on the 'Net if no one knows about it? The Secret Knowledge behind the success (as defined, in this case, by how many people listen to it) of your soundfiles on the web is promotion. Put the URL for your music everywhere. On stickers, T-shirts, letterhead, cassette jcard, CD insert, tattoo, bus kiosks, billboards...you name it. In short, the old rules apply. Just because you build it doesn't mean that they will come. It all comes back to the arcane alchemical metaphysics of marketing and promotion. Evil? Maybe. It's not the tool, it's how you use it. Useful? No question.

LETTERS, WE GET LETTERS

Let's go to another letter: *Dear FezGuys: In your last column you mentioned a "normalizing" filter. What is that? —dg*

Dear dg: A normalizing filter is a rudimentary compression algorithm that squashes your soundfiles' audio content into a reasonably flat dynamic range. This enhances aural clarity in the playback stage.

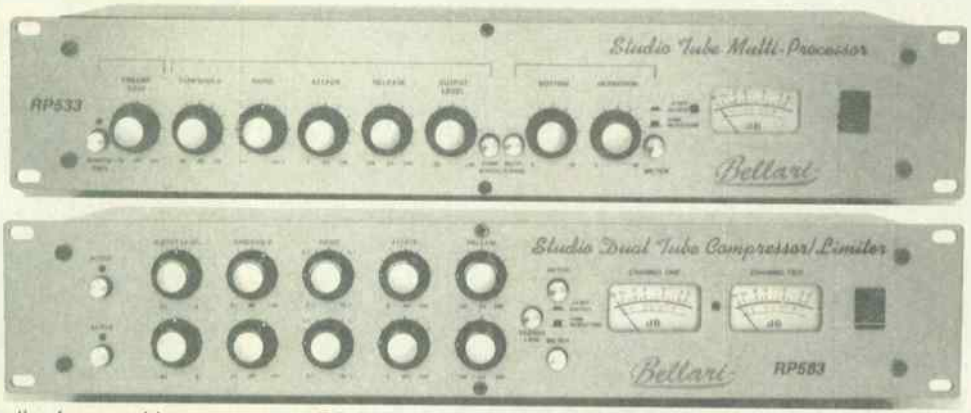
All right: see you next month when we review LiquidAudio. We really, really, really swear we're gonna do it this time.

We welcome your comments. May the Fez be with you! Please check out the FezGuys Web site (http://www.fezguys.com/) all columns and info are there.

Jon Luini is a working technophile, a musician (bass player/singer) with a full-blown facility and extensive experience on the Web, and no free time. He was a co-founder of IUMA and currently is a partner/founder of MediaCast and executive vice president of Addicted To Noise. [jon@luini.com]

Allen Whitman is a working musician (bass player/singer) with rudimentary technical knowledge and a keen, real-world interest in the practical use of the Web. He currently plays in the San Francisco-based band The Mermen. [mermen@mermen.com]

Turn Gold Into Platinum!



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RP583 Studio Tube Compressor/Limiter $700
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EQ SHOPPER

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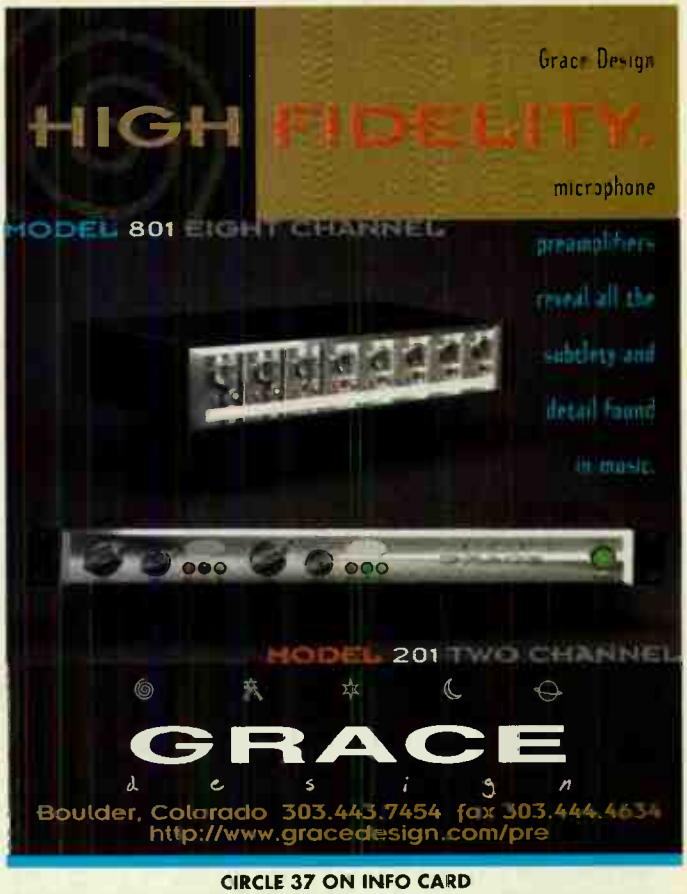

