

CREATE YOUR SPACE



The Alesis MidiVerb 4 is the best solution for full-featured, completely programmable reverb and multieffects. Its algorithms for reverb, chorus, flange, delay, rotary speaker simulation and special effects are beyond compare. It offers up to three great-sounding effects at once, and lets you change programs and parameters in real time using MIDI controllers like foot pedals or keyboards. Its incredible sonic fidelity comes from 18-bit digital converters, a 24-bit internal DSP and a professional 48kHz sampling rate.

But the key to MidiVerb 4's power is that every program offers dozens of detailed parameters that let you create the perfect effect for every environment. And since it's also easy to use and surprisingly affordable, MidiVerb 4 is the obvious choice for musicians and engineers looking to expand their effects processing horizons.

Start creating your space with the MidiVerb 4. It's at your Authorized Alesis Dealer now.

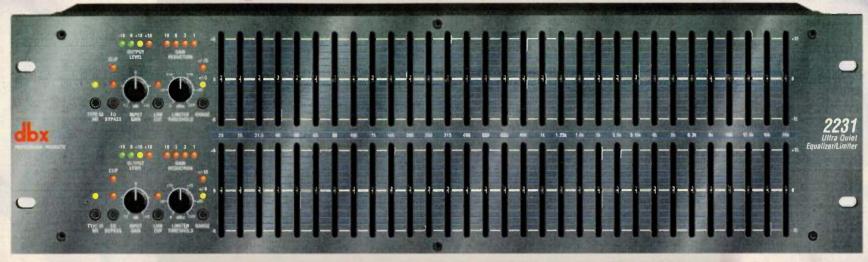
For more information on the MidiVerb 4, visit your Authorized Alesis Dealer or call 800-5-ALESIS.

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ALESIS

For 20 years dbx has been bringing you the finest equalizers, and revolutionary noise reduction



It's amazing. One little button. It has so much effect. The Type III Noise

Reduction is an entirely new concept... virtually instantaneous encode decode within the circuitry of the box. We started out to build the finest EO's possible, boxes with

the heritage and performance to rival our famous 30 Series EO's. And to no one's surprise they came out awfully darn good. (Ask to see the Audio Precision plots compared

to the competition.) But then, Roger (our chief engineer, a nice guy, as far as engineers go) got the crazy idea of putting this new noise reduction stuff in the box. We listened to it and were amazed. The EQ's sounded great without it but with it the performance was nothing short of incredible. Check it out yourself and see.

STIME OF

But hey, Roger wasn't about to stop there. Peak PlusTM Limiter. Who knows more about limiting than the folks at dbx; nobody... that's who. So when the guys were developing this new series of EQ's they wanted something that would be unique to







20 Series EQ's with dbx Type IIITM Noise Reduction Oh... and PeakPlusTM limiting too!

these EO's. That's when Roger got another one of his bright ideas and said "I bet they'll work a lot better if there's a cool limiter built in." Next thing you know, all the guys are in the studio amazed at the new limiter Roger had designed specially for the 20 Series. Once again, hearing is believing... With a threshold range of Odbu to plus 20dbu, the PeakPlus™ limiter is designed to tame your program material from the subtlest nuances to the rowdiest hits. Also, the four stage LED ladder gives you a great visual indication as to what the limiter is doing.

20 Series EO's. You used to have to settle for second best in a reasonably priced EQ but not any more. With the new 20 Series from dbx Professional Products you get a great EO circuit, a graceful yet powerful limiter and the revolutionary new design

of the Type III Noise Reduction. Check out the dbx 20 Series graphic EQ's at your pro audio outfitter. You'll see, with the 20 Series

PROFESSIONAL PRODUCTS EQ's you get both MORE!!!

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CIRCLE 27 ON FREE INFO CARD

















ON THE COVER: Bob Rock sits in his Hawaii-based project studio.
Photo by Jim Ainge.

Producer Bob Rock gives the "Load" down on the recording of Metallica's latest disc, and gives a sneak peak at his still-in-progress Hawaiian project studio.

FOY'S BLUE RIBBON AWARDS

Straight from the floor of the 101st AES, EQ's editors hunted high and low for the best gear on the floor. Here's what we found.

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

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

What to Keep The new CS 800S uses metal (TO-3) power transistors, because plastic dévices just don't deliver equivalent thermal

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



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

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

With two variable-speed 32 CFM fans cooling hundreds of square inches of heat sink area, and metal (TO-

3) power devices (in the air stream), the CS 800S will play very loud for very long (years - not minutes or seconds).

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

1200 W 23.5 lbs.

Very carefully!

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

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



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



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

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

PENVEY





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Does MD = Magic Demo?

Then Hector La Torre (EQ's Overlord of Gear Reviews) asked me about reviewing a MiniDisc-based 4-track portable studio, I was less than thrilled. I'd heard MiniDisc (MD) when it first came out, and found it shrill and brittle. As for a studio-in-a-box, who would want to pay over \$1,000 for an MD-based version when you can get a decent cassette-based model for less than half that?

But hey, I'm a professional, so when the thing came I dutifully opened it up and took it for a spin. And what I heard, and saw, made me realize just how wrong I was.

Twenty years ago I paid \$1,000 for an unwieldy, lo-fi, reel-to-reel 4-track called the TEAC 3340. It needed an external mixer, and tape cost about \$25 for a whopping 24 minutes. But I endured the limitations and so did thousands of other people, because that machine put the project studio revolution on the map. The quality wasn't really good enough to master, but it was good enough for practice.

Years later, technology like MIDI, budget digital tape, and personal computer-based hard disk recording made the project studio a reality. Sure, the entry cost was a bit higher, but you could produce CD-quality work, and even make a gold or platinum record at home (as many have).

Well, it looks like the MD is going to cause another upheaval: now it's possible for almost anyone to have a studio capable of making master-quality recordings. Gone is the less-than-wonderful ATRAC data compression of yesteryear; the latest versions have evolved to the point where the sound is approaching DAT (and some people actually prefer the sound of data-compressed material). These new MD multitrack recorders can also provide the luxuries of digital gear — editing, playlists, bouncing forward, synchronization — and do it all on a medium more robust than tape, and even most removable disks.

I had a great time with my analog 4-track dinosaur, and learned a lot. But undermining my pro-studio aspirations were hiss, modulation noise, distortion, wow, flutter, and inflexible editing. MD finally brings the "home recordist" into project-studio territory, where with care you can actually make a sonically, and commercially, viable product in a truly budget studio. In fact, for many project-studio applications — broadcast, audio-for-video, and multimedia content creation — MD offers all the quality you can realistically use anyway, given that the playback medium will be inferior.

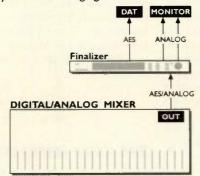
Yet there's another twist: high-end musicians are intrigued by these machines too. Let's face it, navigating through much of today's technology is like piloting a 747. A friend of mine has a world-class audio setup with Mac, Windows, and digital tape, but bought an MD 4-track so when he wanted to capture ideas quickly, he'd be "on the air" in 30 seconds or less. What's more, if he does capture that "magic demo" on the MD, he can bounce it over to his digital tape or computer without making the excuses he'd have to make with a cassette 4-track. Would a great vocal take sound better if it was recorded directly to computer or digital tape? Probably, although the difference is subtle at best. Will any radio station call you up and say, "We love your CD and were going to play it, but we think your really great vocal was recorded on MD, so forget it!"? I don't think so.

It used to be that only the pros had pro sound, but each successive generation of recording technology has enabled more people to enter the world of the studio. If you're a beginner just starting out with an MD and recording your first song, welcome. You've never been able to get more for less. And if you're an experienced pro using MD as a sketchpad, you're in for a treat. Just remember that when you get that "magic take," don't worry about recapturing it on the multitrack — just bounce it over. If you don't tell, I won't.

Craig Anderton
Technology Editor



Want your mixes to deliver the punch and clarity of the industry heavyweights? Now you can... thanks to the FinalizerTM, 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!

The Finalizer's 'Wizard' function easily finds the optimum setting for your mix: Simply enter the type of music you are mixing and to what extent you want it processed... and you are done! The more experienced user may "tweak" the signal path extensively, with over 75 parameters to choose from. You will also find additional signal analysis tools including a Phase Correlation Meter, Peak-Hold Meter, Level Flow Meters, and a Digital Format Analyzer.

We've even thrown in a Calibration Tone Generator. All of the Finalizer's functions are easily monitored on the graphic LCD and on the seven precision LED meters.

Now even your demos will sound like a CD. You can simultaneously:

Convert It:	20 Bit precision A/D and D/A Convertors
Shape It:	Five band 24 Bit Parametric Equalizer
Enhance It:	Choose between De-Essing, Stereo
	Adjust or the Digital Radiance
	Generator™
Normalize It:	Real-time Gain Maximizer
Expand It:	Variable Slope Multiband Expander
Squeeze It:	Multi-band Compressor
Trim It:	Variable Ceiling Limiter prevents overloads
Fade It:	Manual or Auto Fade Tool
Dither It:	To maintain the highest resolutions on
	the digital AES/EBU and S/PDIF outputs

Naturally, the Finalizer fully lives up to TC's twenty year reputation for sound quality, specifications and construction.

Try it - you'll be knocked out by what the Finalizer will do for your mix. Call I-800-798-4546 for the location of a TC dealer near you.

Wizard | Finalizer





NASHVILLE '96 & ESCAPE TO L.A.: The Nashville vs. Los Angeles debates continue to rage on.

NASHVILLE '96

Things are moving so fast, it's frightening. Five years ago, who would have imagined you could have 32 tracks of digital audio sequencing and effects processing from a company like [Steinberg| Cubase in a single computer, or that Gibson would make an affordable beautiful little guitar with the sound of the Nighthawk, or that O.J. Simpson would...well, you know. Al Kooper's comments regarding Nashville's music stores, however, show that he is still living in the past. Now Al, no insult intended, you know I love ya, and you can bump my bumper with your four blondes next to you, like you used to do in L.A., down here in Nashville any time you want to.

The best music stores in Nashville. like Sam's Music and Corner Music. among others, are state-of-the-art. What used to be state-of-the-art in music stores was a certain way of doing business epitomized by a certain L.A. megastore and a certain New York megastore, which I won't name, but I did tens of thousands of dollars worth of business with these stores during my Fleetwood Mac and solo years. You almost had to take a tranquilizer before you went into these places, the pressure was so high. If you were fairly well-known and suspected of having money, as I was at the time, it was nothing but shmooze, shmooze, shmooze, yack, yack, yack — "Bob, you gotta look at the new whosiz. It'll blow your mind. Bob, you gotta have the new Johnson XXY watchyamacallit.

It's awesome...and. by the way, what's Stevie Nicks really like?"

Now, if Al Kooper likes this kind of thing in 1996, he's welcome to it, but to me state-of-the-art these days is a place like Sam's in Nashville. They know their stuff and they have the best stuff, but there's no high pressure, show-biz, buttering you up; they don't expect you to drop a grand the minute you walk in. In Nashville, 1996-97 means low pressure, free to wander like a kid in a candy store. Al, are you just mad because people in Nashville music stores don't ask for your autograph?

Bob Welch
Former solo artist on
Capitol and RCA
Ex-Fleetwood Mac member

ESCAPE TO L.A.

Ahh Nashville...I know it well. I lived there for six years, got my music business degree at Belmont College, and made many friends there. The musicians are wonderfully talented and a genuine bunch of good-hearted folk. But I think a comment in the October issue by Dino Elefante in the "Eastward Ho" article says it best for me: "There is tremendous growth in Nashville right now, and a lot of people are coming here expecting to find work. But unless people bring work with them - which creates opportunity for the entire community - then it just makes life harder for the people already here in good standing."

I moved from Nashville to Los Angeles, via Sacramento, in 1991 because I wasn't getting the work I wanted. I loved Nashville, but couldn't stay there. Now I'm still in Los Angeles and I love it. I have a wife and two kids and I am definitely the family man. I'm a composer and pop songwriter/producer. Since being in California, I've recorded with The Seattle Symphony, many wonderful singers in San Francisco and Los Angeles, written music for movie trailers, television shows, and network promos, worked with several artists developing recording projects, and recently mixed a short feature film (very exciting!!). It seems to me that Nashville is where you go when you've already made the "Big Time" and need a place to chill out...and bring all of your clients with you!

I'm happy for the people that have moved to Nashville and are happy there. It truly is a special town and I cherish the people and the experiences that I've known there. However, I'm tired of the media's seemingly biased comparison between Nashville and L.A. and how one city must be better or worse than the other. I think each city has its merits depending on what you're looking for — and I know what I was looking for in Los Angeles.

Please stop the L.A. bashing. I like it here!

Mark Haffner Mark Haffner Music Los Angeles, CA

THE HARD (DISK) WAY

I have to thank you for an outstanding magazine, and, as I sit here in the wee hours with computer guts, tools, and manuals all around me, especially for the informative (and timely I might add) article in the August EQ by David Miles Huber entitled "Life in the Fast Lane." The explanation of the E-IDE hard-disk standard was clear and concise and came just as I was in the midst of a drive crash/upgrade of my trusty "old" 486/50, as well as sending my newer Windows 95-based Pentium system back due to the instability of that installation.

The proliferation of lower-cost, high-capacity media has been a definite blessing, but the line between being able to just figure out how to use the hardware and having a complete technical knowledge of it is ever blurring. EQ does

WANTED

Self-contained digital recorder/mixer combo as easy to use and durable as my TASCAM Portastudio. No hard disk systems, please! Allan 646-3035.

FOR SAV

Hard Disk Recording Lystem. Like new. Good but difficult to operate. If you're a computer programmer this is for you. Mark 565-5791.

* * FOR SALE *

Yamaha digital recorder. No jogo huttle wheel, no digital out, no sold or mute and slow drive mechanism of enough AUXes. Will sell cheap. Make an offer, Call Dick after 5 pm – 555,0154

Established working party rock band seeks digital multitrack recording system with 2 AUX sends and 2 stereo AUX returns, 4 XLR mic inputs, channel inserts and individual track outputs — cue outputs are a real plus. Call Gasm Sparks 454-3651.

FOR SALE

ADAT and Mackie 8-Bus, Must sell. Looking to buy an integrated system that takes up less space and easier of

WANTED

Digital multitrack system with jog / shuttle wheel for easy editing. Mickey 444-3169.

BODY PIERCING FOR BANDS

If you've got the flesh, we've got the tools. Call INTooU 258-9631.

WANTED

ADAT transports. We can use all w can get. DMR Repair Services 767-01

Smashed my hard disk records. Too many menus made me gr mad. Looking for artist who can use it in an abstract sculpture, or sea captain looking for anchor. Call Trep. 457-9851.

FOR SAL

Yamaha MT8X, I thought it was a Portastudio. It's not. Nover was. Never will be. Best offer takes. Gary 543-1010.

ATTENTION COLLECTORS

Priceless first dition TASCAM Portastudio. This is the multitrack recorder that revolutionized the music business and changed the face or recording. Seri I number 00001.

NEEDED

Stereo digital outputs on a low cost digital 4-track for making digital masters on DAT. Call Ken 799-0025.

ALTERNATIVE BANDS?

Looking for a record deal? Send your demo tapes for consideration. Eddy 445-8870.

Web page design & hosting for your band. Cheap. Call Scott 255-5569.

Band looking for drummer. We've been through five. Can you hang for more than a week? Roger 626-3030.

* * FOR SALE * *

Mirror ball, bell bottoms, platform shoes and leisure suits. Perfect for retro bands. Call Slick 247-8414.

WANTED

Digital recording system that's easy to use and uses low cost removable MiniDiscs, Call Tina 555-2598.

There's only on company that make Portastudios. Out the details via fax 800-827-2268 ex 8320.

ented. Komod Dragon or other Motor lizard for band mascot at live show. Let Go-T 555-1952. Female country vocalist wanted by songwriter to develop hit records. Have full arsenal of TASCAM recording open. Call Willie 236-6665.

 Female lead, rhythm, bass guitarist and drummer wanted. Must be able to write music and be willing to tour. Recording experience a real plus. Janis 592 (2005).

. . WANTED!! . .

High Performance Digital Recording System that costs less than \$1500 AND uses a non-destructive editing process — must be easy to use. Karl 778-1321.

* GUITAR LESSONS *

earn those licks. Do five takes et track on a Digital Portastudio, eter 256-5584.

5 TAKES PER TRACK?

Plus capability up to 5 song sectors, 20 indexes per song and bounce forward? Need advanced editing features! Traditional Portastudio ease-of-use preferred. Call Eduardo 777-1019

Spikel Certain Just bought a digital rortastudio. Can't wait to lay down racks. Yes. You can do your lead b' times and we'll still be able to use he first one — cause you know it' always your best.

DRUMMER WANTED

by signed band. Send tape, photo & bio. POB 2928, Newport, CA 92659.

Desperatoly Seeking Digital Simplicity.
Margle 251-4292

Looking for a digital 4-track XLR inputs and mid range sweep EQ. Must be built by the company that invented cost effective multitrack recording. No imitators or motorcycle manufacturers buck 858-6651.

USED GUITAR STRINGS

If you want them, I've got them. Some broken, some used by the biggest stars. Electronic and acoustic.Good proces. 555-0973 - Call Razor.

WANTED

Digital recording system that is selfcontained and offers five takes per track. Must have random access and instant locate capabilities. Will pa cash 588-7462.

MAKE A LOTTA NOISE •

Huge rehearsal hall for rent. Open 24 hours. Call Max dB at 555-8711.

NEEDED

Sm., band on the rise looking for top sound echnicians. No newcomers to the biz, op dollar paid. Sid, 556-2890.

EQUILMENT FOR RENT •

Top of the lift recording equipment. All TASCAM components. We deliver. Rent per day, whek or month. Call us 24 hr. 556-8293.

Need a MiniDisc digital recording system that does more. Will pay a little more for the extra features. Must have digital out, killer-mid-range sweep. Con Needs 389-9511.

Techno Rap Band Seeks Digital Recorder that does everything: MTC or MIDI clock, editing effects like bounce forward, cut, copy, move. Undo capability a must. Ask for Father Flack 192,4775.

WARNING!

Not all MiniDisc systems are created equal. Don't settle for cheap imitations. Get the new TASCAM 564 Portastudio. Facts via fax. Call 1-800-827-2268. No one's ever sorry for buying the best.

Wanted By Musicians Everywhere.

The Digital Portastudio.

It's the real thing. A Portastudio. Best part is, this one's digital. And who else could deliver the best MiniDisc multitrack digital recorder? TASCAM — the only company that makes Portastudios. With more than 15 years of designing and building the best recording products, TASCAM knows recording better than anyone. The 564 Digital ASCAM Portastudio has everything you want powerful features, impressive flexibility and great sound. And at only \$1499, it's worth every penny. Don't settle for anything less - because your next demo may end up a master! Find out what the 564 can do for you. Get the full Digital Portastudio story via fax by calling ASCAN 800-827-2268, request Take advantage of our experience. document number 8320.

CIRCLE 78 ON FREE INFO CARD

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RØDE. A Mic For All Seasons.

A great mic can make your track come alive. The wrong one can put it to sleep forever. You've heard that every mic has its day. But you haven't the time or money to try every one. What you really want is a great mic that shines in multiple situations. A mic you can trust.

You want the NT2.

Hand made in Australia, it's just right for your lead and background vocals. Fabulous on your acoustic guitar. Perfect on the drum overheads. Great on those wind instrument overdubs. In fact, this mic will deliver the results you need on just about any source material you throw at it.

The NT2 Large Diaphragm Condenser Microphone features:

- Large Capsule with Gold-Plated Membranes
- Low Noise, Transformerless Circuitry
- True Condenser Elements
- Gold Plated Output Connector and Internal Head Pins
- Omni and Cardioid Polar Patterns
- Full Frequency Response
- Highpass Filter
- -10dB Pad
- Flight Case, Shockmount, and Windscreen

Finally an affordable, multipurpose, professional recording microphone that provides outstanding performance in a variety of uses.

Get the NT2 and discover how comforting it is to have a great mic at hand whenever you call on it.

Fall, Winter, Spring or Summer... Vocals, winds, strings, or other...

The NT2 is truly a mic for all seasons.

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CIRCLE 30 ON FREE INFO CARD

RODE is a trademark of Free limin Electronics.

a fine job of helping to bring the blur back in focus.

I also enjoy very much articles such as the recent *Pet Sounds* and Beatles coverage. It shows us that there is no amount of technical wizardry that can ever replace raw talent and musicianship.

Keep up the good work.

Douglas Ottersberg Santa Fe, NM

DARWIN'S EVOLUTION

My name is Jake Smith, and I'm operating a micro-indie label in the Detroit area called Zahmbee-Karlt. I read the article that Craig Anderton wrote about the E-mu Darwin digital recorder in the October '96 issue. Man, it was fabulous. I also own an ADAT digital recorder and I am in the process of adding eight more tracks to my studio. So many products hit the market each year that it becomes mind blowing as to what will actually work with the components I already have. I had looked at Darwin before, but never really had a grasp as to its inter-

face with ADAT until I read that article. Thank you!!! The things Craig wrote about were very helpful as to how I'd go about using both technologies.

Jake Smith Zahmbee-Karlt Detroit, MI

SURF REPORT

[Editor's note: EQ's Web site is now up and running at www.eqmag.com. There you'll find an online version of our Recording and Sound Buyer's Guide, as well as various ways of contacting us. Here is one of the early messages we have received. Keep 'em coming...]

I love your magazine!!! You have a better grasp on what is really important to people involved in the music industry than most of your competition. I especially enjoy your reviews and have purchased many pieces of gear due to a favorable review.

Keep up the good work!

Barry Papina via EQ Web Site

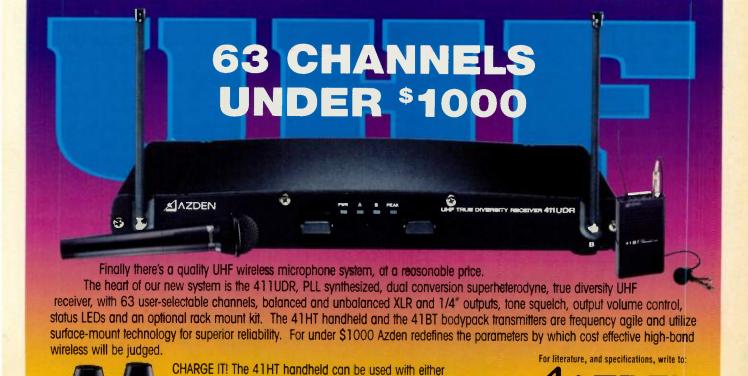
CORRECTIONS

In the Yamaha MD4 review that was featured in the October '96 issue, the term "Ministudio" was used. Ministudio is a registered trademark of TEAC. Also, a wrong phone number was given for Sennheiser in the MicroPhile that appeared in the November issue. The correct phone number is 860-434-9190.

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HEAVENLY NOISE

tool

Ahappen

otherwise there is a

strobing sound that

can be picked up by

the heads. It may also

be interference from a

video monitor (15.7

kHz). If the deck is rack-

mounted, try taking it out

I have been using a Denon DN-720R tape deck for playback using a Yamaha EMX 2300 mixer in a house-ofworship environment. The deck is split to channels 1 and 2 for split track. A noise problem has suddenly raised its ugly head after an estimated 50 hours of playtime. I clean the heads, pinch roller and capstan regularly; the bias is set at default levels. When a blank tape, or a recorded tape with soft acoustic guitar is played, a high frequency screech is plainly heard. It has been controlled somewhat by adjusting the high EQ to lowest levels; but this distorts the soundtracks. While using a blank tape, this noise tickles the LED meters to -20 dB. The only regular maintenance I haven't tried yet is demagnetizing the heads. I like this deck, but am relegated to using it as a record deck for now. Can you tell me what the problem might be and how to eliminate it?

a headphone jack, see if the noise occurs there with and without any line In or Out connections. If the unit has, and you are using, microphone inputs - even when not recording — disconnect the mics. Wiring can act like a noise antenna especially if the unit has an ineffective internal ground scheme. Finally, if the problem is a byproduct of recording, the deck may be picking up a high-frequency oscillation that is beating with the bias oscillator.

Eddie Ciletti Contributing Editor

GILDING THE TUBE

I read Eddie Ciletti's column and hope he can help with this question. I'm thinking of purchasing a Bellari ADB3 stereo tube direct box. I'm a producerlengineer who uses Neve VR, ADL, TubeTech, etc., but had never heard of Bellari until I saw ads in publications. What's your unbiased opinion of them? Michael Hammar via Internet

At he Bellari/Rolls box is good at At the Denativitions con a duality what it does. It is not of the quality (nor the price...) of the stuff you mentioned, but its mic and very high impedance instrument inputs - plus the ability to overdrive - are features that, for the price, you just can't beat. It was originally reviewed in the June '95 EO as the Rolls RP-220. Also check out Craig Anderton's full review of the Bellari ADB3 in the September '96 issue. Together those reviews should give you all the answers you need. [Bellari/Rolls: 801-263-9053.1

Many devices claim the vacuum tube as the key to their primary sound. but few put the tube where it belongs, at the front end. The Bellari is traditional in that it uses an input transformer and two stages of vacuum tubes at the front end. The output device is an op amp, but this is as it should be because its lowoutput impedance ensures consistent results regardless of the cable or destination device.

> Eddie Ciletti **Contributing Editor**

that are now constantly

BRAC." I sent them to

the authorized Alesis

service center, but

these problems still

exist. Could you

tell me what "CAL

and how I can fix

chewed up tapes

and sync'ing (with

means.

resultant

BRAC"

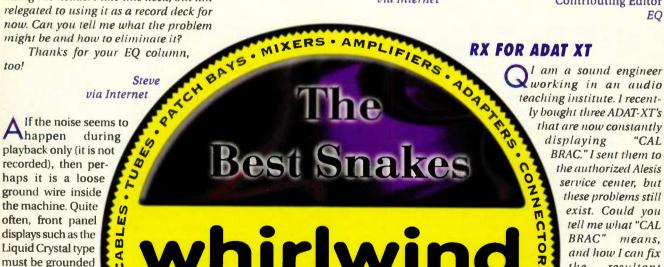
problems

the

BRC)?