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Sound Advice

Rick Chertoff	Ray Benson
Joan Osborne	Ray Kennedy
William Wittman	Steve Earle
Too Much Joy	Willy DeVille
Cyndi Lauper	The Steve Miller Band
Butch Vig	Asleep At The Wheel
Soul Asylum	John Cale
Garbage	Freedy Johnston
John Siket	Audioforce
Sonic Youth	Millbrook Sound
The Dave Matthews Band	Bearsville Studios
Tom Jung	Justin Niebank
The Roches	Martin Brass
Boonshoft Vintage Rentals	Freddy Jones Band
Mark Egan	Stuart Sullivan
John Scofield	Bob Mould
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Joe Chiccarelli	Dave Thoener
John Agnello	Bon Jovi

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TASCAM

102 MKII / 103
Stereo Mixdown Cassette Decks

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

They Feature:
- 60dB signal-to-noise ratio and wide frequency response using any type of cassette tape
- Dolby B/C noise reduction and Dolby HX Pro extends high frequency performance up to 6dB and minimizes distortion
- Bias sensing electronics automatically chooses best recording settings for the type of tape you load – Normal, Metal or CrO2
- Record/Mute autospacer automatically inserts 4 seconds of silence between songs or broadcast segments
- Independent L / R stereo level and master record level controls

Tascam 103 Advanced Features:
- 3-head system allows you to record on a tape and monitor it at the same time, without rewinding
- MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction

202 MKIII
Dual Auto Reverse Cassette Deck

Provides high-fidelity sound reproduction and a wide frequency response, as well as a host of features to help you easily dub, edit, record or playback onto/from one or two cassettes.
- Normal speed and high-speed dubbing
- 4-second autospacer
- Dolby HX Pro sound extends high frequency performance and minimizes distortion on Normal, Metal and CrO2 tape.
- Create a professional-sounding composite tape from several sources. Functions like Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks you want.
- Twin two-head cassette decks in a durable rack-mount housing that can be used separately or in tandem during recording and playback for total flexibility.

302
Double Auto Reverse Cassette Deck

All the features of the 202 MKIII, plus more recording and playback flexibility. That's because the 302 is actually two independent cassette decks, each with their own set of interface connectors, transport control keys and noise reducing functions.
- Auto mixdown capability on both decks
- Independent simultaneous record capability-both decks
- Independent RCA unbalanced in/out for each deck
- Cascade and Control I/O let you link up to 10 additional machines for multiple dubbing or long playing record and playback applications.

112 MKII
Stereo Cassette Deck

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

112R MKII
Bi-Directional
Stereo Cassette Deck

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

All the features of the 112 MK II *plus*—
- Three-head transport with separate high-performance record and playback heads. The heads combine with precision FG servo direct-drive capstan motors to provide the highest standards of reproduction quality and performance.
- Hysteresis Tension Servo Control (HTSC) virtually eliminates wow and flutter by maintaining consistent back tension on the tape all through the reel, combatting inconsistencies brought on by extreme temperatures and humidity.
- Auto Reverse mode plays or records in both directions before stopping, switching sides on the fly.
- Continuous Reverse mode allows you to loop the tape during playback up to 5 times, or record in both directions without pausing to flip the tape and re-engage the record mechanism.

marantz

CDR620 Compact Disc Recorder

The CDR620 is a next-generation stand-alone write-once CD recorder. It offers a truly comprehensive set of features for a wide range of applications including recording studios, mastering facilities, post production, broadcast and more.
- Includes a sample rate converter, a DAT start ID/CD track converter, auto-increment mode, an ISRC encoder, programmable digital fade-in/out and an index recording capability.
- SCSI-2 interface for connection to popular hardware/software and virtually any PC for use as a CD-ROM recorder.
- High oversampling 1-bit A/D (64x) and D/A (128x) converters.
- Subcode sensing or adjustable level sensing for automatic track incrementing. Also supports manual track incrementing.
- Wired remote provides control and status of all CDR620 operations. Both index and ISRC code recording can be activated, as well as catalog number recording (EAN/UPC). The remote also supports copy prohibit on/off and emphasis on/off.
- Ignores SCMS (Serial Copy Management System), permitting unlimited archiving.
- Has a comprehensive array of analog and digital inputs/outputs, including multiple digital audio interfaces (AES/EBU and IEC-958-II) and balanced +4/-10dBu selectable analog input and +4dBu balanced analog output.
- 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 for field recording, the PMD line is also the value leader. They all feature RCA line input/outputs, 1/4-inch headphone jack, built-in speaker, pause control, audible cue and review, tape counter, full auto shut-off and low battery indicator.

- All models except the PMD-430 have 1/2 speed playback/record capability. With 1/2 speed playback, musicians can slow down complicated passages for analysis. And when played back at 1/2 speed, the pitch is lowered by exactly one octave, so the notes are still musically correct—ideal for figuring out complicated solos or picking patterns.
- By recording at 1/2 speed, a three hour meeting can be recorded on a single tape. A built-in mic and automatic level control make operation simple, and built-in speaker makes transcription convenient.
- 1/2 speed recording is equally ideal for churches, because 90 minutes can be recorded on a single side of tape—no interrupting to flip the tape over.
- Three standard 'D' cell batteries provide up to 7-1/2 hours of operation and the optional RB430 rechargeable battery delivers up to 5-1/2 hours.

	PMD-101	PMD-201	PMD-221	PMD-222	PMD-430
General					
Stereo/Mono	Mono	Mono	Mono	Mono	Stereo
Heads	2	2	3	3	3
Inputs/Outputs					
Mic Input	1/4-inch	Miniplug	Miniplug	Mini/XLR	1/4-inch
Condenser Mic	Built-In	Built-In	Built-In	Built-In	—
Remote Jack	—	Yes	Yes	Yes	—
Modular Tel. Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR/dbx NR	—	—	—	—	Yes
Mic Attenuation	—	0,-10dB, -20dB	0,-10dB, -20dB	0,-10dB, -20dB	0,-15dB, -30dB
Ambient Noise Cont.	—	Yes	Yes	Yes	—
MPX Filter	—	—	—	—	Yes
Manual Level Control	—	Yes	Yes	Yes	—
Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pitch Control	±20%	±20%	±20%	±20%	±6%
Bias Fine Adj.	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
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 indicators
- Side A or A/B select button
- Stop all tapes instantly, at any point during the copy or rewind cycle.
- Short tape indicators alert you if a tape stops before the original does, identifying incomplete copies caused by jam or short.
- Automatic or manual selection of rewind and copy operation.
  –Rewinds tapes to the beginning or end automatically (AUTO mode) or manually.
  –In AUTO mode the copy button activates the entire rewind/copy/rewind sequence. In manual it starts copying immediately.

ACC2000 Mono MasterModule:
- 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.

ACC2030 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. Connects 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 ACC4000Copy 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.

Shown with optional ZM-1 Shockmount

E-300

A multi-patterned side address mic that combines vintage capsule design with advanced headamp 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 11dB. Ideal for the most critical applications.

Unique powering of all mics is accomplished with a pair of rechargeable nicad 9 volt batteries in combination with a coil of extra power. This combined solution cures many problems associated with most phantom power supplies and can supply ten times the current.

E-200/E-100

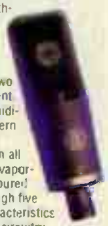
The first member of the current Equitek family, the E-200 is also a dual capsule side address multi-pattern condenser mic, but with lower specifications than the E-300. The E-100 uses the same electronics as the E-200, but with only one of the same capsules in a supercardioid pattern.
- Frequency response of 10 Hz to 18 kHz
- Dynamic range of 137 dB • Low self noise of 16 dB

audio-technica.

AT4033
Cardiold 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 recordings.
- 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 ambiance, 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 response 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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- Independent on/off switches
- -10 dB/-4 dB switch on each channel
- Voltage Controlled Attenuator (VCA) 1001 outperforms all other VCA's.
- Linkable pairs for stereo applications

107 Tubessence
Dual Channel Thermionic Mic Preamp

The 107 provides two discrete preamp 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 red LED indicator
- Low cut filter with red LED indicator: 80Hz, 12dB/octave
- Polarity invers on 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 Aphex 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 -10dBV/+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 available reverb, pitch delay, delay, chorus, flange, phase, ambience, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit analog conversion, AES/EBU and S/PDIF digital inputs/outputs, "Wizard" help menus, 16-bit dithering tools, Tap and MIDI tempo 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 hall 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.
- Sidechain 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.
- In/out 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 multieffects 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 knobs provides complete control over delay time, reverb decay etc. by allowing you 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 interfaces 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 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 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 Prosessor 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.
- Provides complete MIDI implementation, so you can change programs and modulate parameters in real time with MIDI controllers (pedals, mod wheels, etc.)
- Each of the 128 preset and 128 user-editable programs use one of 32 configurations, or arrangements of effects. You can set up mono or stereo single effects, dual mono effects with separate mono in and out for each channel, and multi chain configurations that provide two or three effects at once.