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displaying

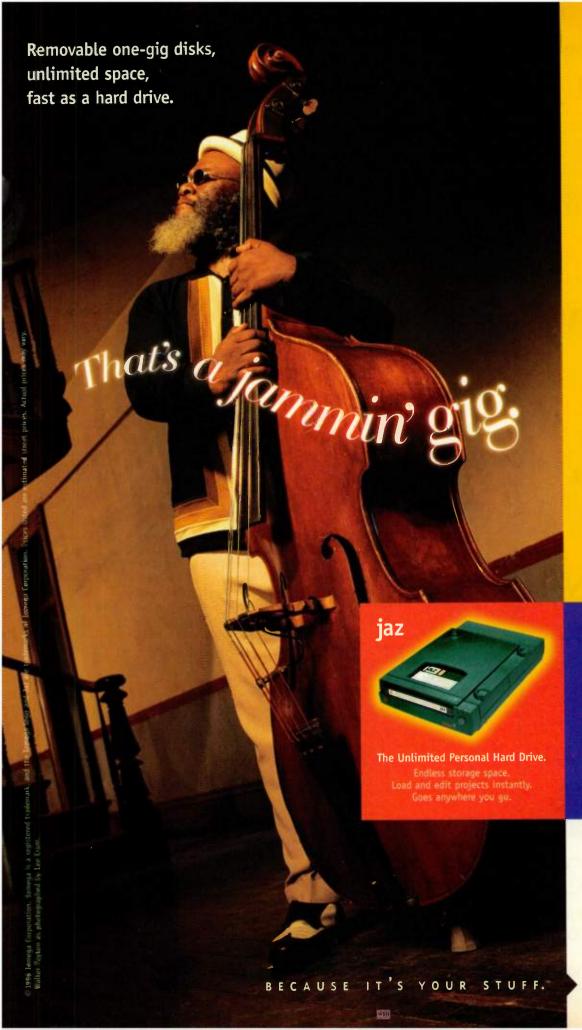


whirlwind

Kim Ocean Institute of Audio Technology Kuala Lumpur, Malaysia

In this particular case, "CAL BRAC" indicates that the brakes need to be recalibrated. To do so, power up the XT while

and/or moving it away from any noise sources. Open the LING RD case and tighten all circuit board screws paying particular attention to the front panel and any obvious ground wires. Also, if the machine has



For the nearest dealer, call: 888-2-IOMEGA, ext. j24 Or see us at: www.iomega.com



Laying down some silky-smooth tunes? Hey, the Jaz™ drive can handle it. Just connect it to your Mac, PC, or keyboard and its one-gig cartridges give you room for all your music stuff: demos, mixes, jam sessions. It's smokin' fast. And baby, the price tag won't leave you singing the blues.



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The Leader in Independent A&R





CIRCLE 79 ON FREE INFO CARD



holding down FF and REW. The display will indicate "CALIBRAT." Insert a previously formatted tape. The XT will then perform a 3-5 minute routine where it will partially eject the tape half way. Do not interrupt the process or be concerned. Once the XT has completed the calibration process, it should indicate "PASS" and return to normal operation mode. We recommend users recalibrate the brakes whenever receiving this message or every 250 hours. This information will be included in our Web site and is presently available through Technical Support.

If you have any future operational questions, please feel free to contact us by referring to Alesis Technical Support.

> Adam Brisben **Technical Support Alesis Studio Electronics**

SNAKES ALIVE!

Regarding ADAT ELCO cables: Where can I buy pro-quality ELCO 1/4-inch snakes? I've seen the ones retailers sell and they are not good! Are any made with Belden, Monster Cable, etc.? Michael Hammar

via Internet

I guess the problem with mail order is A the inability to sample the products. Are you at all inclined to build the cables yourself? Or are you judging the cable quality based on molded 1/4-inch plugs?

You should be most concerned with cable capacitance per foot. The lower values are better; 50 pF (pico farad) per foot is about nominal. If any cable beats this, you are headed in the right direction. In addition, I'm sure that some of EQ's advertisers can help you out, so perhaps one or more of them will respond to your problem and volunteer 1/4-inch snake types and retailers.

> **Eddie Ciletti Contributing Editor** EO

ADATS & POLARITY

My band is working on its CD using two Alesis ADATs and a BRC remote. The drum tracks have a few sonic glitches on an otherwise kicking performance, so to get rid of this noise I was hoping to transfer the tracks to my computer and use a digital editor to remove the junk. My original intention was to use the Alesis AI-1 to make the transfer; however, I have

heard from two sources, including Ed Ciletti's excellent ADAT XT review EO, May 1996], that, when using an original ADAT (what we use), the polarity will be reversed in the transfer. Precisely, what does this mean sonically and is there a workaround?

Jack Dalley via the Internet

The XT's output polarity is reversed Awith its predecessor, the Alesis ADAT "OF" (I call it the "Original Formula" ADAT). It does, however, maintain absolute polarity from input to output.

Keep in mind the following:

- 1. All machines normally maintain absolute phase/polarity from input to output.
- 2. A tape, previously recorded on an ADAT "OF," will have its polarity flipped on an ADAT XT. Therefore, a pair of tracks (i.e., stereo drum overhead mics) should not be split across two machines - even if they are of the same type - because there may be subtle phasing differences. If such a stereo pair is split between an ADAT OF and an XT, the two signals will be out of phase and will cancel when played in mono. The solution is to get both tracks on the same tape or have the ability to reverse polarity.
- 3. There should be no phase difference going from the ADAT to a workstation and back again.
- 4. Sounds, such as drums, must maintain absolute polarity. Kick drums blow, that is, push out air, not suck. (No drummer jokes, please.) A simple phase reversal switch (in the digital or analog domain) should solve the problem.

Eddie Ciletti Manhattan Sound Technicians NYC. NY

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02R Praise From Recording Pros.

Phil Ramone:

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

"The 02R is a serious invention, a real breakthrough in technology given its size and what it sole plays back warm-I'm very impressed."

Tom Juna:

President of DMP Records: Credits: DMP Big Band "Glenn Miller Project" and "Carved in Stone."

"We have been using the 02R to record and mix our new big band surround sound CD's. When you can do sonically. The con- consider all the power and flexibility you get for the money, it is truly amazing."

Roger Nichols:

Grammy award-winning recording engineer, producer of Steely Dan, Rikki Lee Jones, Rosanne Cash, etc.

"With the 02R's total reset of all parameters, I can automate levels, pan, EQ and external effects sends. After I've determined the set-up. I can hit GO and walk away to listen. The automation does it all.

Frank Filipetti:

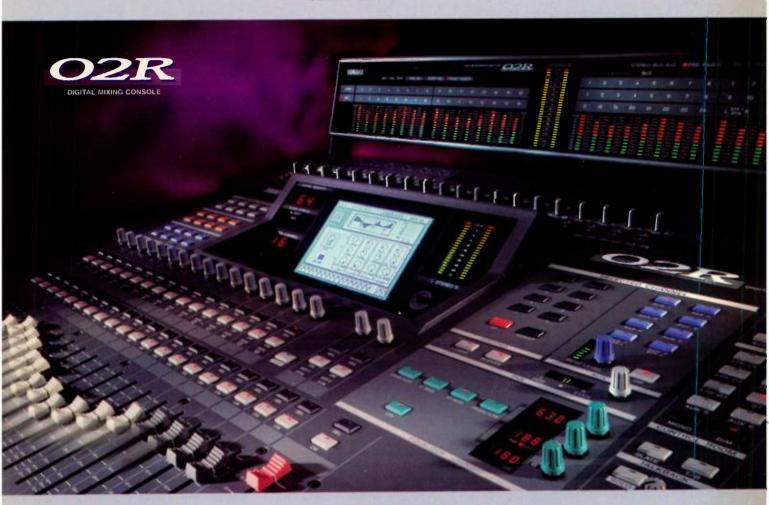
Recording engineer for James Taylor, Carly Simon, Marc Cohn, and others.

"I really like the A/D converters on the O2R. 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).





The Yamaha 02R Digital Recording Console is a breakthrough product at a breakthrough price. For less than \$10,000, 02R is the only recording system that gives you all of these features:

- · 44 Channels; digital I/O for ADAT, Tascam and AES/EBU products
- · Automation and instant recall of ALL mix settings
- Integrated dynamics and effects processors





The Yamaha 03D, available in the spring of 1997, provides all of the 02R's features in a 26 input package with a smaller footprint and a smaller priceless than \$4000. The 03D also gives you digital aux sends, surround sound, and control of external digital products-like hard disk recorders- directly from the console.



©1996 Yamaha Corporation of America, Pro Audio Products, (800) 937-7171 Ext. 650 or visit us at www.yamaha.com. P.O. Box 6600, Buena Park, CA 90622. Yamaha Canada Music Ltd., 135 Milner Avenue, Scarborough, Ontario M1S 3Ri (416) 298-1311.

REALITY FOR \$1500 A PAIR. INTRODUCING

f 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,



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

biamplified HR824 is the most accurate near-field monitor available. So accurate that it essentially

HR HIGH RESOLUTION has no SERIES "sound"

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.

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.

SCIENCE, NO 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



IEC power cord face downward so that the speaker can be placed close to rear wall surfaces. 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.

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



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

accuracy that simply can't be achieved with passive speakers using external amplifiers. There are many reasons.

First, the HR824's FR Series 150-watt bass amplifier is directly coupled in a servo loop to the 8.75inch 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, acousticinsulated 6.5-inch passive drivers. While typical, undersized ports cause vent noise, power compression and low frequency distortion, our ultrarigid drivers eliminate these problems and couple much more

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 airdisplaced 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

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



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

The High Resolution Film at II

transitional wave guide. unavailable.

"boxiness" is eliminated.

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

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



quencies. Both make

high-speed, latch-proof Fast Recovery design using extremely low negative feedback.

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

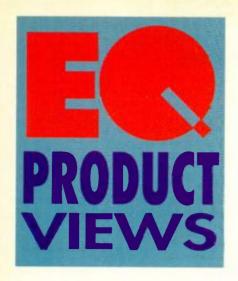
the HR824's \$1498/pair price* AND its accuracy.



*\$1498 suggested U.S. retail price per pair. © 1996 Mackie Designs Inc. All rights reserved.

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DARWINIAN

ith it's proprietary handmade capsule element, Empyrean Inc.'s CM3 tube microphone is a design realized through the evolution of microphone technology. Each capsule features three micron, gold sputtered, age-resistant mylar (with a 1.5 micro upgrade available), Teflon-jacketed sil-



ver bearing wire, point-to-point soldering, polypropylene output capacitors, metal film resistors, and a hand-selected 6072 vacuum tube. The fully regulated power supply allows for continuously variable patterns from omnidirectional to bidirectional. Empyrean also offers a two-year warranty for parts and service under normal operating conditions. Price is \$3000. For more information, contact Empyrean Inc., P.O. Box 884, Mechanicsburg, PA 17055. Tel: 717-691-1152. E-mail: empyreanmics@earthlink.net. Circle EQ free lit. #101.



GET IN AT GROUND LEVEL

-mu Systems, Inc.'s e6400 is the most recent professional sampling synthesizer in the E4X family. The e6400 incorporates the same sampling and synthesis engine as the E4X and E4XTurbo into its design and it also allows you to add hardware features and upgrades as your budget allows. E-mu's Digital Modular Synthesis is at the heart of the system, offering synthesis that provides 21 Z-Plane filter types, 32-voice layering, 128-voice cross switching or fading, and numerous patch cords that enable over 50 different synthesis destinations that can be assigned

to any of the unit's 58 modulation sources. Retail price is \$2795. For more details, contact E-mu Systems, Inc., PO Box 660015, Scotts Valley, CA 95067. Web: www.emu.com. Tel: 408-438-1921. Circle EQ free lit. #102.

LEAVE IT TO NEVE

esigned to emulate Rupert Neve's legendary 2254 compressor-limiter of the '70s, AMEK's new System 9098 dual-compressor limiter features a pure analog signal path enhanced by a digital control system. The System 9098's digital controls give you the ability to precisely set parameters each time the unit is used. The limiter-compressor also includes an Ambience control that allows suppression of intrusive or unwanted reverberation fields. For more details, contact AMEK US Operations Inc., 10815 Burbank Blvd., North Hollywood, CA 91601. Tel: 818-508-9788. Circle EQ free lit. #103.



HIGH-CLASS HOUSING

rgosy Console's newest 90 series studio console housing has been specially designed to incorporate project studio-based boards — e.g., Mackie 8•bus, Yamaha 02R, Behringer Eurodesk, and so on — into a full-featured console. The Argosy 90 series chassis permits variable combinations of mixer, patching, rack-mount effects, and automation components to become one unit. With prices beginning under \$2000, Argosy's 90 series could be what you're looking for to keep your gear in order. For more information, contact Argosy Console, Inc., Rt. 3, Box 4374-A, Osage Beach, MO 65065. Tel: 573-348-3333. Web: www.argosyconsole.com. Circle EQ free lit. #104.

DYNAMICALLY DIFFERENT

he Studio 12R Mixer/Microphone Preamplifier from Alesis is a 12channel, 3U rack-mountable mixer designed for recording studios, livesound reinforcement, and fixed installations. With eight quality mic pre-

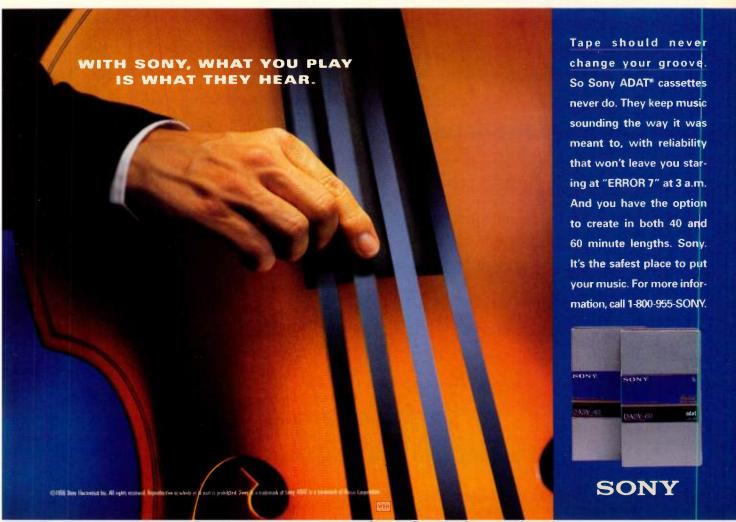


amps that feature a hybrid/discrete design, the Studio 12R provides eight channels of low noise and distortion while offering an output level large enough to take advantage of the wide dynamic range available on digital recorders. Alesis has also incorporated balanced XLR inputs and 48 V phantom power into each mic pre, and each individual channel utilizes a long-throw 60 mm linear fader. The Studio 12R also offers high and low shelving EQ controls at 12 kHz and 80 Hz, two Aux sends (one prefader and one postfader) per channel, as well as individual insert points on each channel. For more details, contact Alesis Corporation, 3630 Holdrege Avenue, Los Angeles, CA 90016. Tel: 800-5-ALESIS. Circle EQ free lit. #105.



VITAL SIGNS

he Tube Vitalizer Model 9530 from SPL is the top-of-the line product in the Vitalizer line. It offers tube, LC, transistor, and semiconductor technologies. The sound processing of the Tube Vitalizer is divided into two sections. The left side offers the controls of the improved Vitalizer circuitry (filtering using RC or LC filters; a 2-band compressor). On the right side is the tube output section, which can be switched in or out, and two VU meters. For more information, contact SPL, distributed by beyerdynamic, 56 Central Ave., Farmingdale, NY 11735. Tel: 516-293-3200. Circle EQ free lit. #106.



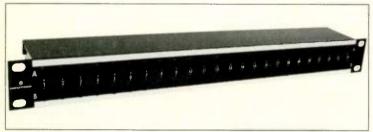


THE REGULATORS

oroid Corporation of Maryland has introduced its new ISO-BOX Series of isolation transformers mounted inside a rugged aluminum enclosure with four standard power ratings (300 VA, 600 VA, 1200 VA, and 1800 VA) in response to low leakage current requirements. Toroid's new product line of enclosed isolation transformers offers



all the advantages of toroidal construction such as low weight, low magnetic strayfield, low EMR, low mechanical noise, low losses, high efficiency, and cool operating temperature. All four models of the new ISO-BOX Series isolation Transformers operate at a line frequency of 60 Hz with 120 V input and output voltages. Each model has an illuminated On/Off circuit breaker and is equipped with a six-foot-long power cord and Hospital-Grade three-prong grounded plug. For more details, contact Toroid Corporation of Maryland, 2020 Northwood Drive, Salisbury, MD 21801. Tel: 410-860-0300. Circle EQ free lit. #107.



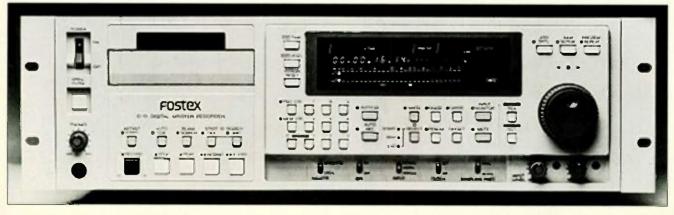
THE MISSING LINK

eutrik USA's PatchLink^{**} 1/4-inch modular patching system offers a self-contained, fully wired, printed circuit board (PCB) patch panel in a 19-inch rack-mount case. Both the front and back panels of the unit feature two rows of 24 sockets for a total of 48 balanced 1/4-inch jacks that mate with the EIA-standard RS-453 plugs such as the Neutrik NP3C and NY\$224. Viewed from the front, each verti-

cal row of two is PCB connected to the corresponding back vertical row. The PatchLink Modular Patching System also ships with indentification strips. For more information, contact Neutrik USA, 195 Lehigh Avenue, Lakewood, NJ 08701. Tel: 908-901-9488. Circle EQ free lit. #108.

NOW DAT'S AFFORDABLE

ostex recently introduced the D-15 digital master DAT recorder with full timecode functionality, including optional chase-lock capability. At a suggested retail price of \$3295, the Fostex D-15 offers multiple cue levels (–120, –30, –40, and –55 dB), cue times (1500 ms, 1200 ms, 900 ms, 600 ms, and 300 ms), and multiple reference levels (–12, –18, and, –20 dB). The D-15 also features a reference play mode, onboard parallel ports, 18-bit/64X oversampling inputs and 20-bit/8X oversampling outputs, a panel lockout switch, I/O trim pots, and an adjustable offset command. With the optional Model 8335 T/C external sync card (\$595), the D-15 becomes a truly affordable chase-lock-capable DAT recorder with an optional RS422 board offering serial control. The unit also offers a new graphical user interface that helps to speed up the system's learning curve, front-panel calibration controls, and fully upgradeable software. For more details, contact Fostex Corporation of America, 15431 Blackburn Ave., Norwalk, CA 90650. E-mail: info@fostex.com. Tel: 310-921-1112. Circle EQ free lit. #109.



KEEP 'EM SEPARATED

ltec Lansing's 7120A/7140A power amps are engineered to operate independently or as part of a supervised control system. Both amplifiers are two-rack-space, dual-channel amps with the 7120A rated at 100 W per channel and the 7140A rated at 200 W per channel. Both



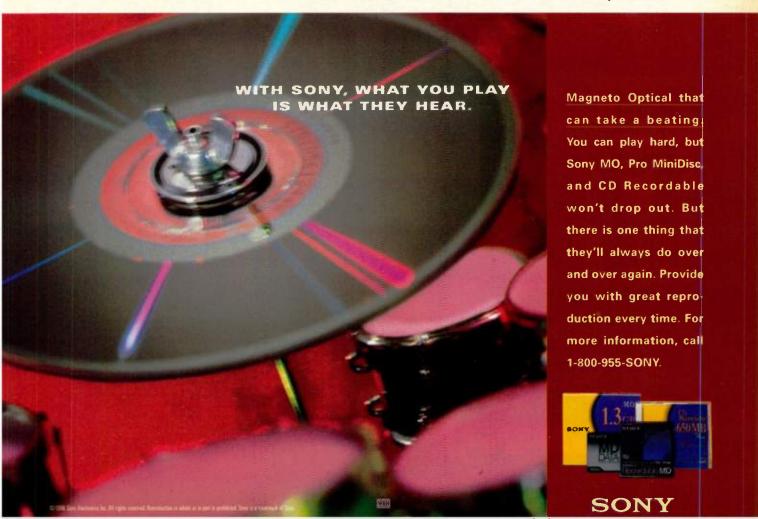
channels can be independently configured for 8/4-ohm or 70.7 V operation. Signal processing PCBs mount directly to input modules without the need to replace the module itself. Processor PCBs can be linked to multiple amps. The 7120A/7140A (\$923 and \$1035, respectively) utilize a continuously variable cooling system that draws air from the front and pushes it through the rear. For more details, contact Altec Lansing, 600 Cecil Street, Buchanan, MI 49107. Tel: 616-695-6831. Circle EQ free lit. #110.

A SAMPLER FOR THE HOLIDAYS

he Akai CD3000XL stereo digital CD-ROM sampler is a three rack-space professional stereo sampler with a large 40 x 6 character LCD display and a built-in 4X CD-ROM drive. It offers a total of 8 MB of RAM standard and can be expanded up to 32 MB with standard SIMM memory. The unit comes equipped with 10 outputs (stereo outputs plus 8 individual outputs), S/PDIF digital I/O, and SCSI



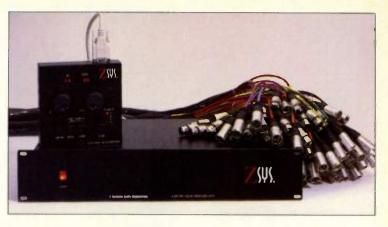
standard and offers the ability to accept Akai's SampleVerb 4-bus voice assignable multieffects processor board. The CD3000XL also supports stereo direct-to-disk recording and two ROM card slots that allow up to 16 MB of nonvolatile flash ROM and up to 48 MB of sample storage. The unit is also compatible with M.E.S.A. (Modular Editing System by Akai) sample editing software. Its price is \$2495. For more details, contact Akai Professional, 1316 E. Lancaster, Ft. Worth, TX 76102. Tel: 817-336-5114. Circle EQ free lit. #111.





KEEP IT STRAIGHT

esigned to work with digital audio signals, the z64.64r Digital Detangler Pro from Z Systems is an automated patchbay, router, and distribution amplifier in one package. The z64.64r features 64 AES/EBU stereo pairs in and out, giving users the power to physically interconnect all of their gear (digital audio workstations, CD players, A/D and D/A converters, digital multitracks, signal processors, and DAT machines) in the digital domain. Users can dynamically change the routing pattern with the touch of a few buttons on the z-rrc router remote control or computer control interface (both Mac and Windows

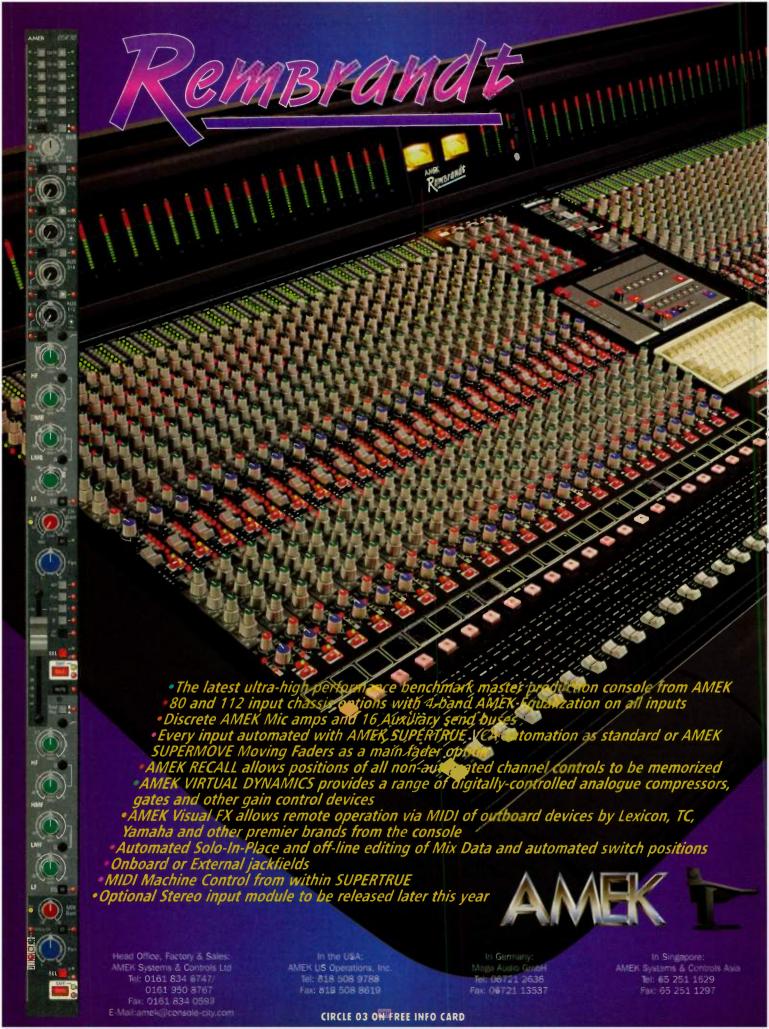


available) without having to unplug and rearrange cables. You can create presets or "salvos" that can be recalled for instant reconfiguration on the fly. (For more information on Z Systems Detangler series, see the review of the z-8.8 Detangler in November issue.) For more information, contact Z Systems Audio Engineering, 4641-F N.W. 6th Street, Gainesville, FL 32609. Tel: 352-371-0990. Circle EQ free lit. #112.