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 32 and an ADAT XT

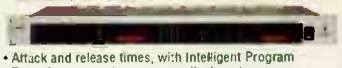
ART

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 - +40dB 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.

White instruments

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 I.S.O. 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 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 of dense polypropylene foam, with a choice of black, gray or white finish.
- Pleasing enclosure allows it to easily fit into any environment.
- A host of mounting systems including ceiling, rack and 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 achive 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 compliment the acoustic characteristics of the transducers, feeds 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 no-compromise, non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio stations, broadcast studios and editing suites—where nothing must ever go wrong.

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

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 & uper resistance to dust, smoke etc.
- Control room/phone matrix adds incredible tape monitoring, mixdown 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 sub-group 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 108 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, miking 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 overload and signal present indicators.
- Rear panel features include insert points and 1/4-inch /XLR connectors on every channel, as well as RCA tape inputs/outputs.
- 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 cascaded decks - whether you have one deck or sixteen (up to 128 tracks!)
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48KHz. The frequency response is flat from 20Hz to 20KHz while the dynamic range exceeds 92dB.
- Execute seamless Punch-ins and Punch- outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks 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 RCC-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 autolocation.

- 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 autolocation 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 bal/unbal 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. This 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 nitrite rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected indicators. 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 nitrite 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 3/4" polymide 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 radiused front baffle design.

PBM 6.5 II

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

PBM 8 II

- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors and components available.
- Full cross-braced matrix 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

HHB
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 MBit RAM buffer. • Instant Start & Edit • 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 setup 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—indispensible for realistic piano sounds, giving you all the capability 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.

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

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 your 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.

VS-880
Digital Studio Workstation

The VS-880 is an integrated digital recorder, mixer, editor and fx processor in one. A complete digital audio 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 50 total track minutes or 1.6 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 99 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 function 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 100 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 + 6 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 multi-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 turns 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 Mach ne Control.
- You can record mixer settings and fader movements into a MIDI sequencer. Playing the sequence back, in sync with the VS-880, affords full, automated mix-down capabilities. Has a MIDI Clock--dedicated track independent of the main tracks, so you can even sync to a non-MTC/MMC compatible sequencer. Stack two VS-880s via MIDI and you'll get a digital recording system with 16 discrete tracks and as many as 128 total tracks.

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SSHRD-1
Hard Disk Recorder/ Editor

A professional Multitrack Digital Audio Workstation for the PC, the SSHDR1 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 SSHDR1 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 SSHDR1 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 SSHDR1 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 analogue, digital or video tape recorders and even chase timecode when varispeed 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 displays 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).
- Real-time 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 ADR).
- Normalize process to 0dB.
- Stereo link tool for stereo editing.
- Varispeed ±10%.
- Nudge 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/Compute 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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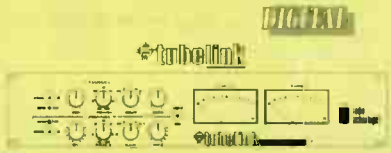

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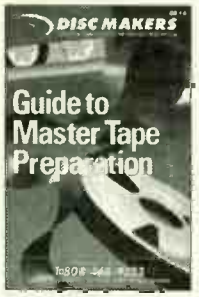

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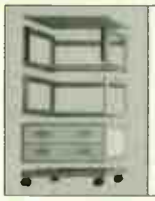

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- Is the price too LOW? If a deal seems too good to be true, it probably is.
- Consider the quality of the company's clientele--does it work with professionals--names you recognize? Ask for references.
- Consider how knowledgeable & helpful the company's staff is on the phone: do they know the music business? Are they interested in your project's potential?

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World Radio History

Freelance? *Anything But*

The tax rules for freelance audio pros and the people who hire them must be followed

BY MARTIN POLON

In the recording studio, many session engineers, maintenance technicians, and even chief engineers have gone from being full-time employees to being independent contractors. These individuals are paid at an hourly rate that they negotiate, have no benefits or permanence, and receive their compensation with zero deductions on an IRS form 1099. These freelance audio workers have the responsibility for paying their own withholding taxes and buying their own health plan, pensions, and short-term and long-term disability insurance.

On the other hand, these independent workers can deduct from their taxes all of their job-related expenses. The deduction for a home office becomes possible when there is not a regular and permanent work venue. So does the practice of cost accounting one's tools, test equipment, audio equipment, computers, software, books, professional magazines, telephone expenses, membership to the AES, the use of AOL and/or CompuServe, etc. Vehicles can be leased for professional use, and travel/attendance at important industry trade shows is another category of deductibility. Of course, all of these expenses of doing business have to be validated for the purposes of income tax liability and must pass the potential scrutiny of State and Federal tax examiners. Practically none of these expenses can be deducted by permanent employees, so there are plusses and minuses for each kind of employment.

Recently, a court decision by the United States Court of Appeals for the Ninth Circuit, in a case involving Microsoft, practically speaking further restricted the freedom of relationship between independent contractors and their employers as technical workers. In effect, the court said that certain workers whose relationship to their contractee covers a long term of employment, may be considered to be regular employees by the government and the company employing them is liable for their taxes and other deductions, plus the workers may be eligible for the same benefits as regular permanent employees.

Now, there are several points to consider in the matter of so-called temporary workers vis-a-vis audio employment in the recording industry and other audio-related jobs.

1. The basic issue, whether it is technically related employment in the computer industry or in the audio industry, is that the length and breadth of the relationship is the most important of the 20 some-odd rules that the IRS applies to "test" the connection of an independent contractor and their contractee. So if an audio freelancer works for a half-dozen studios on a rotating basis, with other work relationships as they become available, there are no problems or liability for either party.

2. Even if a relationship is longer than short term, say several months to build and wire several new studio facilities, the relationship would probably pass the IRS tests. That is because the independent audio contractor is providing a specific service, much as a mason does when building a series of walled offices for a company converting a floor from manufacturing to administration. Part of the measure that the IRS takes is whether the audio contractor or freelancer is indeed independent or if the contractee/employer makes all of the decisions concerning the contract worker and what he or she does on a continuing basis. But, it is important to remember that Section #1706 of the Internal Revenue Code, which applies to computer programmers, engineers, and other technical service workers, does measure the regularity of the employee by the test of attendance at the same job site day after day after day.

What the government wants to stop is a relationship where the employer no longer has to carry the employee on the books for tax purposes, while gaining the same benefit as though the worker was permanently employed. The recording industry is the kind of business where the onus of maintaining a complete withholding tax bookkeeping system plus the expense of hiring a bookkeeper and of paying quarterly withholding payments to the IRS can be very punishing to a small business with a variable cash flow! The employee also benefits by receiving a larger sum for the same work performed and, ultimately, by paying a smaller amount of taxes due to the many deductions accorded to he or she working independently.

At present, the IRS has not been significantly enforcing these rules in the recording/audio industry. However, those analysts who attend professional meetings of Federal and State tax regulators report that the electronic entertainment industry may well be the next area for such tax scrutiny. If studios are caught failing the IRS relationship tests, the government could well demand back taxes for the entire length of the relationship and the appropriate penalties as mandated by law. For the freelancer, the basis of a year or more's deductions could be thrown out; thus obviating back taxes and surcharges.

The bottom line is that it is very important to both studios/audio employers and their employees to maintain permanent technical employment as just that, and not try to create an artificial relationship to escape certain burdens. The power of the IRS to impose penalties in these cases is so substantial that very large computer companies will no longer go to independent outside contractors; choosing instead to use "temp" agencies to act as middlemen, so that they will not be punished. EQ

World Radio History

ACROSS THE BOARD

continued from page 162

IN MY TRUNK

Oh, if you remember from last year, I made six green CDs that I put into the CD changer in the trunk of my car. They have been there for over two years now, and playing just fine. I checked the error rate on them just for kicks. I made a seventh CD that has been stored in its CD case in my studio for the same amount of time. CD Number Seven showed an error rate of 12 to 18 Blers per second. All six of the CDs from my trunk now show errors of 2000 to 3000 Blers per second with interpolations and uncorrectable errors subsequent to de-interleave. In other words, the trunk of your car is probably not the best place for long-term storage of master CD-Rs.

By the way, I didn't eat the Twinkie from my storage shed. I did feed it to my dog and have been watching him closely for the last week. He seems OK, but I often find him sneaking around my computer. I personally won't eat a Twinkie that is more than 10 years old — unless I'm really hungry or unknowingly buy one at the snack bar at the NAMM show. EQ

MAINTENANCE

continued from page 143

minimal use of EQ during the tracking stage will help keep things simple until mix time. If you start out with bright tracks, every added track has to compete, and not every track needs all the fidelity technology has to offer. Too often we reach for additive EQ when a little subtraction will do a better job.

One of many decisions during the mix and mastering phases will be whether or not to make your mix spectrally competitive with the current market norm. Reissue specialists also face that challenge. Danny's treatment of the Temptations *Anthology* is infinitely more palatable than pre-Polygram Motown re-releases.

When making critical EQ decisions, try to do so with fresh ears. (First impressions are key.) Allowing full bandwidth to come through may seem great at first (listen to all that detail), but your ears either quickly get used to it (and want more) or become fatigued. The excess brightness still prevalent in '90s mixes is the result of compensating for bad speakers and, uh, left-over cocaine abuse from the '80s.