GET IN LINE FOR THIS

he VTC console from TL Audio is an 8-bus, inline, fully modular, tube console available in 16-, 24-, or 32-channel configurations with optional 8-, 16-, or 24-channel sidecar expanders. Each of the VTC's I/O modules include 4-band EQ with fully parametric mids, six mono Aux sends, one stereo Aux send and 4 tube stages per channel. The master section of the console features six stereo FX returns on 60 mm faders, eight group faders, two independent headphone feeds, switchable PFL/Solo in place, and two tube stages in each master mix bus The VTC also includes a VU meter bridge with one meter for each group and stereo meters on the L/R busses. For more details, contact Sascom Marketing Group, Inc., 34 Nelson Street, Oakville, Ontario, L6L 3H6, Canada. Tel: 905-469-8080. Circle EQ free lit. #113.





PORTA-POWER!

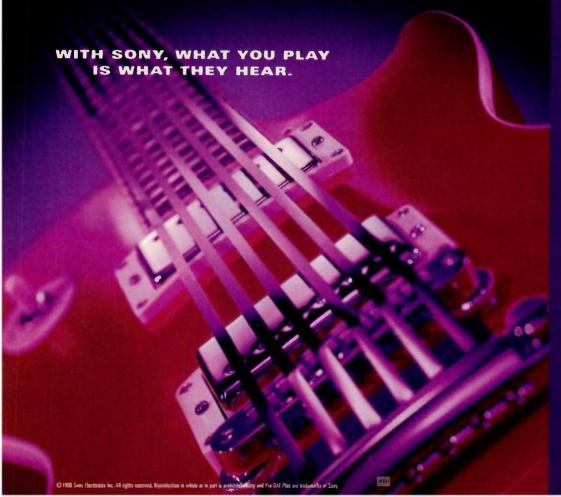
ASCAM's new 414 Portastudio features high-end features including 4-track simultaneous record capability as well as four full-function input channels. Each input channel features mic/line input capability, a variable input trim control, and high and low EQ. The 414 also boasts two effects sends per channel and two stereo returns. TASCAM has also incorporated a discrete sync output to drive MIDI gear, separate L/R monitor and main outputs, and an optional hands free punch in/out (using the optional RC-30P footswitch) into the design of the 414. TASCAM's 414 Portastudio carries a retail price of \$449. For more details, contact TASCAM, 7733 Telegraph Road, Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #114.



ANY RELATION TO R2-D2?

arris's latest ADA offers 20-bit A/D and D/A conversion technology for production and broadcast studios. The A2D2A converter provides 100 dB of A-weighted dynamic range in both the analog-to-digital and digital-to-analog signal paths. For interfacing with analog studio equipment, XLR and 1/4-inch connectors are provided. As for the connections to and from digital gear, Harris's ADA supports both AES/EBU and S/PDIF (IEC 958) formats. Users can select from three sample rates: 48, 44.1, and 32 kHz or lock the A/D converter to an external AES/EBU reference signal. Retail price is \$599. For more information, contact Harris Corporation, Broadcast Division, 3712 National Road West, P.O. Box 1487, Richmond, IN 47375. Tel: 317-962-8596. Circle EQ free lit. #115.





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PLUG-IN POWER

ower Technology announces a new software plug-in for the DSP•FX 32-bit effects processing system that provides multiband parametric equalization. All equalization is performed using 32-bit floating point processing, and each band can be independently set to make level

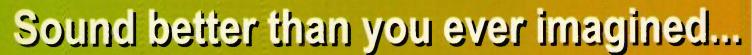


changes. The DSP•FX is fully compatible with the optional DSP•FX AES Interface adapter. For more information, contact Power Technology, 100 Northill Dr., Bldg. #24, Brisbane, CA 94005. Tel: 415-467-7886. Circle EQ free lit. #116.



A REALLY COOL TEACHER

ool Breeze Systems, Inc. has started shipping the first in a series of CD-ROMs that provide a basic education in the operation of a digital audio workstation. *Cool School Interactus, Volume 1* covers such topic as "The Basics" (computers, sound, MIDI, and digital audio), synchronization, system upkeep, Pro Tools, Sound Designer II, and SampleCell II. The disc is both Windows and Mac compatible with 100 movie tutorials and program simulations, 500 pictures and flow charts, and a bonus glossary with over 1200 terms. Cool Breeze Systems, Inc.'s *Cool School Interactus, Volume 1*, has a list price of \$99.95. For further details, contact Cool Breeze Systems, Inc., 2041 Riverside Drive, Suite 122, Columbus, OH 43221. Tel: 614-481-4000. Circle EQ free lit. #117.





104 Apnex Aural Exciter with Big Bottom - 2 channel



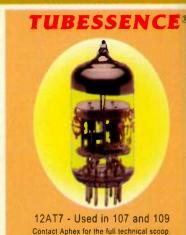


108 Aphex Easyrider® Compressor - 2 Channel

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 automotic 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 (NERNbers: 4150253, 5359665, 5334947, 5450034, 5424488, 5483600.

Q 'EM UP

Sound Labs, Inc. has released a major upgrade to its 3-D audio localization plug-in, QSYS/TDM for Pro Tools 4.0. Based on the QSystem II hardware QSound 3D audio processor, the upgrade features the ability to place up to four independent mono audio channels (individual tracks or submixes) in specific static or dynamic positions within an enhanced stereo soundfield, which extends beyond the limitations of conventional stereo reproduction. QSYS/TDM 2.0 adds new features to the programmable cyclic autopanners and advanced mono-compatibility of the original release. Version 2.0 will also include full automation, providing independent repeatable control of dynamic movement on each channel. QSound's highpass filter process will also be independently controllable on each channel. Pricing has not been set as of press time, but QSound Labs will upgrade all current and future registered owners of v1.0 to the full commercial 2.0 release for shipping costs only. For more details, contact QSound Labs, Inc., 2748-37th Ave N.E., Calgary, Alberta Canada T1Y 5L3. Tel: (L.A. Office) 213-876-6137. Circle EQ free lit. #118.





RADAR LOVE

tari recently released Version 1.4 software for its RADAR digital multitrack disk recorder/editor. Version 1.4 includes a number of significant new features applicable to both music and postproduction and is being provided to RADAR users free of charge. Key new features include: RADAR Link, which allows multiple RADAR units to be sample-accurately linked together and controlled from a single RE-8 session controller; Machine Control, which allows RADAR machines to slave to Sony P2 extended protocol; Enhanced DSP Jog, which helps provide smooth and more accurate functionality; MIDI timecode ability; extended Time Display options; and a Sync Marker. For more information on RADAR version 1.4 software, contact Otari Corporation, 378 Vintage Park Drive, Foster City, CA 94404. Tel: 415-341-5900. Circle EQ free lit. #119.

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

168RC Digital Recording Console The heart of a new, component-based Digital Recording System from Soundlink

The 168RC is the first

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

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

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

The 168RC is equipped with three-band EOs



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

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

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

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SoundLink DRS 1212 1/0 Multi-Channel Audio Interface



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

With the power of advanced

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

The 1212 I/O features 12 inputs and 12 outputs configured as two analog I/Os, an S/PDIF I/O and an eight channel ADAT optical I/O. All the I/Os can be used simultaneously. For even more control and flexibility, the 12121/O connects to Korgs 168RC Recording Console. or to the Korg 880A/D and 880D/A interfaces.

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



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

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



Virtually Yours

The Aliens have landed
— in Chicago no less —
using a virtual console

STUDIO NAME: Alien Soundscapes Inc. (ASI)

LOCATION: Chicago, Illinois

KEY CREW: Chris Greene, Chief Engineer; Alex Gustafson, Second Engineer; and Faith Benali, Office Manager

RECENT CREDITS: Remix of title cut for *Mortal Kombat II* (motion picture soundtrack) by GZR, produced by Martin Atkins; Mesclyn, *Mesclyn*, Warzone Recorders; Invisible Records, *In Dust We Trust Compilation*, editing and mastering

CONSOLE: Digidesign Pro Tools/TDM (48 recordable tracks, aux/sends and returns/bussing configurable per session; 70 PTIII faders viewable at once across 3 monitors)

MONITORS: Genelec 1031s and 1094 subwoofer. (Antares SST Geophysical Modeling filters for additional monitor/room alternatives.)

MICROPHONES: Assorted beyordynamic, AKG, and Shure

KEYBOARDS AND MODULES: Alesis Quadrasynth Plus; E-mu Morpheus; Nord Rack: Kurzweil K-2000RS: Sequential Circuits Pro-One; Roland R-8 HARDWARE: Apple Power Macintosh 9500 running Pro Tools PCI hardware with 128 MB of RAM and 24 MB VRAM: Power Macintosh 7100 with 64 MB of RAM; Radius 81/110 with 48 MB RAM and 12 MB of VRAM; Macintosh Centris 610 with 68 MB of RAM; Radius/Trinitron 20-inch monitors (5760x3240 Pixels) [3]; Apple/Trinitron 15-inch monitors (1920x1440 Pixels) [3]; 17-inch SVGA monitors for office and Media Systems [2]; Magma PXB-7-RMD PCI Expansion Chassis; Opcode Studio 4 MIDI Interface; Studio Technologies Mic Pre Eminence preamps; Panasonic SV3700 DAT Recorder; Alea CD-R mastering system (Yamaha mechanism); EXABYTE

8505XL 8 mm Drive; Seagate Barracuda hard disks [4] in Rorke Data, 8-bay SCSI rack; ADA MP2 MIDI Tube preamp; Vintage Braun Mastering turntable; ART MIDI foot controller; custom splitters and cable extensions for video monitors keyboards and computers

INSTRUMENTS: Parker Fly Deluxe Guitar; vintage acoustic violin and mandolin. SOFTWARE: All available TDM plug-ins. New favorites include: Apogee Master Tools; Antares Multi Dynamic Tool, Infinity, and Spectral Shaping Tool; Waves Trueverb, L1, S1, C1, and Q10; Digidesign's Intelligent Noise Reduction and Master List CD; Steinberg's DeClicker, Time Guard, Spectralizer,

and Red Valve It; Intelligent Devices I.Q. and AD-1; CRE's Protron; Q-Sounds Q-Sys TDM; Arboretums Hyperprism TDM

ADDITIONAL SOFTWARE: Pro Tools III; Emagic's Logic Audio, ZAP, and TDM Extension; Grey Matter Response's Media Archiver, DDP formatter, and Audio Drive Formatter; Opcode's Studio Vision Pro and Max; MOTU's Digital Performer; Steinberg's ReCycle, Time Bandit, and Cubase Score XT; Synclavier's S-Link

STUDIO NOTES: Owner Chris Greene states: ASI was conceived out of the desire for fidelity, power, and flexibility for myself as an artist, and my clients who hire us, either to master, which is our primary



function, or as a production company to write, record, mix, or remix. With the aid of Paul Foeckler of Digidesign, Clint Ward of Emagic, and many others, we've created the core studio of what may be the future of pro audio.

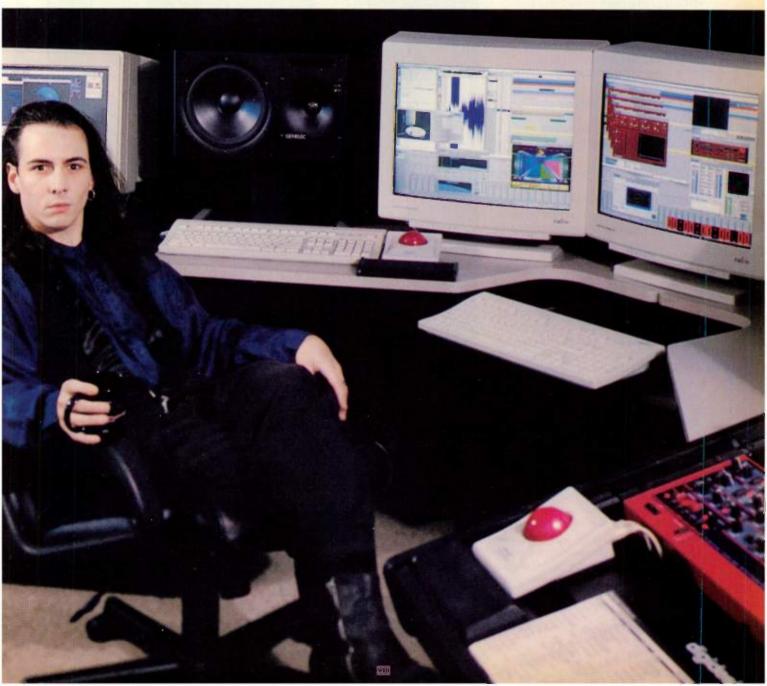
EQUIPMENT NOTES: Greene continues: ASI currently has over 20 GB of AV-quality drive space to work on. A few words of advice we might give to prospective "virtual studio" owners would be on data management. Grey Matter Response's Media Archiver with our EXABYTE drive allows us to background stream a 7 GB archive or restoral, while we continue working, allowing no wait session to session booking of the studio. Since we work on projects as varied as

posting audio for film and television to producing local talent and interesting low-budget projects we enjoy, we need to be able to fly from one gig to the next.

Another tip would be in regards to "feature-itis." It has taken the DAW industry by storm, and, as the occasional consultant through Gand Music & Sound for studios such as Chicago Trax Recorders, King Size Recorders, and River North Recorders, as well as clients like David Sylvian and Oscar Peterson, it's been crucial for me to match their needs with the correct tools. Some of my favorite records have been made on 1-inch 8-track analog decks. I've watched fantastic artists fight for months to cre-

ate the DAW of their dreams, ultimately selling it to get a tape machine. Carefully analyze the needs of your studio and purchase for those needs.

Last, but certainly not least, remember that you do get only what you pay for. We at ASI have invested considerably in the finest available hardware and software to achieve the results and fidelity we do. Although computers are getting faster, nothing replaces a good microphone, preamp, A/D converter, DSP chip(s), a well-written algorithm, or ears. ADDITIONAL INFO: Chris Greene's Web page for TDM plug-ins is at www.gand.com. Call ASI at 312-502-4747 for more information.



Turner 80 and Hilevel

This pair from the past has industrial strength

MICROPHONE NAME: Turner 80

FROM THE COLLECTION OF: William

Stace/Walls Have Ears

PRICE WHEN NEW: \$15.95 (1950s)

TYPE OF MIC: Crystal

POLAR PATTERN: Nondirectional

FREQUENCY RESPONSE: 80 to 7,000 Hz

SENSITIVITY: 58 dB below volt/dyne/square centimeter

WEIGHT: 5 ounces

MICROPHONE NAME: Turner HiLevel

FROM THE COLLECTION OF: William

Stace/Walls Have Ears

PRICE WHEN NEW: \$25 (1936)

TYPE OF MIC: Crystal

POLAR PATTERN: Nondirectional

FREQUENCY RESPONSE: "Flat from 500 to

6,000 cycles"

SENSITIVITY: 54 dB below 1 volt/dyne/

square centimeter

MIC NOTES: Both of these microphones were products from The Turner Company based in Cedar Rapids, Iowa, which manufactured a full line of mics intended for various industrial uses such as public address, dictograph, and surveillance work. Inside the Turner 80's die-cast zinc, chrome-plated casing was a "Bimorph moisture-sealed crystal" that the company described as blast and mechanical shock-proof. The Turner 80 was primarily designed for voice in dispatching, office, and factory paging systems and amateur radio applications. For an additional \$3.35 you could purchase the C-2 desk stand to complement the 80.

The HiLevel was designed to reproduce "a full human voice," and in an ad dated July 1936, Turner's headline was, "Your ear to the future." The \$25 price also included a stand and an eight-foot cable. *Technical data courtesy of Bob Paquette*.

OSER TIPS: While the Turner 80 is currently nonoperable, the HiLevel is still in active service. Owner William Stace notes: "I use the Turner HiLevel primarily for special-effects recording. This mic is ideal for recordings where I need an old-time radio-type of sound for voice or instruments. By varying the distance of the mic from the sound source, a very unique distortion can be controlled from very light to very heavy — which is especially great for vocals."



o by Edward Coive

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TOOLS

"Rumble" from

The Songs Of West Side Story

Producer David Pack talks about recording this unique track

BY STEVE LA CERRA

EQ: Where did the idea for "Rumble" come from?

David Pack: This disc is a tribute to Leonard Bernstein, and I felt it really needed an instrumental highlight — something that took a hard left from the rest of the record. "Rumble" was the climax of the movie, and I thought of doing a musical rumble between the two mu-

sical factions: the jazzers and the rockers. I wanted to portray musically what we had come to love on the big screen. I knew that it had to be Chick Corea as far as the jazzers go because we all know what Chick represents in that idiom. I kept asking Chick to do it, but he couldn't because he was too busy doing albums and touring. After nine months he finally said he could do it. The whole idea was to reassemble the bulk of his Electrik Band (Chick, Dave Weckl on drums. Frank Gambale on guitar, Eric Marienthal on sax and Jimmy Earl on bass) and pit them against some rockers who were equally as fiery as Chick. Steve Vai loved the idea and then we thought it'd be great to get players like him, Greg Phillinganes, Simon Phillips, Lenny Castro, Jon Pena, and David Paich—these unbelievable rock veterans—and pit them against these amazing jazz veterans.

How did you set them up in the studio? The recording was done by Allen Sides in Studio 1 at Ocean Way's annex building, which is an amazing room. Allen and I had the idea to line up the two groups so that they were facing each other. For general recording purposes, Allen thought that it would be better to put the drummers side-byside, keeping in mind the stereo imaging between the two drummers. Allen placed (percussionist) Lenny Castro

right in between the two drummers. Think of an aerial view of a triangle with Dave at the lower left point, Simon at a the lower right point, and Lenny at the top. Then along the left and right sides were the two bands facing each other. Allen had me on a podium in the middle conducting the whole thing - I was the referee. In the end we used every possible room and booth at that studio. We had Steve's guitar stack with two 4x12 cabinets in an iso room and we had to put Eric in a little vocal iso booth where he barely could see out the window. But Chick and Steve were pretty much nose to nose, about 15 feet apart.

What were some of the mics used?

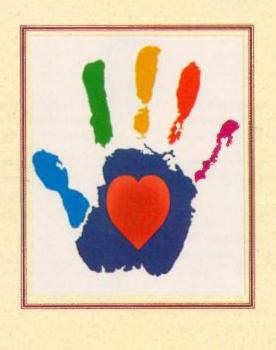
Steve's guitar cabinets were miked with Shure SM57's and Allen also used a pair of KM 53 tube mics for ambience. Eric's

sax came through a U 47 tube and we also used C12A's in the booth for ambience.

I think that

Allen probably used every one of his classic mics that day! He loves using his vintage C12's on the drum overheads and C12A's on the toms - he used those for both drummers. Simon Phillips has mics built into his drums, but Allen has unusual kick drum preferences. I have never seen any other engineer use a Neumann U47 FET for kick - he'll use that outside the bass drum, then a dynamic mic like an AKG D12 inside the drum, and take a blend between the two.

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One of the problems we ran into was, how do we keep Simon Phillips (who has a massive double bass drum kit) from overpowering Dave Weckl's little Yamaha jazz kit? We decided that whenever the two bands were "rumbling" — trading phrases — we would pan Chick Corea's entire band hard left and pan Steve Vai's rock group hard right. That really helped to delineate in the stereo image what was going on and helped emphasize the whole concept of battling it out.

How many inputs did you use?

The board in there at the time was a highly customized 80-channel Neve 8078 with GML automation.

How did you fit this all on tape?

Believe it or not we had three of those huge vintage Ampex ATR-124 24-track machines [recorded at 30 ips on 3M 996, +5—Ed.]. They are these big square metal, five-foot-tall behemoths, and three of those were linked up. I started off rehearsing it with a click track, but with Simon Phillips and Dave Weckl playing drums, having a click is ridiculous.

How many takes did the band do?

Everybody had charts that were probably around 25 pages long — a ridiculously long chart that David (Paich) and Simon helped me with. But much like a Frank Zappa chart, there were spots open for improvisation. As far as keeper takes, we did one and then timed it at 12 minutes long. I knew that RCA would only allow me about 8 minutes, so we had to cut it down. After we recorded the 12-minute version, I told the musicians, "I'm sorry but we have to cut this down." We cut the chart down to about 8 minutes and the first take we did after cutting it down is the one we kept.

That take was not edited via tape in any manner...
Right.

I know the musicians performed live. Were there any overdubs?

There were actually one or two. Both Chick's and Steve's solos were done live. I had an afterthought that Chick and Steve should do a little more battling in some sections, so we had one more session with them at Steve's studio. Chick had his remote keyboard and Steve had one of his seven-string Ibanez guitars. At the opening we initially did not have

much going on; I thought that it would be more exciting if we showed a glimpse of what was going to come — if Steve and Chick had a little "pre-war" conversation at the very beginning.

Meaning where that first hit comes and

the guys are kind of riffing together...
Yes. After Chick's extended piano solo intro there's a downbeat. The initial riffing that you hear between Chick and Steve was an overdub. We should have thought of that on the spot, but there was so much going on with the excitement of the session. Afterwards we all agreed that it would be a great thing for

them to get back together to do that. When the song finally breaks down and goes from slow to fast, back and forth, they had another conversation that I also felt was important. It was great — Steve face to face with Chick.

Just before we mixed it I decide that I wanted a bigger "boom" on the opening hit when the band comes in (which was actually written into the Bernstein score). I didn't want to use anything sampled -I wanted the real thing, so I had Joe Porcaro come in with a giant orchestral bass drum that went down to about 20 Hz it'll blow the woofers out of your speakers if you turn it up loud enough. Whenever the band does those hits opposite the riff, you'll hear the bass drum. It was something I had noticed at the last minute, but it is very integral to making this piece sound semi-orchestral. And also it's great audio for your woofers.

On the day we recorded, it occurred to me (as a fan of Chick's) that I'd love to hear a little bit of Chick by himself. I laid this on Chick when he arrived (I had the grand piano tuned and ready) and he was quite surprised. He actually did an amazing piano improvisation on the spot. Then, as soon as he struck the last note of the piano improvisation, he literally leapt up in the air from the grand piano and raised his arm to give us a downbeat cue as his other hand was coming down on the Rhodes. After he lived with it for a while, Chick felt he could improve upon his piano improvisation. He decided to give me some improvs done from his home studio. So he recorded ten and told me to pick one. And they were all spectacular. Each was between two and three minutes; little mini masterpieces that are basically theme and variations on some of the musical quotations from West Side Story. It took me three weeks of agony to pick one of the ten to put on the record!

California

Covina: Guitar Center

El Cerrito: Guitar Center

Fountain Valley: Guitar Center Garden Grove: Pro Sound & Stage Lighting Glendale: Astro Audio Video Lighting, Inc.

Hollywood: Guitar Center Oakland: Leo's Professional Audio Pleasant Hill: Guitar Center San Diego: Professional Sound & Music-Guitar Center San Francisco: Guitar Center—K. & K. Music, Inc.

San Jose: Guitar Center San Rafael: Bananas At Large, Inc.

Sherman Oaks: Guitar Center

Connecticut

Danbury: Eastcoast Music Mall New Haven: Sam Ash Music Corp.

Florida

Clearwater: Thoroughbred Music Ft. Lauderdale: Ace Music Center, Inc. Margate: Sam Ash Music Corp. Miami: Guitar Center

Georgia

Atlanta: Rhythm City

Illinois

Arlington Heights: Guitar Center Burbank: Guitar Center Glenview: Windy City Music Villa Park: Guitar Center

Indiana

Ft. Wayne: Sweetwater Sound, Inc. Indianapolis: IRC Audio Inc. South Bend: Woodwind And Brasswind

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Boston: Guitar Center

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Middletown: Alto Music of
Orange County, Inc.
New York City: Canal Hi Fi,
Inc.—Sam Ash Music Corp.
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Arlington: Guitar Center

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McAllen: Hermes Trading Co., Inc.

Virginia

Roanoake: Lee Hartman & Sons, Inc.

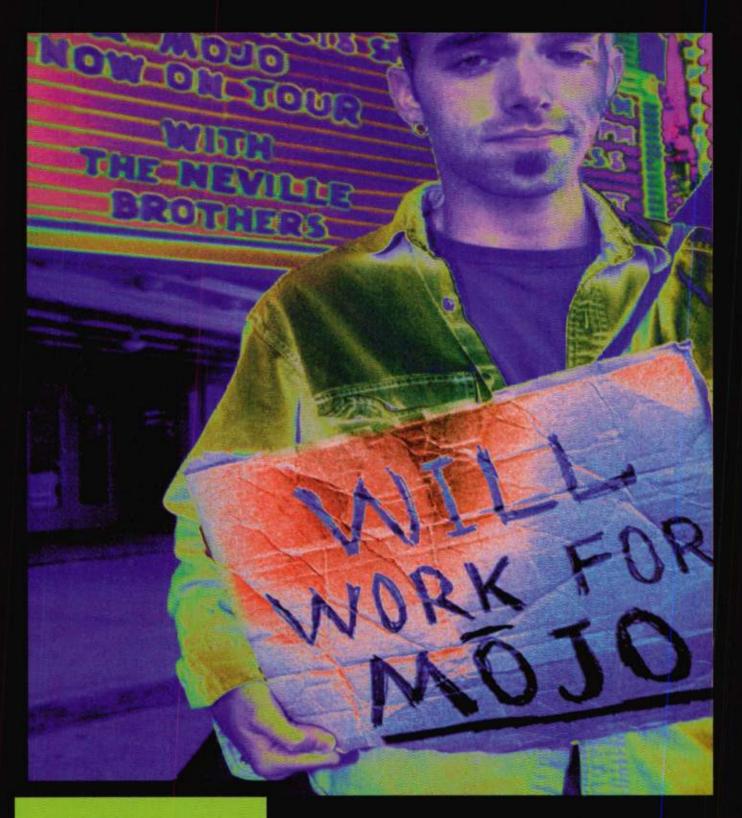
Washington

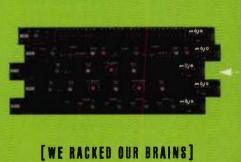
Lynnwood: Morgan Sound

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Deftones "Bored"

EQ speaks with engineer Terry Date on this chartclimbing Deftones track

BY LIANA JONAS

EQ: How was the bass recorded?