So, what does "dead" technology teach us? Well, it's sort of like a mix between *The Wizard of* Oz and *Star Wars.* Dorothy always had the power to leave Oz and, upon returning to Kansas, realized she never had to leave her own backyard. Obi Wan told Luke to use "The Force." The summary: We've always had Hi-Fidelity, we just didn't always have the equipment to play it back.

DOWNLOAD SIDEBAR

You can download soundfiles via Craig Anderton's Sound, Stage and Studio on AOL (keyword: SSS, then look for the *EQ* On-line button). From my own site (http://www.users.interport.net/~edaudio/), click on THE DIRECTORY, then press the RCA RED SEAL (with Nipper!) for this article. Access to soundfiles appears in the paragraph heading, "...Gimme Some Music."

Incidentally, congratulations to RealAudio on their improved algorithm options. While originally for voice only, they now have less aggressive data compression that is actually good enough to hear obvious spectral differences. A 97k real-audio file is available in addition to the full bandwidth mono WAV files. EQ

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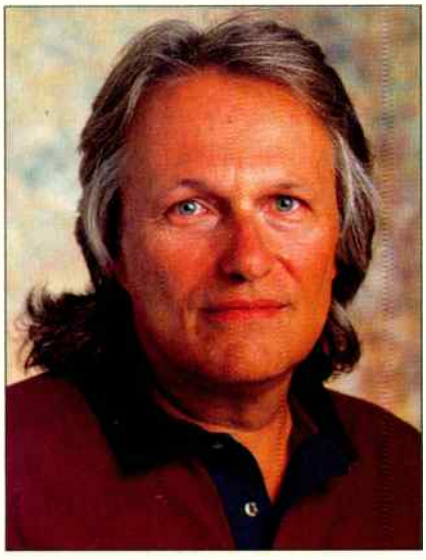

I have started working on the Roger Nichols Plug-In for Pro Tools. The code that I was writing took up about 30 pages of source code and needed about half-a-gazillion bytes of memory to run. It contained some of the same routines that were in Wendel (the sampling drum machine used on *Gaucho*). I thought that the original version took a lot less code and memory to perform the same task. I decided to check it out.

I dug into my storage shed where I have kept everything I ever owned. I still have the 6-inch reflector telescope that I built in the summer of 1956. I found a box of canceled checks from 1964. I guess I went in too deep. I was getting closer, I found a pair of speaker cabinets I built from JBL blueprints in 1972. Nice three-way systems the size of a VW bug. I finally found what I was looking for: my first computer from 1976. A 1.8 MHz 8080-based computer with 64-character-by-16-line, text-only display. I found the floppy disk with my original program on it, and the printer that whipped along at a blinding 30 characters per second. I also stumbled on the mother lode! Sitting right there where I left them was a 20-year-old carton of Hostess Twinkies, still sealed in their original wrappers. All of the preservatives had kept them in better condition that my 8-inch floppy disks.

I opened a package and broke open a Twinkie. The creamy white center was bigger than a Quarter. It felt much more substantial than the Twinkies of today. I remembered the good old days when Twinkies were the staple of any late-night programmer's diet. Only last week I bit into a Twinkie (it was forced upon me by my daughter) and couldn't even find the cream-filled center.

I think that studio-maintenance personnel fit into the same category as computer programmers. A nerd of the nerdiest kind. The obligatory pocket protector, Coke-bottle-bottom glasses, pizza-stained shirt, and overflowing trashcan. A long burned-out desk lamp, a glaring computer monitor radiating green text at bloodshot eyes, and a printer ribbon that was so over-used that you couldn't read what was printed on the back side of used computer forms. Floppy disks used for drink coasters. A fast-food drink cup that had exceeded its half life, refilled with Jolt Cola and was leaking from the bottom.

Yes, this could be why the quality of computer software and studio maintenance has become sloppier. The Twinkies on which they have depended on for sustenance for a generation are inferior. Would you expect your dog to fetch the paper or wash your car if you rewarded him with substandard treats? I think not.

BLER

No, it is not cold outside. Bler stands for the raw Block Error Rate that occurs while a CD player or CD-ROM drive tries to read a CD. I bring this up because you may be creating CDs that are much worse than you think.

Over the last year there has been plenty of press about the differences between pthalocyanine (gold-colored) and cyanine (green-colored) CD-Rs. As the dust settled, most users seem to think that the gold discs are safer for storing precious masters, and, with the correct recorder and storage conditions, this may be correct. What nobody seemed to pay much attention to was the fact that the recorder adjusts its laser power to be optimum for recording the CD-R within parameters set by the recorder manufacturer. The range and incremental adjustments required for green discs is different than that required for gold discs.