Terry Date: The bass was recorded live. We used a Shure SM57 right in front of the cabinet and put a DI on it — like most people do. I don't get too fancy with microphones, I more try to build a character sound from the instrument. I spend more time trying to get the play-

er to play a certain way then relying on microphones to develop the sound.

Was the entire band recorded live for the track?

Yes. We basically had the whole band set up in one room. There was some leakage, but a little leakage is not a problem for me - in fact it is an advantage to me. We used floor monitors for everyone except the drummer. I do that pretty much all the time. In the type of music I do, I've never met a musician except for maybe a drummer who preferred headphones to the natural sound of their instrument. It really alters their performance if they're listening through headphones. Each band member has his own monitor mix and everyone

is together in the same room.

Did you isolate between the monitors and cabinets?

We had big foam dividers in between everything. We let the band set up as they wanted and then took it from there. We started with the bass in between the guitar and drums. If instruments are going down at the same time, what usually happens is that the leakage signal gets drowned out by the primary signal so you don't even notice it.

How did you get the guitar's big, resonant sound?

A lot of that is Stephen Carpenter and his ADA/Marshall combo. It was definitely tubes and not transistors. Some of the sound also is a result of how I EQ; taking most of the mid information out. I don't do any processing on the guitar, but I did double all the rhythm tracks. I try to keep the sound as original as possible.

Chino's vocal resembles the effect you get when you mute a trumpet.

His voice has a lot of character, and he is able to change it. A lot of it has to do with the way he cups the mic. He uses his hand over the mic in different positions to get different sounds. I got him to use the mic as an instrument. I always do vocals on an SM58, which is a calculated decision since most of the bands I work with have careers that are 90 percent live work with '58's. Chino destroyed that microphone during recording — threw it around, spit in it. We used that same mic for the whole track and I gave it to him afterwards.

You must have used compression being that there were floor monitors present.

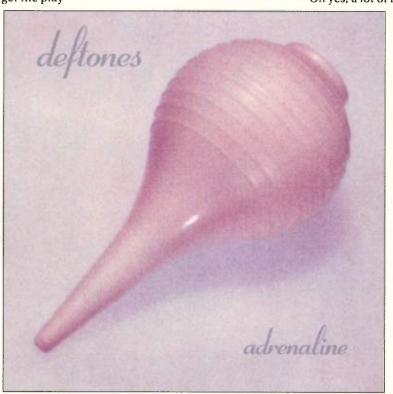
Oh yes, a lot of it. I compressed the vo-

cal really hard so that when he is singing, the voice sounds louder and the background noise disappears. The problem is that when he is not singing, there's more feedback and leakage. But then, in the mix, you go through the tracks and mute or noise-gate the stuff you don't want.

With all of the floor monitors that you had in there, did you experience any kind of feedback? If so, what did you do about it?

I didn't do anything about it. There wasn't too much of a problem when the band was cutting tracks live, but when we went back to redo the vocals there was some feedback from time to time. Chino would cup his mic

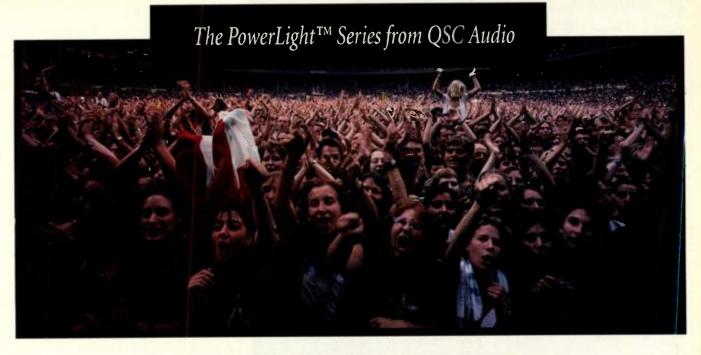
in a certain way or he'd drop the mic in front of the monitor and it would catch some feedback. Some of that stuff we actually left on. There's a lot more that actually happened, but we left only the good feedback in there, and the things that we thought added to the song.



ARE YOU DEF?: The hot track "Bored" is featured on the band's debut LP, Adrenaline.

How did you mic the guitars?

It was all close-miked with SM57's. The ambience comes from doubling. I need a hammer for the type of stuff I do, not a laser; something that can handle the volume. There's not a lot of subtleties going on here.



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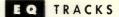
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The vocal is very dynamic. How did you keep him up front in the mix, especially in light of the heavy guitar?

That's the hardest thing. Compression helps a lot and I had to ride his vocal in the mix. Mainly, the guitars are what gets in the way. We had to be real careful in EQ'ing the guitars so that we left a little hole for the vocals. I compressed the vocal during tracking and then again during the mix. For guitars - especially rhythm guitars that are chunky like that — I don't compress at all. I leave those completely dynamic and that creates a little space. Then I EO a little notch out of that area in the middle of the guitar where the vocal usually sits. It's really like a jigsaw puzzle. If you get it right there's not a lot of movement that has to be done on the faders. It pretty much takes care of itself and the instruments push and pull against each other the way they're supposed to.

You seem to bring as much of the live aspect to recording as possible. What would you say is the biggest problem with that? You have technical problems, but that shouldn't be anything that the band needs to worry about - that's my world. You have to know how much leakage and feedback is acceptable and how much racket you want behind the instruments. Initially the biggest problem is positioning of the instruments so that you have the band hearing themselves acoustically the way they do in a rehearsal or live-performance situation. And then I need a signal on each instrument that is clean enough for me to be able to deal with. The biggest problem is when somebody isn't focused and is screwing up. These guys are incredibly focused on what they are doing and they love what they are doing, so it was really fun.

I consider making a record the same thing as a team going out and playing a game. You don't make a mistake and go back to overdub it. The band has to be focused for that one performance. If we go into the studio in that frame of mind when the band is playing, all four or five guys are on the same page and there's a certain urgency to that one take. If everybody knows that they're going to go back and overdub their parts and fix their mistakes, then you have a drummer concentrating really hard and the rest of the band just going through the motions because they know that their time is coming. You don't tend to get any magic moments that way, you tend to get four separate performances.

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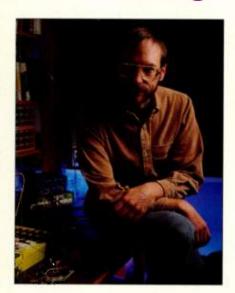




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Studio Ergonomics for the Solo Musician



Put your gear in the right place, and you'll have it at the right time

BY CRAIG ANDERTON

ike the studios of many EQ readers, my studio includes a little bit of everything: synths and samplers, guitars, MIDI, digital audio tape, and hard-disk editing. It's used for projects ranging from songwriting demos to reviewing gear, and from audio-for-video to sound development for my AOL site. As a result, the setup needs to change identities fast and use the available technology logically.

My previous studio was designed in 1983 — pre-MIDI, pre-digital multitrack, and pre-hard-disk recording dance mixes. So when a relocation was in the offing, a lot of time went into designing a new studio setup that would increase efficiency and take advantage of living in the '90s. It works quite well, and while the following may not be applicable to everyone — personal studios are, after all. highly personal — hopefully you'll

find many of the ideas applicable to your own setup.

MEET THE GAGGLE O' GEAR

My main studio tools are:

Computers. The studio has both Mac and Windows machines. Generally, the Mac sequences while the PC handles digital audio; both computers, however, often run simultaneously, necessitating a fluid way to use them together. Electronic Sound Generators. The MIDI sequencer drives several keyboards, some drum modules, and rackmount tone modules.

Guitars and Vocals. My primary instrument is guitar, which requires various effects processors and footswitches/pedals. The vocals also run through processors.

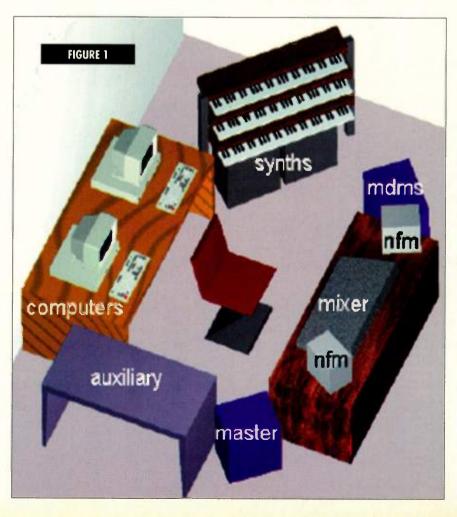
Digital Tape. Hard-disk recording is great, but still can't beat multitrack dig-

ital tape for ease of use and archive costs. The setup uses two ADATs, a BRC, and TASCAM DAT for 2-track work.

Hard-Disk Recording/Editing. There's a tremendous amount of digital audio tweaking done on the PC with Sound Forge, Wavelab, and Digital Wings for Audio (my main tool for dance remix-type music). Mixer. Computer-based mixing is fun, but in one respect I'm old-fashioned and like to have real knobs (and play them!) when doing a final mix.

THE RECORDING PROCESS

Ergonomics should take into account how you record — in my case, the first step is recording tracks into the MIDI sequencer and/or ADATs. Next comes tweaking, which is almost exclusively a fun-with-computers activity. Lastly, mixing takes all the various elements and ties them together.



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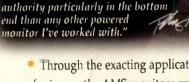


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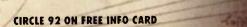
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These different scenarios require different tradeoffs. For example, recording demands minimal ambient noise, whereas mixing requires sitting in the nearfield monitor (NFM) "sweet spot." I use headphones a lot during tweaking, but still need to use speakers as a reality check.

THE SETUP

Fig. 1 shows the setup that finally worked for me; following are notes about certain aspects of the setup.

The key is having the computers on their own table, with the mixing board and monitors located opposite. This puts everything within arm's reach; you can tweak on the computers or the mixer. Buy a good secretary's chair (don't forget lumbar support) that swivels and has wheels so you can glide easily between the two work surfaces.

While at the computers, there's still a decent stereo image from the nearfields. Although the sound comes from behind and the stereo image is reversed, this isn't too critical for general editing.

To keep the table surfaces uncluttered, rackmount boxes are sprinkled liberally throughout the setup. For example, to the side of the mixer there's a digital multitrack rack box with the two ADATs, Al-1 digital interface, Niche ACM module, Symetrix octal compressor, and some other recording-related boxes. The rack on the other side of the mixer is the "mastering" rack with TASCAM DAT, Dolby 740, Rane EQ, and other goodies dedicated mostly to the mixing and premastering process. An additional rack underneath the mixing table has effects used during mixing, such as vocoder, reverb, sweeteners, and so on

The keyboards are on a three-tier stand, with two large rack boxes underneath the master keyboard. These boxes hold a variety of synth modules, the computer's MIDI interface, drum sound generator, rack samplers, line mixer for combining this all down to two channels that go to the main mixer, etc. The rack boxes also provide support for the bottom of the lower keyboard, so I can pound on the sucker without it vibrating too much. While standing at the keyboards (I don't play sitting down), it's easy to monitor what's happening on the computer, or reach over to the mixer if tweaks are needed.

If you have a ton of keyboards, set up another keyboard stand as a mirror image of the first one so they form a "v" (e.g., in fig. 1, the stand would connect the existing keyboard stand's free end and the mixer). In this case, the digital multitrack rack with the digital multitracks could go underneath the second stand.

The Auxiliary table (check out the \$30 "banquet tables" available at office supply stores) has the guitar processors underneath, but what's on top changes constantly - sometimes a unit I'm reviewing for EQ, or perhaps a different format machine that someone brought over to do transfers. It's your basic "trap door" work surface for using whatever unique thingie you need for a particular project.

In many rooms, this setup is compact enough to be an "island." This offers two big advantages: easy access to the back of all your gear (yes!!), and you can also line the wall with shelves to provide storage space for manuals, tapes, removable cartridges, etc. An-

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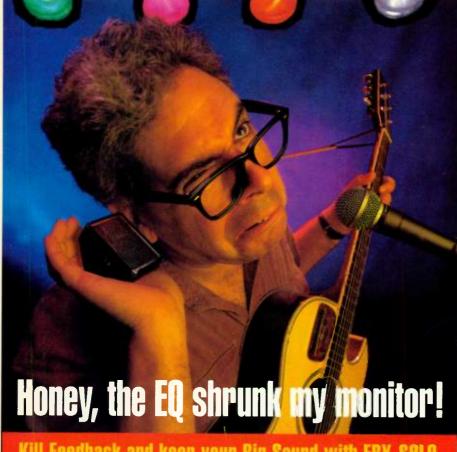
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other advantage is that when doing vocals, you can stand behind the mixer (to the rear of the NFMs) to cut down noise even further, and still be able to manipulate the knobs if you need a quick level or assignment change.

Doing control room vocals requires you to minimize ambient noise. Use external hard drives and put them below the computer table. Just putting them on the floor reduces noise; adding some carpet underneath the drives and on the underside of the table attenuates the noise a bit more. Another noise abatement trick: use powered monitors without fans (I'm using the Event 20/20's).

For guitar, I stand near the auxiliary table, facing the keyboard stand. This keeps the guitar at right angles to the computers, which reduces noise pickup. With high-gain settings (read: absurd amounts of distortion), just turn off the computers and go directly to tape to keep noise down. This also works great for vocals.

The corner between the auxiliary table and computer table has several possible uses. I have a printer there, but office supply stores offer corner "workstation" fixtures that use corner space efficiently. This would not only supplement the above setup, it could be your computer desk if you use only one computer. Or the corner space could have a couple wall hooks for guitars...you get the idea.

TRAX IN A BOX

I've been very pleased with this setup because everything's easily accessible. and also because when it's time to mix, your back is to the computers - all you see is the mixer, which minimizes distractions. Incidentally, the BRC usually rests to the left of the mixer while mixing, but it's on a pretty long cord so it can go on the auxiliary table if I'm recording guitar, or the top of the digital multitrack rack when recording keyboards.

An ergonomic setup makes a big difference. Whether or not this particular setup works for your needs, give some thought to how you use the studio, how you flow among the various functions, and ways to minimize the amount of wasted motion that happens during the recording process. The easier it is to make music, the more fun it is as well.

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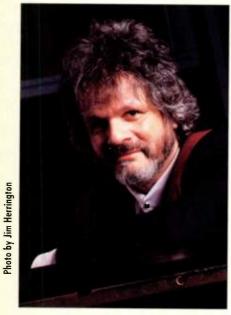
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Lessons With The Masters

Some of the finest musicians I have ever learned from BY AL KOOPER



n 1965, I had just joined the Blues Project after receiving a small amount of notoriety from playing organ on Dylan's Highway 61 Revisited album. I had just switched to keyboards from guitar on that Dylan album and had joined the Project in hopes of honing my skills on the ivories.

One of our early gigs was opening up for the Muddy Waters Blues Band at the Cafe Au GoGo in New York's bohemian Greenwich Village. After salivating in the wings watching them that first night, I approached Otis Spann, the legendary piano player.

"Hi Otis. I'm the keyboard player in the opening band. I'm a really big fan of yours and wondered if you could teach me a few tricks since we'll be together on the bill here this whole week.

He laughed at first, and then after gazing into the virgin sincerity in my eyes, he relented:

"Sure! I don't mind if I do. Meet me here at four o'clock tomorrow afternoon!"

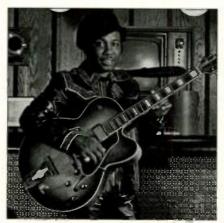
I showed up at 3:30, Otis at 4:15. I laid out the ground rules: If we worked until six, dinner was on me across the street at the DugOut. He was a gentle, considerate teacher, and was able to show me a lifetime of licks in the first two hours. At 6 PM, not pushing my luck, I shepherded him across the street and lived up to my word.

As we dined on steak tidbits, I began to really get to know this man. He was a simple, joyous man with a great laugh and infinite patience. He smoked like a chimney, which ultimately would contribute to his early death from lung cancer.

We repeated the lessons and dinners for two more days and became fast friends. After he had passed on, I used to go sit in with Muddy when he would come to town. I don't think Muddy knew about my "lessons," but I'd always ask him to play "Long Distance Call" when I'd get onstage. As I began to play, I could always get a smile and a head-turn outta Muddy when he heard me carbon copy his long lost sidekick. Now sadly, they're both gone, and Jimmy Vivino and I, their grown-up students, are still exploring the mysteries of their genius.

GREAT GUITARS

In 1972, I heard an amazing record on the radio. I was driving along in Atlanta and had to pull the car over to the side of the road, so compelling was the guitar playing on this track. There were three guitars weaving an incredible rhythmic tapestry the likes of which I had never heard before in my short 28



GREAT GUITARS: Little Beaver



PIANO MEN: Al Kooper and Otis Spann

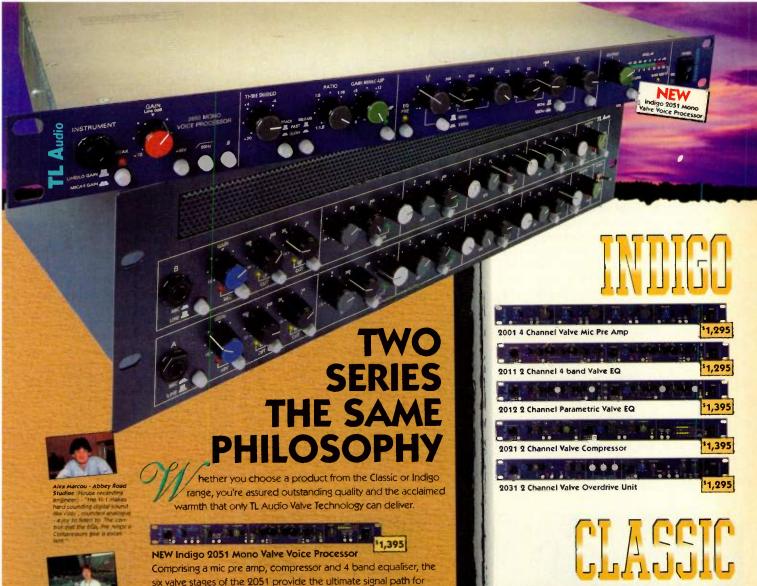
years. I prayed they would announce who this was. At the conclusion, the DJ helped me out with the news that this was "Clean Up Woman" by Betty Wright.

I drove to the nearest record shop, and later that night I listened over and over again to these great guitar players. The next day, I hopped on a plane to Miami and cabbed to the address on the record label. It was in Hialeah, a suburb that housed a lot of industry. The cab pulled up to this warehouse-lookin' place and I double-checked the address. Yup this was it. I walked in and fortunately bumped into Steve Alaimo, who I knew from the Dick Clark days in the '50s. He worked there. I told him I had flown there on a days notice to meet the guitar players who played on "Clean Up Woman." He laughed at me and said, "Come with me! I'll introduce you to them right now!"

We walked through a few hallways and came to this little writing room. We walked in and some guy with a jazz guitar was in there noodling around. "Al, meet the guitar players from 'Clean Up Woman.' This is Little Beaver!"

I was incredulous! "You played all three parts on that record ?" I stammered. He smiled in reply and began to play each part for me. I had a private, clandestine, musical climax right there in that room, at that moment.

This began a fruitful association in which I played on and produced a few sides for them (TK Records) and then continued on page 116







six valve stages of the 2051 provide the ultimate signal path for microphone, line level or instrument sources:

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Growing Pains

om Mgrdichian's project studio has evolved greatly in the four years since we last asked him for tips in putting together a space to make and record music. [See the Room With a Vu in the June 1992 issue. Tom's advice then was to think long-term when buying equipment, experiment with different combinations of gear, and that one need not buy the most expensive or esoteric product on the market to make great recordings. At the time, Tom had three refrigerator-sized racks designed primarily for virtual tracking. Eventually a fourth keyboard rack was added and partner Teddy Castellucci's guitar rig also grew. At that point the 10- x 10-foot bedroom they were working in was getting too cramped. They figured that between cartage cost and the money saved in studio rentals for tracking keyboards and guitars alone could justify an additional investment, so they embarked on

the first part of their project - making a new space ready for newly upgraded equipment.

SOUNDPROOFING THE STUDIO

Tom called me requesting that a 20- x 22foot garage space be turned into a project studio. He had a two-week window and a firm cap on the amount of money he was willing to spend, owing to the fact he didn't intend to stay permanently in the location. The first task was to disconnect the garage springs and seal up the original garage door. We bolted the door to the concrete while mounting neoprene rubber strips on both the bottom and sides. Next we built a wall six inches behind the original door and filled the air space with insulation. Walls were constructed staggered-seam on top of insulation with layers as follows: 3/4-inch particle board, 1/2-inch sound board, 1/2-inch drywall, and then a second layer of 1/2-inch drywall. The ceiling was made from 5/8-inch drywall throughout.

Relatively inexpensive carpet was laid down, with no special treatment for static electricity other than static spray. Next, we installed a dedicated ground rod on the side of the garage. Three separate AC circuits were added, each with individual ground wires going to this rod. Lighting and air conditioning were hooked to the existing (separate) house circuits. Finally, we built an isolated 20-x 9-foot room directly on the back of the former garage for storing road cases and mounting the air conditioner. Vibration and sound isolation between the spaces was achieved by installing neoprene sheets between the studs of the new structure and the outer wall of the studio space.

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TECHNIQUES

been practically nonexistent. After having the room analyzed, we installed RPG treatments (which are fire-rated) to deal with the reflection, absorption, and standing wave conditions. Fine tuning of room acoustics can be an intimidating thing, but the directions provided by RPG were clear and helpful. Tom felt that they communicated very technical things in a nontechnical way.

KEYBOARDS

116

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Tom wanted to build on his analog key-



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E-mail: info@metalithic.com Web site: www.metalithic.com board collection, so he decided to add two pieces from Studio Electronics. The first was the SE1, which is basically a programmable miniMoog with additional envelopes and LFO's and without some of the original's inherent problems. The other was the ATC1. This unit is a programmable analog synth that has interchangeable, original filter cards from the ARP 2600, miniMoog, Oberheim SEM, and Roland TB 303.

Tom says the ATC1 has an "enormous, fat bottom, and saved a lot of space and money because the filters achieve the sounds of the other synths I didn't have." A B3 enthusiast from way back, Mgrdichian searched a long time until finding what he considers a satisfying substitute for a miked Hammond/Leslie combo: the Voce V3 in conjunction with a Motion Sound RS-147 rack-mounted, sealed rotating speaker system. He says, "The V3 along with the MIDI Drawbars allows me to use the controller I'm used to playing, and the premiked Motion Sound saves a lot of set-up time."

Regarding sound quality and spacesaving, Tom jokingly adds, "Sounds great, less filling." He also chose the Voce E Piano, feeling it to be the most accurate MIDI Wurlitzer sound available.

With the new room set up for monitoring around a console rather than a keyboard, he needed an additional pair of monitors on his keyboard rack. Audix PH-25 shielded powered monitors were chosen for their sound and shielding.

MULTITRACKS

Tom was unequivocal about choosing Alesis ADAT XT's. "With the much-improved XT transport, rewind and lockup times are now meaningless between formats, and we felt that the XT's sounded a tad better than other digital formats, including the older ADAT's." But Fostex

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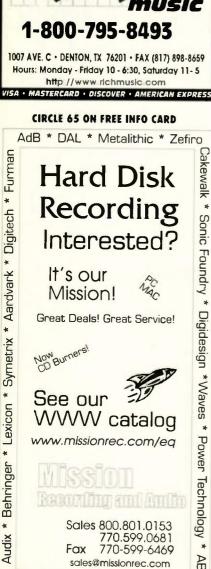
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TECHNIQUES STUDIO DESIGN

Mgrdichian feels that the most important criteria for making a choice is purely subjective. "For me, the thing that separates the ADAT from all of the others is the BRC. I'm a musician, and I like to work in a musical format. Since the BRC allows me to look at my recordings in bars and beats, it's much easier for me to go to the bridge at bar 56 than to SMPTE 1:02:50.29. Also, each locate can be named, so I don't even have to remember that the bridge is at bar 56. It cuts down the production time and adds more creativity when it comes to moving and comping lead or background vocals."

CONSOLE

The console of choice was a Mackie 32.8 with a 24-channel expander. Tom explains, "We needed lots of inputs and good EQ - all quiet and as transparent as possible. The console is mainly used for monitoring tape returns and mixing. We record most everything either direct from my keyboard racks to tape (via Mackie 1604's) or through Neve or Aphex 107 mic pres. I don't want a console that won't give an accurate replication of the sound going in. Our old recording system (an Akai analog 12-track) lacked accuracy. The goal was to make it sound great here and have it sound the same in a highend room."

Tom and Teddy's increased workload necessitates automation and they decided on Mackie's Ultramix, which Tom states, "is the best automation in its price range. Granted it's not Flying Faders, Ultimation, or Massenburg, but it's not \$100,000 either. There's no level-change zipper noise and the VCAs are cleaner than the stuff you often find

on really high-end consoles." Mgrdichian's setup has 60 channels of automation wired in at the channel inserts of the console. Eight additional channels of automation show up on the patchbay and can be inserted into any audio chain.

TOYS, TOYS, TOYS

Tom's outboard rack is loaded with a fine selection of processors, including Aphex 107 (mic pres), 661's (tube compressors), an Aural Exciter Type III, Dominator II, and Compellor, among other Aphex gear that he chose for their sonic transparency and ease of use. There is also a TC Electronic M5000 (with two stereo engines), a TC M2000, Korg DRV-3000, and two Yamaha SPX90 II's. A Dynaudio DCA650 amplifier living in this rack powers a pair of Dynaudio BM15 studio monitors that "sound amazing."

One device that sees a lot of action is the Re-amp tape-recorder-to- instrument-amplifier interface. This unit is basically a step-down transformer that matches impedances when re-amplifying a tape track into an instrument amplifier.

LOOKIE HERE

Argosy makes the console housing, which makes the "whoa" factor of the studio go way up. According to Tom, the effect it has on clients is profound. In an area where label execs are accustomed to listening while sitting in front of half-million-dollar consoles, the Argosy/Mackie combination seems to make them feel at home. Technically, it makes wiring easy with plenty of room in cable bins and also allows you to place the audio and video monitors at a proper height.

continued on page 144



WHAT'S LEFT?: The studio's left-hand side.

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THE ZOOM 1204 STUDIO EFFECTS PROCESSOR



Is This Trip Really Necessary?

How to tell if you're a gearaholic when it comes to synthesizers — let the purchases of the past warn us of the future

BY TONY DI LORENZO

Did you hear the bass on that track? I need that (fill in the blank)!/Boy! Those Strings were fat! I need one!/That synth just has a certain something!/Nothing sounds quite like that (fill in the blank)!

If you've found yourself uttering any of these phrases, you may be a gearaholic!

Thanks to current trends in our music industry, the gear of yesteryear has been on a value roller coaster that for now is only going up. Back when programmable polyphonic analog synthesizers were all the rage, you could have easily snagged a monophonic synth like a mini-Moog or ARP 2600 for just a few hundred dollars. I still kick myself for passing on a mini back in the late '80s for \$100! I thought to myself, "It needs a good cleaning and a lot of work. Plus, it's only monophonic."

It looked like the arrival of programmable polyphonic analog synths like the Prophet 5, OB-X, ARP Quadra, and Memory Moog, to name a few, marked the end of the road for mono pioneers like the miniMoog, ARP 2600, and other monophonic analog synths. These poly synths offered convenience to the keyboardist. Thanks to batterybacked memory in these units,

you didn't need to start dialing up a new sound in between songs while the lead singer asked the burning question, "How's everybody feelin' tonight?" The new synths seemed to be the answer to keyboardists' prayers...or were they?

The new machines, although very convenient, were not without disadvantages. Weight and tuning instability made them less than a breeze to gig with and high price tags kept some keyboardists from buying these new synths. A machine like the Prophet 5 had a list price of around \$4000. Think

about it, it was fivenote polyphonic. It wasn't touch sensitive. It didn't have MIDI. It only held 40

patches in memory. Sequencer? No way. But we all wanted one. Many of the now "vintage" synths were in the same price point and had similar features.

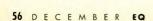
Then a new breed of lighter and cheaper synths that were stable in the tuning department came along and made the pricey polyphonics mostly unnecessary. Synths like the Korg Polysix and Roland Juno 60 helped to change the market again. They were warm sounding, programmable and fairly inexpensive. Now people were selling off their heavy-

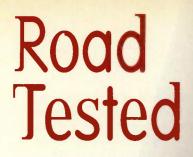
weight keyboards for

these lighter newer ones. Let's not forget about the arrival of MIDI-equipped keyboards like the Prophet 600, JX-3P, and the Jupiter 6. The funny thing about MIDI at that time was only a few people saw its potential and even fewer knew what to do with it, but we all had to have it.

THE PROPERTY OF THE PARTY OF TH

Then right on the heels of this adjustment that we were all trying make along comes the DX7. This was an expressive keyboard for the day. Sounds could change in timbre depending on how hard you hit the keys. We saw this touch sensitivity on analog beasts like the Yamaha CS-80 and Sequential's Prophet T8, but the average musicians who held day jobs until that big record deal came thru weren't accustomed to a touch-sensi-





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tive synth. Now every keyboard player on the gig circuit was thinking, "If I don't get one of those they won't call me anymore," and once again people started getting out from under their old synths. Once sought-after Prophets, Moogs, and Oberheims were unwanted like the guy who wore a leisure suit to his prom. A Prophet 5 for \$500? A T8 for \$750? An OB-Xa for \$400? What about a Prophet 10 (double keyboard) for \$700? These are all prices that were common in the late '80s and early '90s (I passed on a few of these deals).

In today's synth world a few things may be contributing to the upward climb in prices for these older keyboards on the vintage market. Thanks to musical styles like house, techno, rap, and even rock, these former heavyweights are making comebacks. Just turn on your radio. You'll hear some of these older sounds in the newer music. Also contributing to the upward climb in the

prices for these instruments is export to other countries, actual numbers produced (in many cases only a few thousand, giving these instruments a collectors appeal), and the fact that many of the original synthesizer manufacturers are now out of busi-This starts ness. gearaholics thinking, "What if my vintage synth dies?"

In our never-ending quest to stay in fashion, we find ourselves trying to buy gear that we thought ceased to be useful years ago. Now, thanks to this need to be hip and greedy, dealers are specializing in "vintage" gear. Some musicians may consider purchasing a Roland TB-303 BassLine (wanted by techno musicians) for between \$800 and \$1000. Consider

purchasing a TR-909 drum machine for between \$1000 and \$1800. This is more than the machine cost when it was in production.

In these days, where 64-note polyphony is becoming the norm, why would anyone pay between \$1500 and \$1800 for the six-note polyphonic Oberheim Xpander? Why would so many people be willing to pay \$1000 and \$1500 for a miniMoog — without MIDI? Please keep in mind that the original list price for a miniMoog was only \$1495. Let's not forget a synthesizer like the Prophet T8 is only eight-note polyphonic, and, because of its size, is not practical for gigging, yet you may see these selling for \$2500 or more.

If you've been shopping the vintage gear market then you know that people have been asking and getting ridiculous prices for these older pieces. They are simply preying on the weaknesses of gearaholics. Being a gearaholic is not the worst of habits, but there are a few ways to curb this addiction. Before buying any of these older machines you must ask questions. Question the seller — be they a music store or individual just trying to get rid of that keyboard that they don't use anymore. You must also question the buyer (that's you). Ask yourself:

- 1. Why do I want it?
- 2. Do I really need it?
 - 3. Can I get those type of sounds from my current
 - 4. Will this need costly maintenance?
 - 5. Who can do the repairs on this synth?
 - 6. Given the cost of the synth plus any repairs it may need, is it worth it?

Let's say you have three or four other synthesizers, maybe a powerful sampler, and a drum machine, yet you find yourself needing this other piece of gear. You'll need to analyze what is it about this piece of vintage gear that you can't live without. If it has a specific sound that you like, why not try to get that sound with your current gear. Is what this machine has to offer so specialized that it can't be reproduced using some other means? Is there a

synth that is currently available that can give you the same results? Remember those huge multithousand dollar sampling workstations? Sure they were cutting edge 10 to 15 years ago, but their capabilities have been surpassed by today's sampling workstations like the Ensonig ASR-10 or the Kurzweil K2000 or K2500 samplers.

Many electronic musicians feel

that the presence of real-time controllers like knobs and sliders allowed us and even encouraged us to explore synthesis without necessarily needing to know synthesis theory. This is why so many of these older synths have made a comeback. Part of the magic of a TB-303 is the fact that you can edit the bass sounds while this little wonder is playing the bass sequence. Tweak the filter while it's pumping out that new milliondollar techno hit you're writing. Real time control! It's what we all want.

Many samplers available today have extensive synthesis capabilities. Things like filter cutoff or filter resonance could be routed to a controller like your mod wheel or maybe a data slider. Now you could have your sequencer playing your new synth while you pump that slider up and down. opening and closing the filter, working that cutoff frequency and resonance. If you do this right, the track could sound like you used a TB-303. Why not have your MIDI sequencer record the movement of the mod wheel or data slider? Now the sequencer would be making changes to the filter in time with the track.

Do you find yourself saying, "I need those really fat bass sounds?" The miniMoog has become the undisputed "king of bass." Why? Three oscillators beating slightly out of tune with each other to create what we all lust after a "fat" sound. Some currently available synths could produce some very analogsounding patches with the added benefits of modern MIDI implementation and tuning stability.

Be honest with yourself. Will you hear the difference between the Oberheim or Prophet imitations found in a Roland XP50 and the real things, once the track is mixed? If you have a sampler and access to a analog synth, try this little trick: Create a bass sound that you'd like to use in your track. Multi sample it and create a program based on these samples. Once you've done this, layer the same sound over itself and detune it slightly. If you need the sound to be thicker, add a third layer of the same sound and detune this too. If you mix this properly it will work.

Let's talk about drum machines for a moment. Many currently available drum machines like the Roland R8mkII or the R70 have those TR-808 and TR-909 sounds that are very necessary on the dance floor, yet all of us purists have

"Once sought-after Prophets, Moogs, and **Oberbeims** were unwanted like the guy who wore a leisure suit to bis prom."



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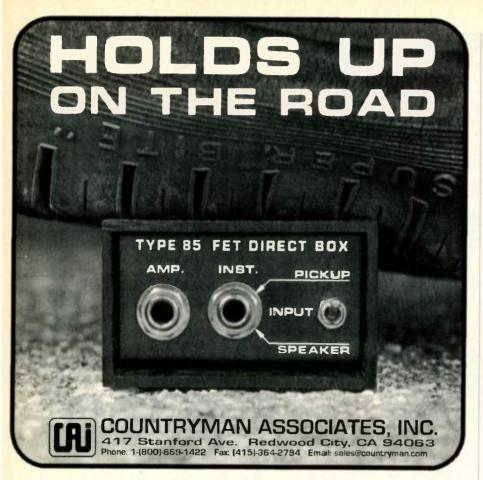
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TECHNIQUES BUYING

to have the "Real Thing." Why? In the context of a track, it is not going to matter if you use the 909 kick from the R70 or the R8mkII or if you use the kick from the real TR-909. Using one over the other will not cost you a record deal. Some fans of these machines feel that other drum machines are just too "clean" sounding and that they need the "grit" these older machines have to offer Think about this: not too long ago people were selling these machines off because they didn't sound "real" enough.

Here is a way to add some "grit" to your drum sounds. Try sampling some of your favorite drum sounds at your sampler's high rate (let's say 44.1 kHz) and save these to disk. Now resample the same sounds at a lower rate (let's say 22 kHz). Compare the fidelity of these two sets of samples. You'll notice that the set of sounds taken at the lower rate may have the "grit" you were looking for. Now go to the filter section of your sampler and start experimenting with different filter settings for the drum samples. This technique will not make a traditional kick drum sound like a 909 kick, but it could be just the type of spice the track needed.

Here's another trick: sample a hihat at a low rate then go to the sample edit page in your sampler and transpose the sample down a few steps (experiment to see what you like). Once you've done this, try experimenting with different filter settings to add that "grit" to the hats. Try to be as creative as possible. Why not set a trend instead of following one?

If you must have an older unit, you should research who can do the repair work on it. Remember that many of the synths that are on the "vintage" list were made by companies that went out of business years ago. If the manufacturer is out of business, you should find out who still supports the synth as far as parts, owners manuals, and service manuals. Many of these "vintage" synths are still supported even though the manufacturer no longer exists. For example, Wine Country is where you can get Sequential Circuits support. Forat Electronics still supports Linn products.

Here is a scenario, you've just found a great deal on a "vintage" synth, let's say a miniMoog for \$500. It needs a little work, and maybe cosmetically it's not perfect, but it's a miniMoog. You bring it to your favorite tech and he says, "It will cost \$250-\$300 to put it in playable shape. Plus you want to get that

continued on page 126



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CIRCLE 94 ON FREE INFO CARD

Paul Is Not Dead !!!

And neither is backward recording

BY STEVE LA CERRA

n the July 1997 issue of EQ Craig Anderton described a method for getting great-sounding analog tape compression for digital recording, using gear that is probably sitting around in your studio. Well, keep the dust cover off that old dinosaur because we're about to find another really cool use for it.

No one can deny that the advent of the digital multitrack has made studio life pretty amazing. But regardless of whether you own Alesis ADAT's or TAS-CAM DA-88's, there is one thing that you absolutely cannot do: record backwards. Now you might be thinking, "OK, I've really had enough of things like 'turn me on dead man' and suicidal encouragement from Judas Priest." But don't forget that there were some other, shall we say, more musical things that you could record - such as backward piano tracks, snare and cymbal hits, reverse reverb effects, and the old favorite: the backwards guitar solo.

In order to make this happen you will need the ability to make your digital multitrack chase to SMPTE code (owners of hard-disk systems need not apply: you have "reverse" under the edit menu). So if you are in ADAT land, you need a BRC and

if you're in DA-88 land, you need an SY-88 sync card. You will also need some kind of 4-track with overdub capabilities; it could either be an open-reel or a cassette machine, and it need not have three heads - an old 4-track cassette Portastudio -type device will work fine. You could also use an analog 8-track (either cassette or open reel), but a 2-track machine will not be adequate unless it's also got a separate timecode track. A SMPTE-to MIDI-interface or timecode generator regeneration capability will be a help, but is not a necessity.

We'll assume that you are in the process of recording a song and have one or two open tracks available. It doesn't matter if you are working on a system including multiple machines as long as there are tracks open (and they don't need to be empty for the entire song). Start by making sure that there is timecode on the multitrack's internal timecode track. For the DA-88, this means that you must record code on the subcode track so that it appears at the rear-panel RCA jack labeled "timecode out." While you don't have to do anything special to get timecode the ability to regenerate code, the digital multitrack will probably still be able to chase lock to the copied code, but I make no promises). Record the timecode onto one track and the rough mix of the original tracks onto another. Remember that timecode should be recorded on an edge track and should be printed at roughly -10 VU. To avoid leakage leave an open track between the two. Now you will be working from the 4-track tape and you can put away the original masters for a while.

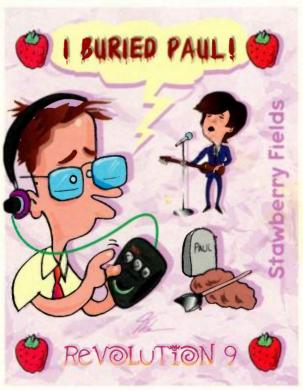
If you are using a cassette format, simply turn the tape over and you can play and record backwards onto your cassette. For an open-reel machine, you can either turn the

> tape over or (on some machines) vou can reverse-thread the tape around the capstan and the reels will run backwards. When you play the tape, you will hear the original tracks backwards. Turn the monitor level on the SMPTE track down so that you don't have to listen to it.

While the tape is in this position, record your "soon-tobe-backward" tracks (which are forward right now). Once you are done, turn the tape over and listen to the tracks. Your mix of the original tracks is now forward and the new overdub is backward. The next thing that you need to do is copy the backward track over to the multitrack master, but you will have to lock the machines together so that your overdub comes in at the correct moment during the song. This is easy. Patch the SMPTE track out from the 4track machine to the SMPTE input on the BRC or the SY-88 and put the digital machine(s) in

chase mode. Route the rough-mix track to an open channel on your mixing console for monitoring purposes.

If you're using a 4-track cassette machine that does not have individual outputs for each track, route the timecode to only the left main output and patch that output to the SMPTE input. Then route the backward overdub only to the right main output and patch that to an open tape track on the digital machine. Then route the rough-mix track



onto your ADAT tapes, you will have to make sure that the BRC is set to generate SMPTE (press GEN SYNC and set SMPTE output level); otherwise, no code will be sent out of the BRC's "SMPTE out" jack.

Next you need to copy the timecode onto the 4-track, but remember you are not supposed to just copy timecode: you really should regenerate it in the process. (You can do this using the SMPTE interface. If you don't have to the 4-track's Aux output and patch that to an open channel on your mixer. When you play the 4-track machine, the 8-track will chase and lock. You will hear a flange effect from the combination of the rough mix and your "real" mix of the original tracks, and you will hear the backward overdub come in at the right time. With the machines locked, record the backward overdub from the 4-track to the 8-track. Since the 8-track is digital, you will not (really) lose any quality during the bounce. Once the backward overdub is transferred, you can put the 4-track away and work from the original master(s). If you need to add another backward track, you can repeat the process but bounce the second overdub to another open track on the master reel(s).

In addition to being senior editor of EQ, Steve La Cerra is also a musician, engineer, and producer. He recently released his first solo album, entitled One Step at a Time. For more information, call 718-449-9415 or visit his Web site at www.mcmix.com/lacerra.htm.

TIPS FOR THE BACKWARD-MINDED

If your analog deck lacks sync/SMPTE capabilities, all is not lost if you're patient - and your 2-track has variable speed and can record each track individually. Record a rough mix on one track, making sure the rough mix has plenty of material before the backward section comes in, and follow Steve's instructions to record the backward track. When transferring the backward track to the digital deck, cue up both decks to the beginning, monitor the digital tracks along with the rough mix, and start the machines simultaneously. Unless you're insanely lucky, there will be a timing mismatch (as evidenced by echo or flanging). Adjust the 2-track's variable speed until the two machines "catch up," then immediately turn off the variable speed to return to normal speed. The two decks should stay in free sync long enough to transfer the backward part.

A problem with recording backward parts is knowing where to stop and start, since you'll be overdubbing while manitoring a reversed rough mix. Try this: when transferring the rough mix of the original tracks to the analog deck (at this point, you're still playing them forward), mix in a countoff using a very short, sharp sound (e.g., clave). Suppose you're recording a guitar solo. Starting on the first beat of the solo, add 5 clave clicks, one on each beat. Do the same starting on the last beat of the sale.

As you monitor the backward premix and approach the end of the solo, you'll hear four clave clicks, then the end of the solo on the fifth click. This is where you start playing. Keep playing until you hear the next set of clicks. I usually play what will become the first note of the solo on the first click, let it fade out, then mute the string on the fifth click. Then, when the tape plays forward, the guitar solo starts on the first beat of the solo and fades in. plays, then ends right on the last beat of the solo.

Finally, remember to think backward: play the most intense and higher parts first, then mellow out over the course of the solo. When reversed, the solo will progress from mellow to intense. For an example of this, check out the song "Next Number" from the CD Mandrake Memorial (Collectables COL-0691, Box 35, Narberth, PA 19072). — Craig Anderson



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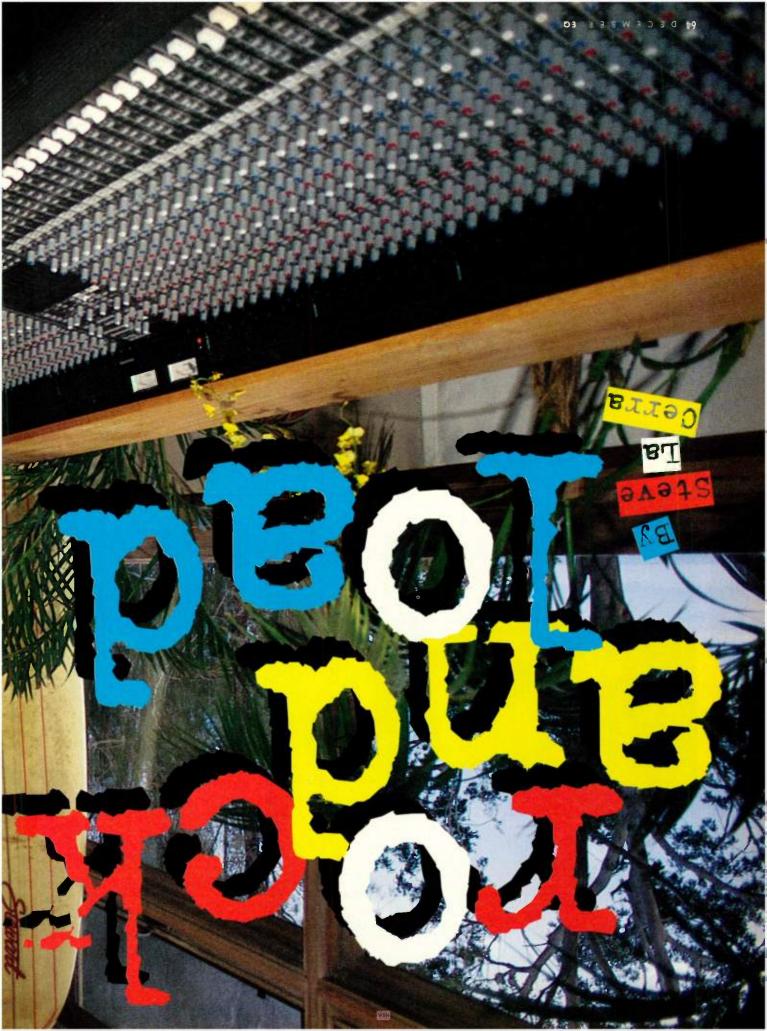
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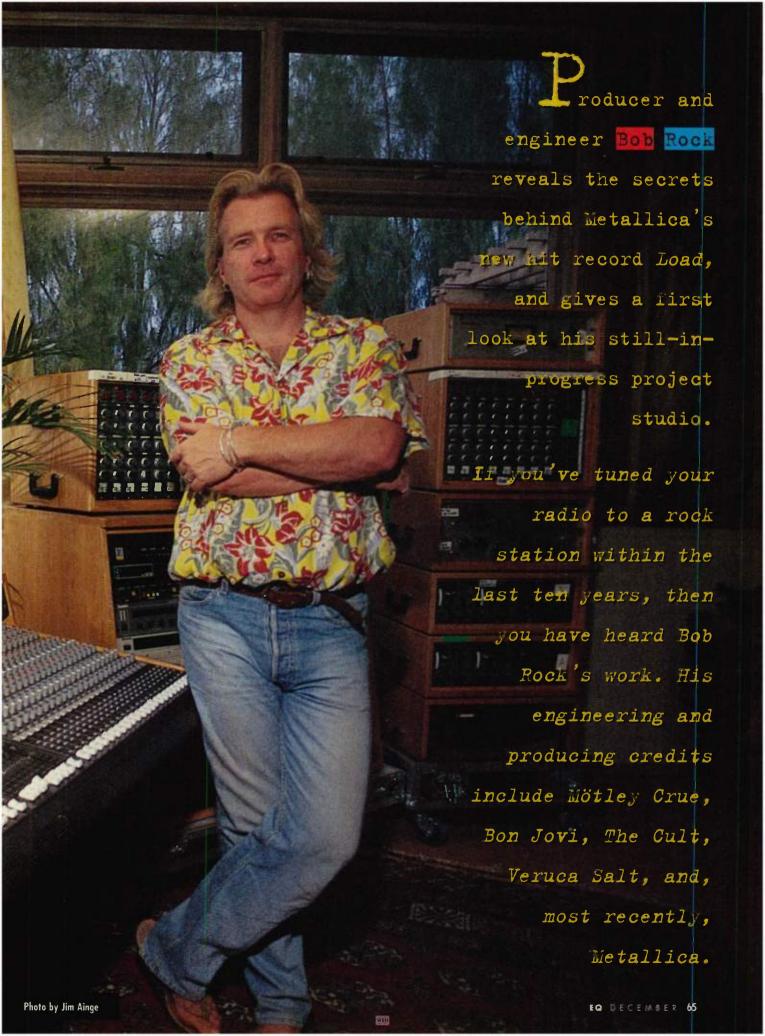
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Load, is Rock's second successful effort with the metal mavens, and Bob took some time to tell EQ about the making of that record.

EQ: Where was Load recorded?

Bob Rock: We recorded at The Plant in Sausalito, CA after some pretty extensive work to the studio there. The old Studio A was built during the '70s and was very dead with a low ceiling. To accommodate Metallica they raised the ceiling up to around 20 feet high. They didn't really have the volume to open up the sides of the room, so they went up. When we started, the room was completely live — a lot of stucco, a hard-surfaced floor, and hardly any wood at all. My engineer Randy Staub and I thought that we'd start with a live room and then by bringing in baffles and sheets of plywood, we could form the acoustics around what we were trying to achieve. It worked out quite well.

Did the rhythm tracks go down live?

The rhythm tracks all went down live. Before the *Black* album, Metallica had never really all played in the studio together. For the *Black* album, we started doing it that way and then for this album they came in knowing what to expect.

What did you record to?

We recorded the floor tracks (i.e., the live rhythm tracks) to a Studer A800 onto BASF 468, which is basically the same as AGFA 468, since BASF bought that company. It's the tape that I have used for many years and I love it. Actually, BASF was very helpful and they ran a batch for Metallica. I think we bought 300 reels or something like that. It was the regular formula of 468, but we wanted the reels to be from the same batch for editing purposes.

Did you use all those reels?

We ended up pretty close. We cut about 30 songs and kept everything. Metallica has come into this "recording off the floor" thing, and they realize how much they like the energy and the little nuances

that happen -

they are pretty committed to it. And I am pretty much committed for drums and basics going to analog, rather than straight to digital. We recorded everything to the 24-track Studer at 30 ips, NNR. From there we dumped everything to a Sony 3348 to archive exactly what came off the floor (from analog) so we could come back if we need to. If it's a basic guitar track or a solo track that Kirk did, or a vocal idea, it's there at all times. We'll never erase it. Then we proceeded to edit and overdub.

Did you edit between the transfer from analog to digital?

No, we edit in Pro Tools III. We lock Pro Tools to the Sony 48 using a MicroLynx, and rather than dump 24 tracks to Pro Tools, we phase-lock it to the Sony and load tracks in eight at a time over three separate passes. Then we do our edits in Pro Tools and dump the tracks back from Pro Tools over to the Sony 48. It's a system that I have used for years and it

works without problems. From there we slave an analog reel for all of James Hetfield's and Kirk Hammet's heavier guitars and solos. For vocals, bass, and any clean guitars, acoustics, etc., we use a second (slave) 48. I've got the best of both worlds: I am one of these guys

that loves digital for what it does and I love analog for what it has done for me for many years.

Did they cut to click?

I would say about 60 percent to click and the rest was free. Some of the choruses may have lost something if we stayed at the same tempo, so we might either raise the tempo of the click in a spot or, if it still didn't work, we'd free-track it. I'd be behind the console starting and stopping the click, and if there's 10 or 12 takes of a song, it helps us edit.

Were you doing that many takes of each song?

Over 30 songs, every one has it's own story. But generally after the band played it four or five times the song settled into a groove, and there was a group of three or four takes that were excellent. Obviously, there might be a mistake or a few fills that were spectacular on a given take, so we would assemble those particular ones on Pro Tools. But then on other songs we'd use one full take and then take just a "B" section or a bridge from a different take.