As a point of reference, I used the Yamaha CDR-100 4X CD-R recorder to record various brands of blank media. This Yamaha drive and its 2X little brother, the CDR-102, seem to be in the most widespread use. The recorded discs were then checked on the Stage Tech EC-2 CD error checker. When gold discs were cut at any speed, 1X, 2X, or 4X, the Bler error rates were between 200 and 220 errors per second. These errors were correctable at this level and did not generate any decoding errors further down the line, but they were right at the level where most CD plants and Warner Bros. Records start rejecting masters. The green CDs on the same recorder reported Bler error rates of only 15 to 20 errors per second. This is 10 times better than that shown with the gold CDs. I repeated this test on four different record machines and six different sources of blank CD-Rs with consistent results.

The gold discs, however, showed the same low-error rates when recorded on a Kodak recorder, so it is not the fault of the disc or the recorder, it is the combination that you have to watch out for.

The bottom line is that you should use the discs that your drive manufacturer suggests to get the best results. As for the Yamaha drive, the green cyanine-based discs that are available from 3M, Sony, TDK and others work out much better than the gold pthalocyanine discs from Kodak, Apogee, Quantegy, and BASF.

I am planning a comprehensive report on which blanks work best with which drives at what recording speeds. It looks to be a very interesting adventure.

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World Radio History

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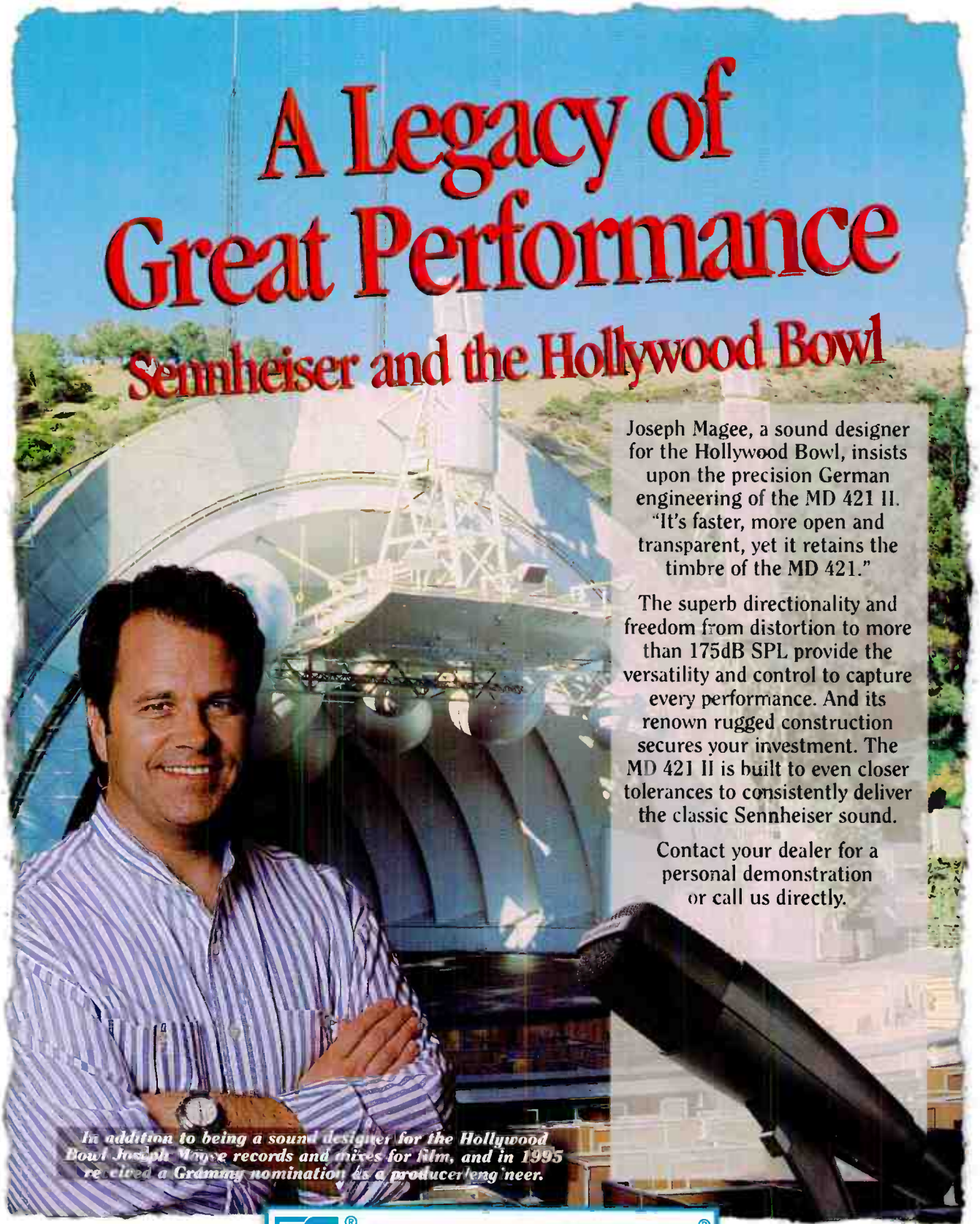

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In addition to being a sound designer for the Hollywood Bowl Joseph Magee records and mixes for film, and in 1995 received a Grammy nomination as a producer/engineer.

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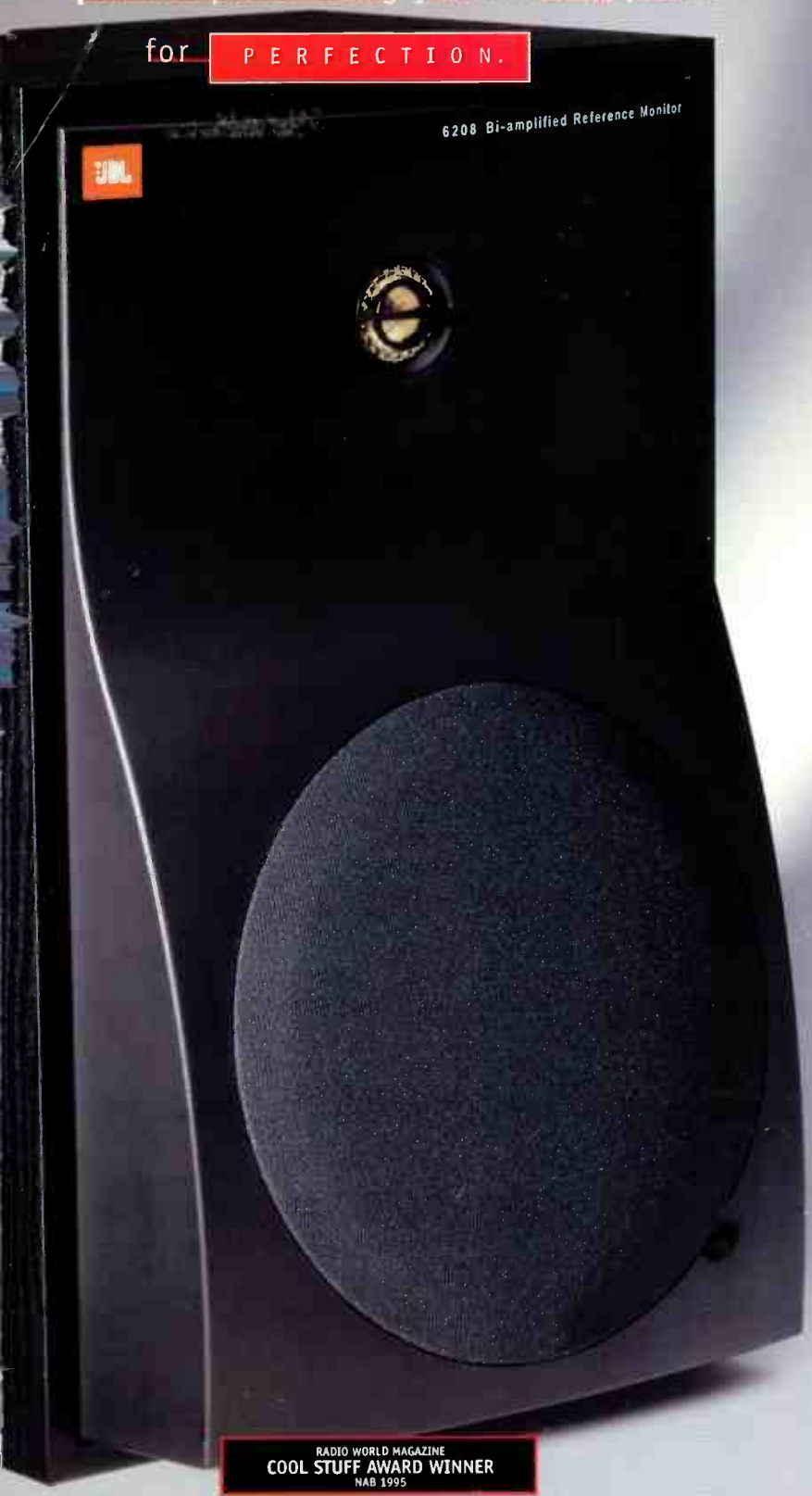

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