THE HOUSE THAT ROCK BUILT

A look inside my still-in-construction project studio BY BOB ROCK

I live in Maui now, and for almost the last ten years I have been traveling quite a bit. Moving over to Maui, I realized that there are no facilities here and didn't want to be off-island the whole time. I always want to work, but I also want to stay close to my family. I have to do this so I can work here.

I have a collection of Neve stuff, 40 1081 modules, and I have been collecting studio gear for the last 20 years. But I always have wanted my own mix room, and that is what I am assembling here. I have a complete mobile studio much like what Bryan Adams has and used on his last album. The studio has the 40 1081 Neves input and a Mackie 56-input console for monitoring. I used that gear to do the Veruca Salt album. I also have an SSL-style patchbay so the Mackie is completely patchable. Starting next week, I'm building in a full-blown mix room, modeled and styled after Little Mountain's mix room B, which I love, and the mix room in A&M, which I also love. I'm putting in a 72-input SSL, but I haven't decided whether to bring in a 6000 or a 9000. The 9000 is a wonderful console, but it's new to me and I have been using the 6000 for such a long time. That's the big question: 6000 or 9000?

It'll be an overdub and mix room. I could track at my house — there's enough room here, but I wouldn't bring in Metallica here to track! Obviously for that kind of thing you need a big studio because they have so much stuff. But hopefully we'll be doing some overdubs and mixing here. Jon Vrtacic is wiring and designing the room. He was the head tech at Little Mountain and he made that studio. None of us at Little Mountain could have done what we did without him. He's building it from scratch, and in the spring we'll make the big decision about the console. I'm very excited about it.

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CIRCLE 74 ON FREE INFO CARD



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CIRCLE 23 ON FREE INFO CARD

Lars's drum parts in "Until It Sleeps" sound either looped or programmed, particularly the verse. Was it a part that was cut and copied?

Lars was adamant about getting that little snare roll right. If you listen, it's very repetitive, and to get it consistent would be difficult. We found the best of the verses and then replaced the ones where there might have been a missed hit or something. Lars really liked the sound of certain things, and our editing system allowed us to use them. As a matter of fact, "Until It Sleeps" was the one different track from the whole album. While we were recording, the band jammed on this one little thing. I thought we should lay it down. They were freaking a bit, saying, "What do you mean lay it down?" I said, "Let's just spend an hour and lay a whole pile of takes of this." So we did that and left it. Lars came back after listening to it and thought it was a cool idea.

We kept the original idea but obviously it was not complete, so there were some edits. To keep the original feel which was magical - we had to add the other parts to it, and by recording multiple takes you can do that. Most musicians will tell you, "When I did the demo it had this great feel..."

The magic demo feel...

The magic demo. And so many times I have tried to copy that. Now we can use technology to keep the demo and the magic. The other song that was different was "Mama Said," with the B-Bender guitar. When we cut it the first time, it came out as a big power ballad and lost a bit of character so we cut it again which they've never done. We recut it with just Lars playing these sticks that are like a bunch of small dowels wrapped together and James playing acoustic guitar. We got a great take and built on it. These guys have opened their minds to different ways of recording so it was a real great experience. There's quite a few songs leftover that are really top notch.

Did you take those songs through to completion and mix?

They are in a basic state. Some of them are overdubbed, but there came a point in time where everybody said that this would either be a 30-song album and take another year to complete or they could go play. So they said, "Let's go play." They took the songs from that point that they wanted to put out and that is the album.

Was James Hetfield using a handheld mic to record vocals?

I think that there have been great strides in recording approaches in the past few years. Achtung Baby comes to mind as a record that had a particularly big effect on everybody, especially me. Lillywhite, Lanois, Eno, and Flood - as far as I'm concerned, they should be in the hall of fame. After hearing about Bono's approach we brought James into the control room for the Black album and realized that he sang better with speakers than with headphones. So we took it one step further, brought him into the control room and gave him a handheld Shure SM7 to sing into. It was really like we were in the living room. James was right beside me with his lyrics. He had a set of Auratones on stands for monitors, while I'd listen through the Yamaha's on the console. The volume was kept down and the leakage was pretty nonexistent. If you really listen closely, you can hear a bit. But the result in terms of the performances were leaps and bounds better because lames was so comfortable. He said that it was the easiest time he has ever had, and I think that they are the most confident vocals he has done. Obviously there were a couple of songs (like "Mama Said") where it didn't work because we needed the proximity and for the vocal to be sweet, so we ended up using a tube '47 out in the studio with headphones.

How did the vocal sound for "Poor Twisted Me" come about?

There's a bit of distortion on that vocal and we were wary of bandwagoning this because everybody is doing distorted vocals these days. Paul DeCarli, the guy who did the digital editing for us, is a harmonica player. He'd sit there at Pro Tools and every once in a while he'd grab his harmonica and play a blues lick. He had a Shure Green Bullet mic sitting there in the control room and at some point James was forming the lyrics for "Poor Twisted Me," and we said, "OK, let's do a quick vocal with that mic." That was it - that was the vocal take, one pass and it was distorted. It's almost like I didn't tell the band I was serious about doing it. It was more like, "Just grab that and we'll redo it later." James listened back to it and liked it, everyone thought it was cool, so we kept it. It's not really distortion, it's just the nature of the mic.

In terms of the mix, the drums and guitars are really loud and in your face, but they never step on the vocal. How do you make that happen?

Through the Black album and through Load as an extension of that (but obviously with different sounds), Randy Staub and I have come up with a bit of a method: The Black album was mixed

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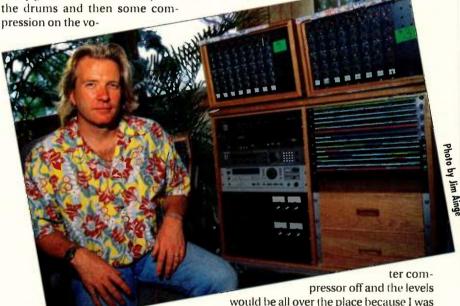
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CIRCLE 70 ON FREE INFO CARD

on the SSL 6000 at A&M's mix room, which is a beautiful room. This time we used the SSL 9000 at Right Track.

Basically, when I did my regular thing with mixing on Black, James didn't really like the way the guitars would get sucked back by the compression every time the drums hit. I tried to explain that when I don't compress the drums, I don't get the sound that I really like - I like drums that you feel and that have a lot of snap. So we did our normal mix on the drums and bass and put them on the A bus, put guitars on the B bus, and the vocals plus maybe a guitar solo on the C bus. [Editor's Note: The SSL console has three separate stereo busses, A, B, and C, which can be routed in any combination to the main "program" stereo output.]

There was no compression on the heavy guitars, but lots of compression on the drums and then some com-



cals. These

mas-

would all go to the master bus, and that was our mix. Through the process of mixing the *Black* album we somehow mis-bussed something...like the drum overheads were going to the A Bus *and* to the C bus for some odd reason. What was happening was that the cymbals were being really compressed, but we also had a touch of the plain, uncompressed cymbals.

Which left the top end there.

And we thought this was cool and by the end of the *Black* album we really had a feel for it. When we came back to mix *Load*, we took that and played with it more. Now it is an interesting set of circumstances. It's great when you can have a snare that is really compressed and then on another bus you have the snare without compression — you add a little of that and there is some nice air to it.

Would you also use a compressor across the main stereo output to the mixdown deck as well?

On some of the albums that I did, like Dr. Feelgood and some of the Cult stuff, I compressed quite heavily - that's what a lot of guys were doing at the time. There's pluses and minuses, but for the most part it always worked. This new technique kind of opened my eyes and I backed off the compression on the master bus to almost nil. There's a couple of songs from Load where the master bus has no compression. A couple of times we added, maybe 1 or 2 dB of compression. Randy and I would flick it in just a bit. But I used to slam it up 4 to 6 dB of solid compression. And I'd be mixing my levels to it. On some of my old mixes from five years ago, I'd take the

pressor off and the levels would be all over the place because I was actually mixing to the compression. The other thing that we did was add a GML EQ between the SSL compressor and EQ the A bus with a master EQ to add a little overall top end after all of that compression. It's almost like master bus EQ, but it's actually just on the A bus, just the compressed drums.

What compressors did you use? I own some of the SSL rack-mount compressors.

What were you mixing to?

We mixed through Apogee converters (with soft compression) to Panasonic DAT machines.

How do you get Lars's kick sound? Now there's an interesting thing. That is definitely Lars's thing — he loves the top. It's pretty much down to the basics: drum tuning, mic selection, and placement, and continued on page 126

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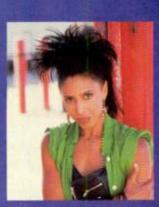
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Rind of

Once again, a band of tired and jaded EQ editors select the best of show products at the recent AES in Los Angeles



Get this straight. This ain't no TEC Awards. We're not giving Bob Clearmountain his umpteenth trophy for being the most recognizable name behind a mixing console. We're not polling a popularity contest among our readers. We're, once again, giving our editors'

picks for the hot new stuff on display at the AES in October.

Don't get us wrong. We take our annual votes seriously. But there's really nothing scientific about the process. Here's how it goes:

- (1) First, warn 15 editors and writers that they are expected to attend an end-of-show meeting and that they better be prepared to submit their Blue Ribbon nominees.
- (2) Then, sit around a big table in a late-night restaurant where everyone tosses around their suggestions.
 - (3) Frantically scribble down notes.
 - (4) Interrupt the process for a food fight.
 - (5) Interrupt the food fight for a hot round of gossip.
 - (6) Reject half the suggestions and add a few more.

Okay, so this ain't the Academy Awards. The annual EQ Blue Ribbons are a coldly subjective effort by our writers and editors to put some perspective on what was hot and happening at the most important project recording and sound show of the year. Live with it.

THE PERFECT MIX

Frankly, it wasn't a big show for consoles. The big boys (SSL, Neve, Euphonix) were repackaging their old boards to reflect the fact that these days most console changes are invisible software updates anyway. Mackie and Soundcraft never showed their anticipated project studio digital boards. So who gets this year's plug? Yamaha continues to fill all the niches on the low-cost digital console front with their little brother to the 02R,

the 03D; it'll cost about \$4000, it comes with 26 inputs, and is intended to make life easier in the postproduction suite with LCRS surround sound capabilities and an RS-422 interface. Meanwhile, TASCAM threw its hat in the ring with their first digital board; sure it was only a prototype, but its friendly and familiar touchy-feely control surface, its internal DA-88 interface, and its under \$10,000 price tag warrants an award for taking an especially sensible approach to low-cost digital designs.

Meanwhile, Digidesign also deserves some kudos on the console front for upgrading Pro Tools digital mixing capabilities substantially with its new 4.0 software release. It looks better, carries new automation features, and includes new fader grouping features. Last but not least, we need to give a personal award to Rupert Neve, who was pitching away with a fervor at the AMEK booth — yes, he's back!

DISK AND DAT

MD (MiniDisc or MagicDemo?) swept the show on the



recorder front; you've read about these new notebook recorders from Yamaha, TASCAM, and Sony before. What you may have missed is that these are not just replacements for personal recorders. Every studio — from project to platinum — is going to own them by the dozen. (Stevie Wonder was by the Yamaha booth and picked up three.) This is only the beginning of ways that MD will begin to infiltrate the recording scene. Meanwhile, at the HHB booth they were showing a production model of the Genex GX8000, which offers 8-track recording on a removable magneto-optical disc. Akai showed its newest 8-track digital recorder, the DD8, a random-access digital audio dubber that features an onboard 2 GB hard drive or an optional 2.8 GB magneto optical drive; it is data compatible with the Akai DD1500 recorder editor.

Meanwhile, a platform and operating system-independent DAT-to-CD-R conversion and editing system was introduced by Microboards Technology. Their AD Maker creates Red Book audio glass-master ready discs from

both edited and unedited DAT tapes; it comes with a 4X CD-recorder, high-density DAT tape drive and two SCSI channels, and allows simultaneous duplication of up to 16 discs. Speaking of DAT, Pioneer had no profile at the show, but they are making a mark for themselves with three OEM-provided, low-cost DAT machines for TASCAM (DA-20), Fostex (D-5), and Otari — so we figure that's worth a Blue Ribbon show-or-no-show.

MORE DIGITAL STUFF

Digidesign, as you've already read, continues to dominate the workstation scene, but there were some alternatives worth noting. Digital Audio Labs was showing off their long-awaited V8 multitrack digital audio workstation for PCs; it is capable of recording and playing up to 16 discrete tracks, includes an upgradeable DSP architecture, and offers a wide variety

Kind of Blue



of input/output options including ADAT and DA-88 interfaces. Digital Wings from Metalithic Systems made its AES debut with its Windows 95 digital audio recorder; the system provides 128 tracks of hard-disk recording, incorporating a slew of DSP; it's inexpensive (about \$1700) and has an ultracool-looking multimedia interface.

Sound Forge 4.0 also continues to gather steam with the viability of the Windows platform and with growing third-party support (including the Waves AudioTrack plug-in) and new sound design possibilities for the Internet with its sup-



port of RealAudio and Java file formats, Also, worth noting are keyboard makers Kurzweil and Korg's continuing efforts to make a name for themselves as pro audio workstation makers. Kurzweil displayed their long-awaited

DMTi (Digital Multitrack Interface), which allows their keyboard to talk directly to any ADAT, DA-88, or other digital audio recorders, creating a cost-effective alternative to the now-classic Synclavier digital studio environment. Korg's SoundLink Digital Recording System is a building block approach to building your own digital audio studio, with six

components: the 1212 I/O, the 168 RC console, monitors, amplifier, and A/D and D/A interfaces. Owners of their Trinity music workstation can easily integrate the keyboard into the system. And who says workstations need to cost megabucks — Hohner Midia's Samplitude turns your PC into a multitrack hard-disk recorder for under \$400, allowing virtual projects of up to 16 mono (8 stereo) tracks, supporting up to four sound cards for eight discrete outputs during playback.

IN THE PROCESS

What else could possibly be new and exciting in signal processing? Lexicon's MPX 1 is the latest in a line of processors that carries the company's pedigree but fits within the cost-effectiveness criteria of the LXP series. Up to five simultaneous stereo effect programs may be used, including reverb. One chip is dedicated solely to the reverb and ambience features while the rest of the effects are handled by a second DSP, maximizing sound quality and DSP power. The much awaited production version of Penny & Giles' multichannel Audio Multiprocessor made its appearance; this "little old fader company" has taken a unique approach to signal process-

ing with this box, with each type of processor existing only in software and the system able to hold several types of processing in memory at one time; a range of Pythagoras Audio Software programs allows processors to be inserted at any position in any signal path with all routing also under software control.

Meanwhile, Power Technology announced their 1.2 version of its DSP•FX software release, allowing users to control multiple cards installed in a single PC or a rackmount FX-Pack system. The new software version adds support for multieffects processing and AES/EBU signal transfers to the systems' 32-bit effects processing. dbx should also be commended for making a bid for a chunk of the upscale studio signal processing market with the introduction of their new Blue Series, which includes the 786 mic preamp, 160S stereo compressor limiter, and the 704 A/D conversion system. And easy-to-miss but certainly worth a serious audition is the new STC-8 discrete Class A stereo compressor-peak limiter from CraneSong; the unit is engineered for musical transparent gain control but is also capable of emulating vintage equipment and creating several interesting new sounds.

SPEAKERS OF THE HOUSE

What more can they do with loudspeakers until digital transducers make their move? Several new products indicate that there still is room for improvement. Probably the biggest introduction at the show was IBL's DCD driver technology; the product reduces the amount of steel in a driver due to a combination of neodymium construction and an innovative voice coil implementation that improves performance while it reduces the drivers' weight. Otherwise on the speaker



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front, Electro-Voice deserves kudos for bringing back the tried-and-true Altec Lansing brand name with their first new PA speaker cabinets in years (decades?), and Mackie is moving into the crowded nearfield monitor market with their HR824 studio monitor (which actually sounded quite good in on-the-floor tests). Trendspotters noted the influence of the workstation and multimedia audio studio on loudspeaker design with the introduction of Genelec's 1029 closefield system and Event's new Tria triamplified workstation monitor system.

MORE COOL NEW STUFF

Defying standard categories were several other cool new debuts: beverdynamic introduced their MCD 100 digital condenser microphone: the products are still in beta test but they should be available for mic stands everywhere later in 1997. Hot House introduced a line of control room amps, called the High Resolution Series, with four models ranging from 400 to over 2000 watts. And for shipping audio around the studio or around the world, two new technologies debuted: QSC's RAVE! (Routing Audio Via Ethernet) uses inexpensive Ethenet hardware and twisted pair cabling to deliver up to 80 channels of audio, and a start-up named Liquid Audio introduced a series of Internet delivery software products for consumers and professionals.

Bored with test equipment? Check out Audio Control's new lasys, an idiot-proof electro acoustic analyzer that tells you where to set the crossover point, the crossover level, the limiter, and delay without impossible-to-read 3D charts and graphs (somebody finally figured out that pro audio engineers aren't rocket scientists - fortunately). Finally, we can't ignore a major introduction by Analog Devices of their new SHARC DSP, a powerful real-time music synthesis and effects technology, which promises to reduce the size, power, cost, and development time requirements for a host of future MI and pro audio products. Their new chip consists of innovative multitasking music and audio software, including a library of more than 300 music functions - you should find it buried inside some magic black box this time next year.



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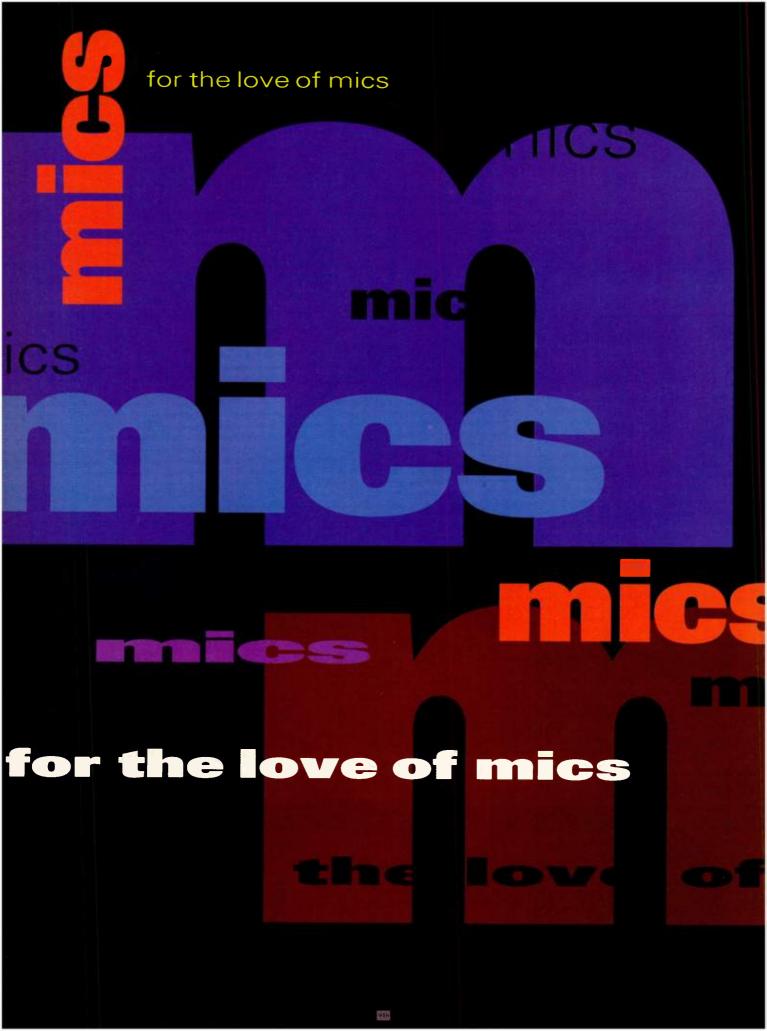
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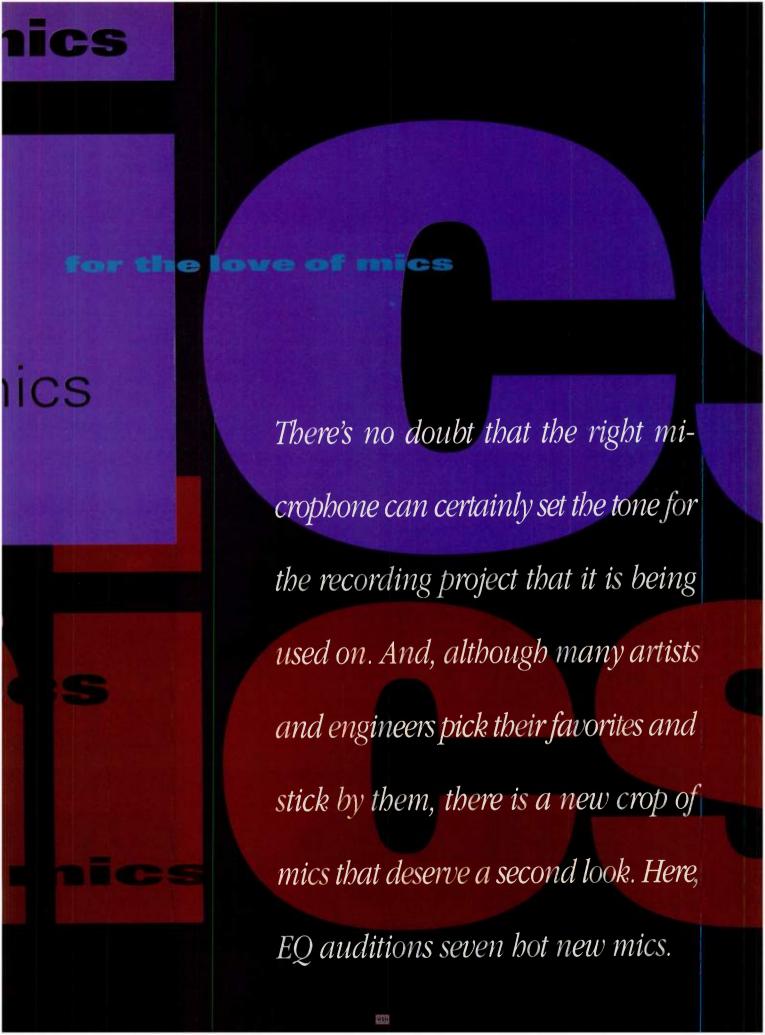
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GREEN RANGE





BEYER MCE 83

Another recently introduced microphone from beyerdynamic is the MCE 83, which was designed as a more affordable alternative to beyer's well-established MC 713. The MCE 83 is a small-diaphragm condenser mic with a list price of \$349, including a padded bag and a beyer MKV8 clip-style holder.

I used the MCE 83 to record lead vocal, backing vocals, acoustic guitar, snare drum and toms. For male lead vocal, the MCE 83 sounded thin; the small diaphragm did not capture a sense of the size of the vocalist like a mic with a larger diaphragm might. Interestingly, this same characteristic made this microphone shine on backing vocals. The natural low-frequency roll off made massed voices crisp and they fit easily into the mix without taking up too much space. On snare drum the MCE 83 also sounded crisp, but by placing it close to the drum I was able to get enough proximity effect so that the body of the drum was as audible as the smack of the stick hitting the drum head. The MCE 83 handled the high SPL from the drum without a glitch, and even survived a direct hit to the body from a errant drum stick.

The MCE 83's output is hot. Since it doesn't have a built-in pad, you do need to be careful about overloading the input side of your mic preamp — particularly when miking drums. The high-output level, however, will enable you to keep the noise floor low during recording. This was a considerable strength when miking an acoustic guitar. If the guitarist played softly, I didn't have to crank the gain — and thus the noise — of the mic preamp. —Steve La Cerra



BEYERDYNAMIC MC 833

With few exceptions, a microphone is a microphone. Sure, operating principles and polar patterns vary, but there really isn't much variation on the theme. Even mics containing two capsules — either stereo mics or multipattern mics — are pretty common nowadays. That said, when was the last time you saw a stereo microphone with three built-in capsules? Have a look at the MC 833 from beyerdynamic.

The MC 833 is a stereo mic with a

rather odd-looking, wedge-shaped head containing three elements that combine to make either an X-Y or an M-S stereo configuration. Output from the MC 833 is via 7-pin XLR connector, so beyer furnishes an adapter cable that plugs into the mic and terminates with two "normal" three-pin XLR connectors. A clipstyle holder (MKV11) is supplied with the mic or you can optionally purchase the EA 833 shock mount. Bever ships the MC 833 in a foam-lined plastic case that has wells for the mic and the abovementioned accessories.

The MC 833's head contains three identical microphone elements (the same as beyer's CK 703 capsule). One of these capsules is fixed in a forward-facing po-

sition (i.e., the diaphragm is perpendicular to the length of the mic) and the other two are positioned on either side of the center capsule. These two outside capsules are mounted on a hinged metal frame and can each be moved from 90 degrees to about 30 degrees from the center capsule.

The microphone operates in two modes: X-Y and M-S stereo configuration. A small tweaker — or screwdriver-operated switch — on the top of the mic selects between the two. A larger (plastic) screw adjusts the position of the mic elements in either configuration Screened on the top panel is a guide for adjusting this screw, with a white scale for M-S angles and a red scale for X-Y (both of which were quite accurate).

Achieving a proper X-Y stereo pat-

tern from this mic is a breeze. Set the mode switch to X-Y, adjust the capsule position, and then simply take the left XLR output to one track and the right XLR output to a second (these should be panned hard left and hard right). I have a couple of gripes about the adapter cable: first, the 7-pin XLR connector required too much pressure to fully mate with the mic body (I was afraid of breaking something), and, second, the pigtails on this adapter are marked "2" and "4." How about "left" and "right" or "center" and "sides"?

Making the M-S pattern happen is

a little more involved because you will have to "resolve" the output from the mic using either a console or some kind of matrix processor box (see sidebar for a full explanation). In M-S, the outputs deliver a middle signal and a side signal not a left and a right. Beyer's literature states that no external matrix is required for decoding M-S, but this is not the case - so don't expect to be able to record in M-S without decoding.

Using the MC 833 in the studio helped simplify my life on a rhythm-tracking session. I used the mic overhead in X-Y mode on cymbals. It was good to use just one stand and not have to worry about positioning between two sepa-

rate mic bodies. With the MC 833, you won't have to fool around for days positioning mics (and getting them to stay there) to form a coincident pair. Basically, it was "point and shoot" for perfect coincident position for the entire three-day session. Cymbals had plenty of sparkle and I noticed that I could really hear the decay of the crash cymbals - something that not all mics can translate. As I expected, imaging was rock solid and phase response was excellent - the position of the ride cymbal and hihat was clearly defined and I never heard any swishy-sounding crash cymbals.

I used the MC 833 on a variety of instruments and generally the mic had a natural, well-balanced tone. Imaging was great in either mode, and it was so







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M-S STEREO MIKING TECHNIQUE

The M-S or Middle-Side stereo miking technique is wonderful for situations where you want to achieve a realistic representation of room ambience. It is most effective in larger (live) rooms where you can get the mics at least 10 to 15 feet away from the source and the side walls. You will need one figure-eight mic and either a cardioid or omnidirectional mic, or a stereo mic such as the beyer MC 833. The cardioid (or omni) mic is placed directly facing the sound source, and the figure-eight mic is turned 90 degrees off-axis from the sound source (i.e., so that it faces the side walls). If you are using a stereo mic, then just face it towards the front of the room.

In order to create the illusion of ambience, M-S technique relies upon a bit of acoustic mathematics — but you don't need a calculator. The output of the figure-eight mic must be added to that of the center mic and panned hard to one side. Then the output of the figure-eight mic is *subtracted* from that of the center mic and panned to the other side. To do this, bring the center mic up on a console channel and pan it to the center. Then route the output of the figure-eight mic to two channels on the console (how you accomplish this depends on your console and patchbay). Pan one hard left and the other hard right. Reverse the phase of one of these channels to create acoustic subtraction and achieve the M-S effect. Then assign the three channels to two busses and route the busses to your tape machine. M-S can also be achieved without a console by using an external matrix processor between the mic and the tape machine. The processor will take care of the mixing, panning, and phase reversal. —Steve La Cerra

easy to experiment with mic placement — I didn't have to waste time reorienting two separate mics into the coincident pair. Mono compatibility was excellent and I never heard any phasing problems. You can vary the balance between direct and ambient sound in MS mode simply by raising or lowering the level of the "center" channel. You will notice that the output from the "sides" cable (the one with the yellow tag) is a touch lower than that of the center. This is simply because the side elements are getting their signal indirectly.

In outdoor situations, the MC 833 was very good for recording nature sounds and ambience. It is quiet enough to handle the task, though you will need some kind of windscreen for all but the most still conditions. At \$2599 (or \$2799 with case and shock mount), the beyerdynamic MC 833 ain't cheap, but it delivers the goods where true stereo recordings are concerned. Sound designers in particular will find this mic paired with a portable DAT recorder an extremely useful tool for capturing sounds. And studio engineers will like the fact that their mic array is easily movable with consistent results.

-Steve La Cerra

PRICE: \$2599; \$2799 with case and shock mount. MANUFACTURER: beyerdynamic, 56 Central Avenue, Farmingdale, NY 11735. Tel. 516-293-3200. Circle EQ free lit. #120.

CAD EQUITEK E-100

The Equitek E-100 from CAD is a supercardioid condenser microphone intended for use in recording studios and sound-reinforcement applications. The E-100 employs a medium-sized diaphragm, which, according to CAD, is

capable of flat response down to 10 Hz (!). CAD includes a warning note with the E-100 cautioning users about its high output and extended lowfrequency response. While it would normally phantompowered, the mic contains a pair of NiCd batteries that can power the unit for up to six hours in situations where

phantom power is not available. There are switches on the front panel for On/Off, Low-Frequency Roll-Off and a 20 dB Pad. The unit mounts to a mic stand via an integral swivel-type stand adapter. Although a shock mount is not available, the mic features an internal "H"-frame suspension that isolates the

diaphragm from both the mic casing and the external surroundings. The E-100 comes in a foam-lined, hard-plastic carrying case that should protect the mic from most abuse.

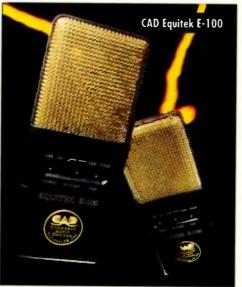
CAD sent EQ a matched pair of E-100's that came with frequency response test strips showing that the two mics were within a dB or two of each other from 10 Hz-18 kHz (in use, I could not detect any audible difference between the two mics). The first test of the E-100's was overhead miking of a fivepiece drum kit. Given the extended lowfrequency response of the E-100's, I decided to use only four mics for the entire kit. The E-100's were placed approximately six feet apart and four feet high facing the kit and turned very slightly inward and downward towards the snare drum (the Pad and Low-Frequency Roll-Off switches were left out-of-circuit). The kick and snare drums were close-miked with an AKG D-12E and a Neumann KM-84, respectively. Rather than build the drum kit from the bottom up (starting with the kick drum, then adding the snare drum, etc.), I began with the overhead mics and then added the kick and snare mics as needed.

The E-100's provided plenty of bottom end — low frequencies from the toms were full and round in spite of the fact that they were not close-miked. Adding in the D-12E and the KM-84 gave just the right amount of punch and immediacy to the kick and snare. Cymbals

were clear and bright through the E-100's, and the mics did a good job of translating the room's ambience.

Another test for the E-100 was a backing vocal session where I connected the mic to a TL Audio Tube Compressor and then ran the output of the TLA directly to an Alesis ADAT. The two back-

ground vocalists were within about one foot of the mic, and the E-100's high output was immediately evident — it required less gain than usual from the TLA unit. This mic is indeed capable of transmitting very low frequencies and the Roll-Off switch was needed to filter out plosive sounds from the vocalists. The E-



100's internal suspension must be doing a good job because even though the mic can reach so low, transmission of noise via mic stand was rarely noticed.

After learning some of the capabilities of the mic, I decided to use the E-100 to close-mic some drums. In this situation the mic's output screams, and the pad was necessary to prevent overloading the preamps on an AMEK Einstein, a Soundtracs Solo MIDI, and a Mackie 8-Bus. You'll have to watch your monitor levels as well, because the E-100 can reproduce a kick drum that will launch your woofers into orbit (you may even need to remove some of the low frequencies).

Due to the mic's proximity effect, close-miking a floor tom added even more low-end impact than distant-miking, while maintaining crisp high frequencies

At a list price of \$400 (and a street price even lower), the Equitek E-100 is worth checking out, particularly for project studios that don't have the budget to buy a large selection of microphones. The E-100's broad frequency response and high output make it an effective choice for a variety of situations.

—Steve La Cerra

PRICE: \$400

MANUFACTURER: CAD (A division of CTI Audio, Inc.), 341 Harbor Street, Conneaut, OH 44030. Tel: 216-593-1111. Circle EQ free lit. #121.

EARTHWORKS TC30K

Earthworks is not the first name that comes to mind when one thinks of microphones, but the man behind Earthworks might be more familiar. David Blackmer played an active role in console development at API and went on to be the founder of dbx. Now Blackmer has built a mic, the TC30K, with timecoherent response from 9 Hz up to 30 kHz. Earthworks feels that clean impulse response and time coherency (see sidebar) are crucial to a mic's ability to accurately reproduce sound. The design goal of the TC30K was to offer serious recordists a microphone with exceptional sound quality at an accessible price.

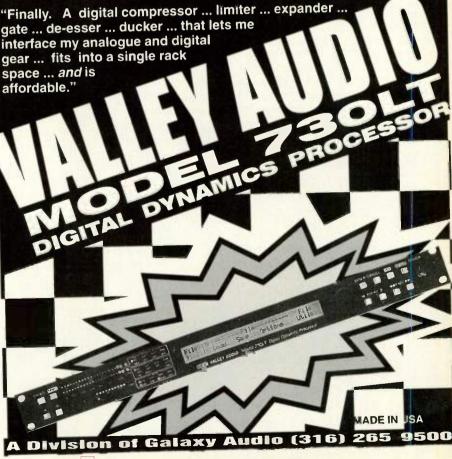
The TC30K microphone is an omnidirectional condenser housed in a slick-looking stainless steel body that makes it look like some kind of medical instrument or a laboratory measurement microphone. Earthworks supplies a clip-type holder, and if you purchase

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TIME COHERENT MICROPHONES

Every microphone has a characteristic "impulse response" — the manner in which it behaves after the sound source has stopped. Ideally, the diaphragm would cease moving as soon as the sound ended, but then there's that physicsthing about bodies in motion wanting to stay in motion. Also, the diaphragm itself resonates, as do any cavities around the mic element, all of which contribute to the coloration and smear the arrival time of various frequencies. By using a very small, lightweight diaphragm housed in a body that has a minimum of resonance and reflective surfaces, coloration is reduced.

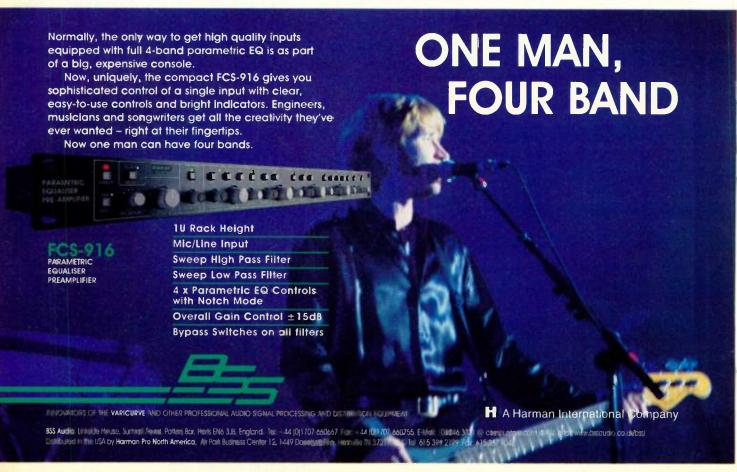
Earthworks microphone designer David Blackmer comments, "The human ear responds both to frequency and time relationships. Of the two — if you could say one is more important than the other — I think that time relationships are the most critical in determining what we hear and what qualities we assign to the sound. Every microphone sounds different, and even if you equalize them, they still won't sound the same. What I find is that the impulse response of the microphone and the quality you assign to it track each other very closely. Human hearing is capable of resolving time differences in the five to ten microsecond region, and so are our mics. You'll notice that the TC30K has a very simple shape and is not surrounded by any kind of cage because every cage has a complex acoustic signature. Since microseconds matter, every aspect of the shape is important. If we don't put the label on the mic, there is a 5/1000-inch groove and we can see an error near 1 kHz in the impulse response. It is very small, but it is there. We even had a customer say, 'Gee, the mic is a little funny around 1 kHz.' We told him to move the mic clip and the frequency response changed! So every detail - no matter how small - is important "

-Steve La Cerra

a pair of mics, the company will match them and supply a beautiful solid cherry presentation case at no extra charge.

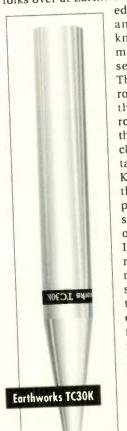
The first mics we received came with clips that did not put quite enough pressure on the body of the mic, so the mics would slip out of position when held at certain angles. Earthworks has changed to a design that holds the mic much more securely. There are no external controls of any kind; a standard three-pin XLR cable carries audio and phantom power between the mic and your console.

Earthworks suggests muting the signal from the TC30K for the first minute while the mic powers up and becomes stable, but we never heard any coughs or strange noises. Our first session with the TC30K involved recording a nylon-string acoustic guitar. The guitarist played quite softly, and, as a result, the TC30K's self-noise became quite evident even when the mic was placed within inches of the instrument. Tonally the mic sounded very closely reproduced what the instrument was actually producing, but the noise factor was a problem. Our experience was verified by literature from Earthworks that explains that the TC30K was not designed for ambient recording or recording very



quiet sources. Rather, the mic's strength is medium-to-high-SPL sources — so we decided to try miking live drums.

In our first drum session, we used a pair of TC30K's set up as an X-Y coincident pair. Omnis in X-Y configuration? I call this the Swedien technique because engineer-producer Bruce Swedien records omni/X-Y all the time with his Neumann M49's. The folks over at Earthworks also suggest-



ed this approach, and while we know it doesn't classic make sense, it works. The imaging was rock-solid, and, in particular room, bringing in the kick and snare close-mics was totally unnecessary. Keep in mind that the room sound plays a big part since the mics are omnidirectional. In a different room with the mics set up in a similar fashion, the drums sounded good but not nearly as good as in the first room. It just proves the point that using omnis makes the sound more dependent on the acoustical environment.

We then proceeded to move the mics closer to the drums (still in X-Y), first at a distance of two feet above the kick and then one foot above. When we got to the one-foot range, the tone of the toms ruled. They had the round bottom and midrange tone of close-miked toms without the high-end choke. And there was still a sense of space and room sound. In this position, the floor tom sounded a bit distant compared to the rack toms and the sense of spaciousness definitely decreased from the more distant position.

The next logical thing to do was to close-mike drums with the TC30K's. Since the TC30K doesn't suffer from proximity effect, you can mic much closer — which somewhat counterbalances the omni pickup pattern (Earthworks recommends getting as close as you can). We miked an inch away from the



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----- RS

top head on rack and floor toms, and the TC30K's really excelled in this application. Transient response on floor tom was excellent — the snap from the stick was right in your face and the big bottom of the drum was maintained without sounding sloppy. These mics are indeed capable of capturing very low frequencies. Although we couldn't actually hear it, closing the studio door clearly moved the woofers on our control-room monitors at a very low frequency.

Since TC30K's can be placed so close to an instrument, using a single TC30K on acoustic guitar was interesting. It's hard to describe, but we were able to get the mic an inch away without overblowing the bass — even with the mic near the sound hole. It was almost as if we could mic any area of the instrument and get a well-balanced tone as long as we kept the mic close to the guitar. Perhaps this naturalness of tone sounded unusual to us because it is rare that we can mic so closely without proximity effect dominating the sound.

TC30K's can on occasion act a bit "quirky." We used the mic with our Demeter VTMP-2a mic pre and got a strange pulsing click that almost sounded like a heartbeat, rendering the combination unusable. [Earthworks and Demeter have delved into this problem and come up with the solution. -HGL] Earthworks informed us that the TC30K also does not make a particularly good marriage with the Anthony DeMaria Labs mic preamp. David Blackmer explained to us that the feedback loop in the Demeter audio circuit operates at a frequency very near the critical frequency of the TC30K's electronics making the couple unhappy (he suspects that the situation is similar for the ADL preamp). In any case, we didn't have any problems with Mackie, ART, or Soundtracs mic preamps, but be aware that these mics may not be happy with every mic preamp.

Note that the TC30K's current drain is about 10 milliamps — rather high for a condenser microphone — so make sure your phantom power can supply 10 milliamps. If you are willing to throw some "classic" mic conventions out the window and try new ideas in miking techniques, the TC30K's will reward you with a very wide frequency range and time-coherent response.

-Steve La Cerra

PRICE: \$500 MANUFACTURER: Earthworks Inc., PO Box 517, Wilton, NH 03086. Tel: 603-654-MICS (6427). Circle EQ free lit. #122.

INNERTUBE AUDIO U87 TUBE RETROFIT

The Neumann U87 is a fine microphone. In the presence of some wonderful examples of vintage microphone art like an M49, C12, or 251, however, it would not be my first choice for a lot of things — vocals, for example; nor would its tube predecessor, the U67. So you can imagine my surprise while setting up for a recent tracking session when Richard Barron, the studio manager at Sonora Recorders, pulled out what looked to be a stock U87 and said, "You should try this. It has a tube in it." "So what?," I

the impression that the mic automatically becomes a '67, but nothing could be further from the truth, though the capsules are identical. "The U67," says InnerTUBE Audio's Stayne McLane, "is a totally different beast in that it uses an EF86, a very high gain pentode tube. It doesn't sound as good as a triode, but it has a lot of gain, which is why they used it. The tube I use is a 6072 dual triode like that used in the C12 and 251, which [in my opinion] is much better sounding."

Although I didn't get a chance to match the InnerTUBE retrofit against a vintage U67, I did get a chance to use it against both a stock transistor '87 and a few other vintage tube mics. I used the



thought, "'67, '87, it's not gonna have 'the sound' I'm looking for." But, ever the experimenter and trusting the taste of Richard (who has quite a nice vintage mic selection), I figured it was worth a try.

My original feelings have now changed since using what turned out to be the new InnerTUBE Audio tube retrofit for the Neumann U87. This retrofit utilizes the capsule and housing assembly of the standard '87 and includes a replacement internal tube preamp, an external power supply complete with pattern control, and all interconnecting cables. What's more, the retrofit is just about as instant as you can get, taking less than a minute to screw the exterior housing off, remove the solid-state preamp from the capsule assembly, and insert the new tube preamp. Plus, it has the distinct advantage of allowing you to return your '87 to "stock" if and when you ever want to.

It's hard not to throw superlatives around when you use an '87 with the InnerTUBE retrofit. I found it to be much, much "bigger" sonically than a stock 87, with a lot more bottom and much more open on the top.

Putting a tube into the '87 may give

InnerTUBE retrofit on all the things that I might normally use a good '67 on — sax, percussion, acoustic guitar, distant guitar amplifier, and even vocals. In every case, this mic blew away the standard '87 with no trouble at all. It was so much more open that it was like a blanket was lifted from in front of the mic every time we switched. And the difference was dramatic enough that not only the trained ears in the control room heard the difference; everybody heard it immediately.

When we put the InnerTUBE retrofit up against an M49 on a male vocal
(which, perhaps, is like comparing apples to oranges), the difference was
much less dramatic. Both sounded
great and you'd have to call it a taste
judgment at that point. Still, the InnerTUBE retrofit held its own with no
trouble at all vs. a very highly regarded
(and expensive) vintage cousin — something that neither a stock '87 nor '67
would be able to do.

The InnerTUBE retrofit is a real find. It is currently in use at A&M, Bearsville, and Westlake studios, and famed engineer Shelly Yakus has bought six. Yes, at \$1795 it does turn your U87 into one pricey item, but at least you



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know what you're getting in terms of a new piece of equipment likely to give you years of trouble-free service, as compared to the sometimes finicky ways of something 30 years old. Plus, it has "the sound" and it's got it in spades. InnerTUBE will soon come out with its "Four-Fifty-Tube" retrofit for the AKG 451/452 series — a development that I eagerly await. —Bobby Owsinski

PRICE: \$1795

MANUFACTURER: InnerTUBE Audio, 115 West Gutierrez, Santa Barbara, CA 93101. Tel: 805-963-3941. Web: http://www.gr8music.com/innertubeaudio.html. Circle EQ free lit #123.

PEAVEY PVM T9000

While their presence in the musical instrument market is undeniable (how many Mark III bass amps are out there?), it is more recent that Peavey has started to manufacture gear with the recording studio in mind. Its PVM T9000 microphone is clearly aimed at this market. With a list price of \$1399, Peavey's lat-

est professional studio mic falls into competition with mics such as the Neumann TLM 193 and the Microtech M71. The T9000 is a rather unusual entry for Peavey since it is a condenser design with a vacuum tube preamp.

You might be surprised at how light the PVM T9000 is when you first pick it up. Its body is made from stainless steel (which also contributes to the T9000's good looks). Unlike most condenser mics in

this price range, the T9000 is shipped already installed into its shock mount and is intended to be stored with the die-cast suspension — which also serves as a heat sink — attached to the microphone body. To change the tube (a 12AX7) you must remove the clamping collar at the base of the mic. This then allows the mic body (with the suspension still attached) to be removed from around the capsule, giving you access to the tube.

One thing that I appreciated about the shock mount was the large, knurled

knob at the pivot: very easy to loosen and tighten. Peavey has made the shock mount from several pieces, so if you have the misfortune of stripping the mic stand threads, you won't have to replace the entire mount. Controls on the PVM T9000 are rather simple: a 10-dB Pad switch and a Low-Cut switch. The pickup pattern is cardioid.

Peavey provides a power supply for the PVM T9000 that connects to the mic with a six-pin XLR connector. Whether or not the six pins are actually necessary, Peavey has made a smart move to prevent users from connecting the power supply to a console mic input. A standard three-pin XLR connector provides output signal to your console, and the only control on Peavey's black box is the On/Off switch. Peavey obviously intends for studios to leave this mic on a stand, ready for action at all times - the mic comes in a reusable shipping carton with plenty of foam padding; you don't get a fancy presentation case. [Peavey will make a case available as an option in the very near future. -Ed.

I first used the PVM T9000 to mic an electric jazz guitar solo. I placed the mic about eight inches away from one of the

amplifier's two 12inch speakers, about 30 degrees off-axis and pointing slightly downward towards the floor. In this application, the T9000 produced a big, fat, round and warm sound, and reproduced all of the wood that guitarist Pete Saccoccio was coaxing out of his Gibson Les Paul. At this distance the T9000 did not exhibit much of a proximity effect.

I then used the T9000 extensively for recording lead

vocals, in particular for vocalist Kai Lee's tracks on the upcoming Reason CD, Heads Or Tails. I would describe the tone of the T9000 to be lean and more flat (accurate) than most tube mics. It didn't have the bloated lower midrange that many mics can have.

This mic does not go belly up when a vocalist sings close and hard into it. Plus, it didn't squeeze the lead vocal like you might expect a tube mic to do in terms of compressing the sound. Even when Kai hit the mic

hard, the PVM still stayed open-sounding and didn't wimp out in the top end. There was a noticeable proximity effect when he got in close, but I expect that with a cardioid mic. The pattern of the T9000 is pretty tight, so I suggest moving the mic around until you find the sweet spot. This will be unmistakable when you find it and a change of only an inch or two can make a world of difference — the top end will open up considerably.

We also tried the T9000 on a baritone sax (through a Mackie 32•8 console, with the signal routed through a dbx 160X for compression). We placed the mic about eight to ten inches away from the sax, very slightly to the side of the horn. Here's where we really noticed the tight pickup pattern in the high frequencies — which proved to be an advantage. When the sax player placed a music stand behind the mic, the tone of the mic really didn't change much. Board EQ from Mackie was used to round out the bottom a bit: +1 dB @ 80 Hz and +1 dB @ 250 Hz.

The growl of the horn came through with a good amount of "blap" and the sound of the reed was clear. With the mic facing the side of the horn, sax keypad noise was quite evident. When we moved the mic to the bell opening, the keypad noise decreased and the sound brightened. Some of the lowest bass frequencies were exaggerated and getting closer than the 8-10 inches overemphasized the bottom register. When we listened to the horn in the mix, it didn't get mushy and still possessed a good quality of bite.

While doing this audition, I was under the impression that the T9000's list price was around \$2500. I was quite surprised to later learn that it's actually only \$1399. At \$2500, I thought that the T9000 was a well-built, sonically transparent microphone. At \$1399 it's also an undeniably good deal. The T9000 is one of those mics that sounds good on just about any instrument you might need to record, including voice and acoustic guitar. That quality makes it a strong choice for studios that don't have the budget for a zillion different microphones. In addition to good sonics, it also offers quiet output, solid construction, and fine looks - elements that combine to make the PVM T9000 a serious contender.

-Steve La Cerra

PRICE: \$1399 MANUFACTURER: Peavey Electronics Corp., 711 A Street, Meridian, MS 39301. Tel: 601-483-5365. Circle EQ free lit. #124.



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SOUNDELUX U95

Although brand new tube microphones are not quite as rare as they once were, a tube mic not based on a favorite vintage design is a rare breed indeed. Such is the case with the Soundelux U95, a mic, interestingly, designed and built not by a microphone manufacturer, but by a postproduction house.

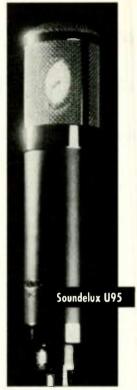
Soundelux, the Los Angeles-based audio post house responsible for block-buster films such as *JFK* and *Cliffhanger*, among others, actually brought in designer David Bock to build a better microphone for their own audio uses.

What he created is a tube mic for the rest of us.

Why start from scratch when there are lots of great units to copy? "We're just trying to take tube technology to the next logical level," says Bock. "I wanted to have a flat [response] tube mic for a change. One that would be powerful on its own regardless of which mic preamp you connect it to. Old tube mics can sound dramatically different when connected to a variety of mic preamps because the mic is being loaded down by the preamp. I wanted to get away from that and have the mic sound the same no matter where it went." Was this mic patterned on the sound of a vintage fa-

vorite? Bock emphatically replies, "This mic is not trying to emulate any other microphone, but I did want it to be familiar, just like the older microphones."

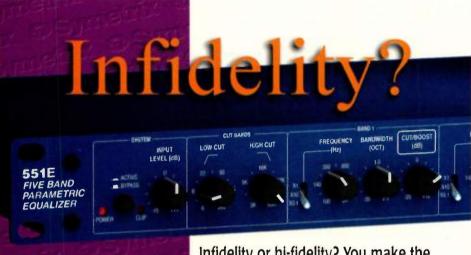
And familiar it is. Although it may not be designed to sound like one, the U95 does look very much like a Neumann U47. (The U95 is 2-1/16" x 9"; weight is 1.96 lbs.) This is a large diaphragm (1inch) condenser microphone with electronics centered around a low-noise 6072A tube, which is the



same tube used in the venerable AKG C12's. Although plenty of these tubes still exist as New Old Stock (NOS), it's possible to substitute a selected 12AT7 in a pinch, which means that this microphone will always be working as long as there's a Fender guitar amp around.

Just like its vintage brethren, the U95 has a remote pattern control located on the power supply that selects omni, cardioid, figure-eight, and six intermediate steps. Soundelux states that it has a low equivalent noise of 18 dB (A rated) and a maximum SPL of 135 dB (0.5% THD). The frequency response is stated to be 20 Hz to 20 kHz, but the response chart supplied with the microphone showed the mic to be remarkably flat (as in like a ruler) up to about 10 kHz in cardioid, with about a 2.5 dB bump that peaked at 13 K. Omni showed a 2.5 dB dip at 5 K along with the same 13 K neak.

Before I tried out his mic, I asked Bock what sound sources it worked best on. "The particular application it was designed for was male vocals," he said. But he also cautioned, "You want your mic to work on everything, but no one has yet designed that as far as I'm concerned." So off I went to use this mic on a variety of instruments and voices during several recent projects. As Bock stated, the mic really shines on male vocals. I put it up side by side with a pretty good C12 using the preamps of a nice vintage Neve 8078, and while it was like comparing apples to oranges (very ripe, juicy apples and oranges), the 13 K



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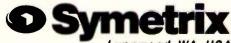
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- Zenon Shoepe. EQ Magazine

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On another date I used it on the tenor sax of blues great Joe Houston through the on-board mic amps of an API 3208. When compared to a stock U87, the U95 had much more body and fullness and more air on the top. As a result, the sax (which can be difficult to record accurately because the sound emanates from multiple source points) was captured in all its glory and realism. Another time I used it as an ambience mic on a guitar amp, placing it about 3 feet way from the speakers of a wonderful '59 Fender Bassman. Once again, the body and fullness, as well as the clarity, were impressive. About the only thing the U95 didn't like was when it was placed about 3 feet above a set of congas. The sound would "collapse" every time the low conga was struck. But as Bock said, even though you want a mic that works well on everything, that mic hasn't yet been made.

The Soundelux U95 is a versatile mic that transcends the vintage market. Anyone who has attempted to buy a vintage microphone knows that you have to go through quite a few until you find one in reasonable shape and working order. The Soundelux U95 eliminates the searching and demo'ing and, at a retail price of \$2995, saves you half the cost as well. It doesn't sound exactly like an old tube favorite, but it's not meant to either. It does, in fact, sound better than a lot of the run-of-the-mill vintage mics—and that's good enough for me.—Bobby Owsinski

PRICE: \$2995. Includes shock-mount, lacquered case, power supply and cable.

MANUFACTURER: Soundelux, Inc., 7060 Hollywood Blvd., Suite 711, Hollywood, CA. Tel. 213-463-3855. Distributed by Group One, Ltd., 80 Sea Lane, Farmingdale, NY 11735. Tel. 516-249-1399. West Coast office: 213-656-2521. Circle EQ free lit. #125.

SHURE BETA SERIES

Shure's new Beta Series of microphones combines some brand new ideas with a nod or two in the direction of their extensive microphone history. Although the Beta 58A, Beta 57A, and Beta 87 are updated versions of mics that are probably familiar to you, the Beta models 52 and 56 are new designs. All five microphones have a distinctive blue rubber ring surrounding the windscreen, de-

signed to lessen the impact of a hit to the side of the mic. *EQ* had the chance to take these mics on a road trip with Blue Öyster Cult that included venues varying from small clubs to a 25,000-seat outdoor festival. Consoles included Yamaha PM3000 and PM4000, Ramsa WR-S840, and TAC Scorpion.

Of all the new Betas, the one that intrigued me the most was the Beta 52. This large-diaphragm dynamic microphone has a frequency response tailored by Shure specifically for instruments with a lot of low-frequency content such as kick drum and bass. The Beta 52 is de-

Shure Beta Series

signed to handle high SPLs; the frequency response has a 5 dB dip at about 250 Hz and a midrange peak of 10 dB at around 4 kHz. Shure's frequency response chart for the Beta 52 shows that low-frequency response can increase as much as 18 dB at 50 Hz when the mic is 1/8 of an inch from the source.

The Beta 52 is a solidly built mic. Weighing in at almost a pound and a half, the Beta 52 requires a solid stand (and can also be used for self-defense...). Shure's engineers have designed the 52 with a built-in, adjustable Dynamic Locking stand adapter that allows the head of the mic to pivot through almost 180 degrees. My first impression was that there was no way this mic would stay put once the pivot was tightened, so the tendency is to want to crank the screw as tightly as possible. This is not recommended by Shure, and a gentle turn really is all that's necessary. Much to my surprise it didn't move the slightest, despite the fact that the band was rocking and so was the drum riser.

Getting the entire mic inside the kick drum requires a rather large hole in (or removal of) the front head. We

started with the front half of the mic just barely inside the front head. In this position, the mic didn't sound very good. There was too much midrange for my ears and the low frequencies were anemic. Next, I placed the mic inside the drum, about six inches from the head, directly in front of the beater. Low end became much more pronounced and top-end "snap" came alive. The 52 had no trouble handling the SPL, and the harder the drum was hit, the better the Big Beta sounded. Moving the mic away from the batter head (so that it was barely contained within the drum shell) gave

a little bit more bottom, but lost some of the aggressiveness of tone. I'd say that the Beta 52 is very sensitive to placement.

The Beta 56 was probably my favorite of the group. I tried it on snare drum for the first show, and it stayed there. Positioning the 56 was a breeze and reminded me of using an

SM56 to get into tight spaces. I have had a particularly tough time getting snare mics into position on Blue Öyster Cult's drummer John O'Reilly's drum kit because he likes to place his toms tight and close to the snare. As a result, the only approach for a snare mic is from the hihat side, coming across the stage-left bass drum with a low boom stand. Since the Beta 56's XLR connector can be at a right angle to the capsule, it makes squeezing into tight places very easy and at the same time gets the cable and connector out of the way (both the Beta 56 and the Beta 52 require care when attaching them to mic stands you don't want to strip the threads on the stand adapter). If you hadn't already guessed, I really like this mic on snare. It required little or no EQ, took plenty of pounding and, like the Beta 52, stayed in place once I had positioned it. Rejection of the toms was pretty strong and, like the Beta 52, only a gentle tightening of the adjustment screw was necessary to keep the position steady.

I noticed that with the 52 and 56 you have to be aware of the knurled plastic screws used on most boom mic

stands for telescopic adjustment: it is possible for the XLR connector to get in the way of the screw. This never became a problem, but does requires a bit of thought on how far to extend the boom and how it should be rotated.

Since the Beta 57A uses the same element as the 56 (Shure's R174), it gives pretty similar sonic results. I used the Beta 57A for tom, snare bottom, and vocal. On snare bottom, the '57A provides plenty of that papery slap that can be heard from that side of the drum. On rack tom it had plenty of attack but emphasized the lower midrange. On Blue Öyster Cult bassist Danny Miranda's vocal, the Beta 57A did a great job of feedback rejection, provided a hot signal, and didn't collapse under mondo compression.

Shure's Beta 58A is probably more familiar to many engineers - I like to think of this Beta as an SM58 on steroids. In addition to a hotter output and a more aggressive high-mid frequency response, the Beta 58A also has a super-cardioid pickup pattern (as opposed to the SM58's cardioid). With that in mind, Shure includes a clever monitor-position template that fits over the mic and points to where the monitors should live when you use the Beta 58A on stage. We used the Beta 58A on Danny's vocal: he was happy with the sound of the mic in the monitors and I was happy with the sound in the house. It pushed through the mix but it didn't sound harsh (an occasional twist of the LF rolloff knob was needed). Intelligibility was high and overall tone was well-balanced. It also did a good job of rejecting the loud backline of amps and drums.

We didn't get to play with the Beta 87 as much as the other mics, but we did try it on a few things. On percussion, transient response was excellent. I really liked the '87 on snare as an alternative to the Beta 56, but unfortunately it was too large to keep out of that "dangerous drumstick highway" on John's kit. All of these new Betas come with protective vinyl cases; mic stand adapters are included for the 57A, 58A, and 87. Overall, Shure has come up with a solid new family of rugged mics that will be right at home on stages in clubs, theaters, and arenas. -Steve La Cerra

PRICE: Beta 52, \$310; Beta 57A, \$220; Beta 87, \$434.00; Beta 58A, \$266; Beta 56, \$240.

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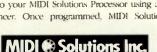
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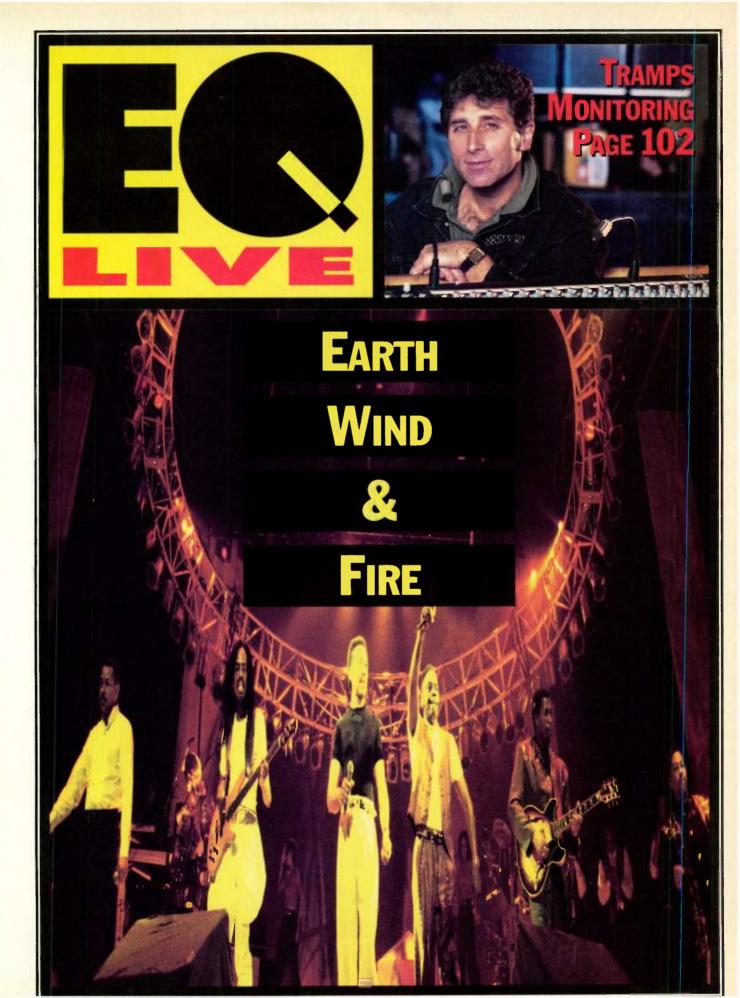


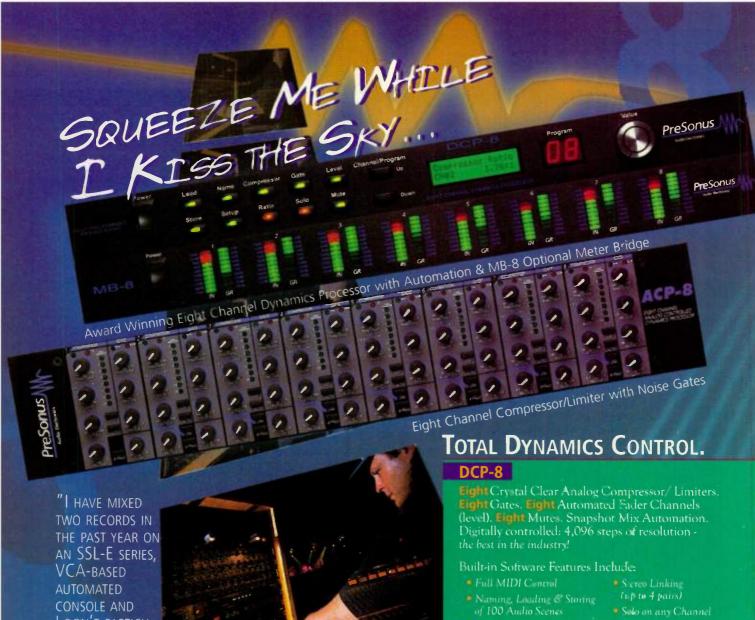
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EARTH, WIND AND FIRE ON THE ROAD

No, NOT A SERIES OF NATURAL DISASTERS, BUT A BEHIND THE SCENES LOOK AT THE BAND'S NEW GREATEST HITS LIVE ALBUM BY STEVE LA CERRA

> "WE HAD JUST signed with a Japanese label and decided that the timing was right. We actually haven't done a live record in some years -I think the last one was in '75 or '76 - and now we were ready." So begins Maurice White in describing the genesis of Earth, Wind and Fire's newest CD, Greatest Hits Live. "We have a great band and wanted to showcase how far they could stretch out." And indeed Maurice (who handles lead vocals, kalimba, and percussion) has assembled quite the gathering of players: Philip Bailey on lead vocals and percussion, Verdine White on bass, Sonny Emory on drums, Sheldon Reynolds on lead vocals and guitar, Ralph Johnson on percussion and vocals, Michael McKnight on key-

boards. David Romero on percussion, Ray Brown on trumpet, Scott Mayo on sax, Reggie Young on trombone, and Carl Carlwell on vocals and percussion. Morris Pleasure plays keyboards and also acts as musical director for the group.

> Greatest Hits

Live was recorded during two nights in Tokyo, Japan at a club called Velfarre. While the recording was handled by engineer Robert M. Biles, Maurice had the daunting task of producing the project while actually playing as a band member. "As a producer, the most important thing to me is the sound of the record. I was concerned about mics; making sure that mics were 'on' and that they were not getting dislodged or unplugged. I was afraid that somebody would hit a mic or something would come unplugged without us knowing it. I had the double whammy!" But outside of a guitar mic going down for a few moments, there weren't any real problems.

Maurice continues, "I

had just finished doing a project with Bob and I had worked with him quite a bit in the past, so I wasn't worried. We discussed it thoroughly and he knew what I wanted. There were a couple of times when I had breaks, like where there might have been a drum solo or a sax solo, and I would run from the stage out to the truck and back! But we didn't EWF's normal crew of more than a dozen stage techs was the Velfarre's adds, "was very thorough and in tune with what we were doing."





Engineer Biles notes that one of the challenges of doing this project was not being able to speak Japanese. "I had some time to deal with preproduction," he states, "so I found an interpreter and told them exactly what I wanted to do. The crew was very, very good and basically let me do my thing."

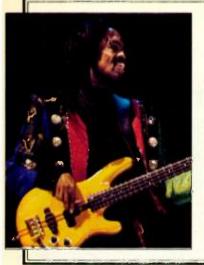
Robert recorded the show from inside the Multi Recording Mobile (No. 3) truck that was stationed outside of the Velfarre. Biles explains that he "basically just got a split from MSI Japan (EWF's sound





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HE'S GOT THE RHYTHM: Verdine White on bass.

company for this tour) and it went to the remote truck. Inside the truck I had a 48-input Neve VR console, a 14-input Studer console, and little rack of Neve mic pres with compressors and gates. From there, the signals went straight over to a Sony 48-track digital ma-

chine. I chose to use the Sony 48 because I didn't know the show well enough to fit it onto 24 tracks, and it would have been a leakage nightmare. Plus the tapes ran longer on the 48—about an hour and ten minutes. We had two 48's and we staggered somewhere in the middle of a song. Ultimately we ended up with one song where the

first 10 minutes were on one reel and the rest of the song was on another reel. I just crossfaded somewhere in the middle."

Biles had 56 inputs coming from the stage due to the nature of EWF's musical lineup. In addition the usual bass, drums, guitar and (six) vocals, there were two keyboard rigs, three percussion kits, and three horns - not to mention a DAT for the show intro, one stereo feed for some sequenced percussion, and another stereo feed for additional sequenced keyboards. For vocals, Biles comments, "I did what I would have done in the studio - I pretty much just used compression." (Most of the vocals came through Shure UHF wireless units with SM58 capsules.)

When possible, Biles would take the shortest path to the multitrack: "Wherever I could, I would patch from the insert out right to tape and avoid busses, faders, and all that stuff. The way I work is that I like to keep the signal path as short as possible. You might not think that it makes a difference, but when you have 48 signals going to tape, it really does make a difference because it's cumulative." The engineer notes that there was some leakage from stage mics, but not more than was expected. He adds, "You have to realize that it is a live show and it's going to happen. There was also a little bit of feedback here and there, but there's nothing that you can do about that either, especially when you're in the truck because you don't have control over it anyway."

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ments would have to be grouped such as the toms. Although each tom received its own mic (Shure SM98A's for the racks and Sennheiser MD421's for the floor toms), the lot of them were subgrouped to two tracks. Each one of the percussion sets ended up as a stereo pair plus two mono tracks, and while congas and timbales were all miked individually, those instruments were also subgrouped to their respective mono tracks.

Robert notes that he was able to control leakage by this type of grouping especially since the percussion was only played at certain times. "If I was recording to a 24-track machine, I would have had to print all of the percussion to one stereo pair and there would have been leakage everywhere. If I was more familiar with the show. I could have actually muted the individual mics during the recording and reduced leakage that way." Congas were miked with Shure SM98A's (for Philip Bailey) and Sennheiser MD421's (for David Romero), while AKG C460's, C414's, and more Shure SM98A's were used for myriad percussion toys. Genelec 1019A's were used for monitoring.

POST SHOW WRAP-UP

Robert recorded the entire show for both nights, and then it was time for Maurice to take the tapes back to Sunset Sound for a bit of postproduction. Unlike a lot of "live" albums, EWF's intention was not to cut some live tracks and then do a lot of overdubs in the studio. So White edited the tapes, taking the best performance of a given song from either night and then using that entire "take" of a song for the CD.

continued on page 126



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A RETURN TO TRAMPS

MONTHS AFTER
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GETS A LONG
OVERDUE SPEAKER
UPGRADE
BY BAKER LEE

In the October 1995 issue of EQ, Baker Lee wrote about an upgrade to the PA system at Tramps in New York City. At that time the club installed a 40-input Crest Century GTx console. With the new console in place, the club was ready for an upgrade of the PA mains, which was recently completed. Baker Lee, house engineer for the club, discusses the details here.

Tramps had been in need of a speaker upgrade for a while. The boxes that were in place were just not adequate to fill the room when it was packed — which was more often than not. They were a Jack Weissberg prototype (a good box about the same size as a Meyer Sound UPA) with a 1-inch TAD driver and a front-loaded, 10-inch JBL driver that was loaded pointing down. There

were six of these boxes flown three per side. For the low end, there were four EV-style double 18-inch boxes (two per side) that had been built for us by Tom Long.

These boxes all sounded fine, but they were just not moving enough air. Subsequently there were quite a few dead spots in the room, and, even with a different focusing of the boxes, I couldn't get the proper coverage I needed. It was also apparent that Tramps needed an upgrade to a 2-inch driver; this was especially noticeable when alternative bands would play the club, because the smaller boxes could not properly disperse the mix of guitars and drums and still be able to provide a clear and strong vocal on top.

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We flew the LS3 boxes three on each side of the room and placed two LS2's per side. Power to the cabinets is supplied by Crest amplifiers. All of the 2-inch drivers in the LS3's (three per side) are powered by a single Crest 4001 amplifi-



HOUSE SPEAKERS: Baker Lee shows off Tramps' new Production Services Lab Series LS3 speakers.

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er, while one Crest 7001 powers all of the 10-inch drivers (also three per side). A second 7001 powers six 15-inch speakers per side (12 total). Subs are powered by a Crest 8001 amp on two of the boxes and a Crest CA9 on the other two. I use an Aphex Dominator across the entire system for protection and house equalization is handled through a BSS stereo graphic equalizer.

The difference in sound dispersion was and still is a great improvement — the room no longer has dead spots and I can cleanly mix loud guitar, the crack of a snare, a bright piano and horns, and still have plenty of headroom for a clean, clear vocal sound.

CROSSOVER CORNER

A Yamaha 2040 is used to run the system in a four-way mode. Crossover between the subs and the 15-inch speakers is at 100 Hz. Then the 15's cross over to the 10's at 400 Hz and the 2-inch horns come in at 2 kHz. A high-pass filter rolls off response below about 28 Hz and a low-pass filter rolls of the top end at around 16 kHz. The nice thing about using the Yamaha 2040 as a crossover is that each section of the processor (low, low-

mid, high-mid and high) has a 2-band parametric equalizer that enables me to make most of system response without touching my graphics.

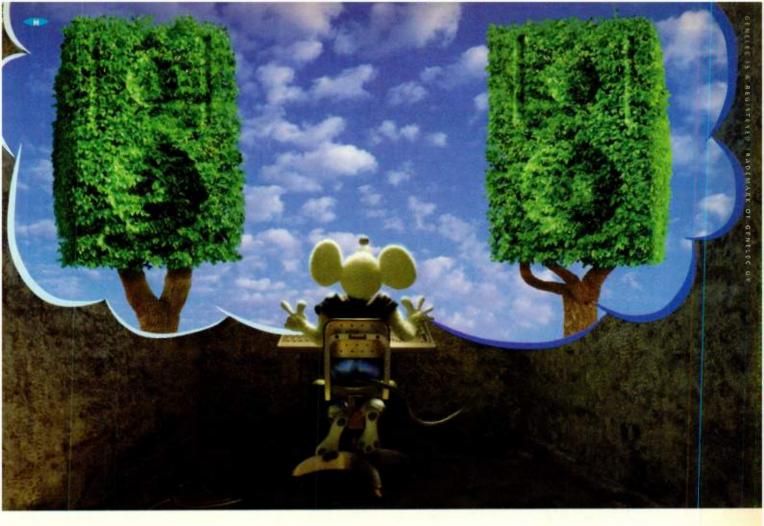
These boxes are honky at the crossover points, so I ended up dumping a great deal of 350 Hz and 400 Hz in the crossover. I also had to lose a lot of 1.5, 2.5, and 6.3 kHz, but the boxes now have a particularly smooth and flat response. Our graphics can now be used to equalize individual shows instead of the speakers themselves. At this point I've mixed quite a few shows without the graphics and have had great success. I have the clarity and dispersion for more subtle acts, but I can also get the SPL I need for the louder shows.

I keep the crossover and the Dominator at the FOH position, which enables me to have easy access to the system. For example, one night I had a funk band and a jazz band on the same show. The funk band needed a good, solid bass response, but that kind of bottom end only got in the way and muddied the sound of the jazz band. So for the funk band I left the system as is, but for the jazz band I stored the band engineer's EQ and now I have a jazz band EQ set up for the system.

The only problem we did have was that the new boxes are a good deal larger than the old ones, and because of the low ceiling at Tramps, the stage-right cluster obscured a good part of the sight line. So we moved the boxes about 15 feet out to the side of stage right and left, and because this is such a wide room, spreading out the speakers actually made the coverage better than ever. The subs weren't moved and are still at either end of the stage, but since low end is relatively nondirectional, it has not made any difference in the bass response.

Baker Lee is house engineer at Tramps in New York City.





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tering. The cabinet is a fullrange, 2-way passive loudspeaker featuring a 60-x 150-degree rotatable Com-

plex Conic horn a 1-inch extended range titanium HF driver. and a 6.5-inch woofer. Continuous power handling is 200 W@ 8 ohms with 92 dB 1W/1M sensitivity. For more information. contact Renkus-

Heinz, Inc., 17191 Armstrong Avenue, Irvine, CA 92714. Tel: 714-250-0166. Circle EO free lit. #129.



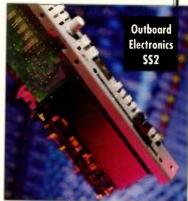
My OH MEYER

The PSM-2 from Meyer Sound is a self-powered loudspeaker designed for stage monitoring applications. With a coverage of 60 degrees in both the horizontal and vertical planes (-6 dB points), the PSM-2 is a constant-Q system and the amplifier and controller electronics are fully contained within the compact enclosure. The PSM-2's Intelligent AC system features automatic voltage selection, EMI filtering, soft current turn-on, and surge suppression. The drivers and their control electronics use True Power limiting, which uses the actual monitored power usage to determine when limiting is required. The PSM-2 also features a remote monitoring access port that allows the op-

> erators to monitor signal levels, limiter activity, amplifier heat sink temperature, and cooling fan status. For more details, contact Meyer Sound Laboratories, Inc., 2832 San Pablo Avenue. Berkeley, CA 94702. Tel: 510-486-1165. Circle EO free lit. #130.

AUTOMATIC FOR THE PEOPLE

Primarily intended for use in live applications where complex audio events require several settings of levels, routing, and console set-up to be stored and recalled, Outboard Electronics SS2 retrofit fader and switch automation system is a snapshot system that possesses dynamic capabilities. Each stored scene may consist of either static fader levels with a programmable crossfade rate and switch status. or dynamic fader and switch events in real time. Up to 128



faders as well as 128 mutes and one or several matrices up to a total size of 16 blocks of 8 inputs and 8 outputs, can be controlled by the SS2. For details, contact Outboard Electronics, Unit D Copley Hill Farm, Cambridge Road, Babraham, Cambridge CB2 4AF, UK. Tel: 44-0-1223-837827. Circle EO free lit. #131.

MAXIN' OUT

Electro-Voice has recently refined and expanded its DeltaMax loudspeaker systems. The DMS DeltaMax line features new drivers, woofers and horns, new cabinet configurations, new hardware, new rotatable horns in two models, and upgraded electronic controllers. Comprised of the DMS-1122/85 12inch and DMS-1152/64 15-inch two-way loudspeakers; a DMS-2181 dual 18inch subwoofer; and two new additions, the DMS-1183/64 18-inch three-way loudspeaker and the DMS-1181 single 18-inch subwoofer, Delta-Max users now have a greater flexibility in configuring systems. For more details on the extended DeltaMax system, contact Electro-Voice, 600 Cecil Street, Buchanan, MI 49107. Tel: 616-695-6831. Circle EQ free lit. #128.

How do you change your thinking about recording?

Just UNDO it.

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

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

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



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

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

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

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

Roland VS-880 Digital Studio Workstation

Roland Corporation U.S., 7200 Dominion Circle. Los Angeles CA 90040 (213) 685-5141 Rut d Conat Min. Ltd. 5400 Part and We, Rutmond B.C. Vov 2M4 (604) 270-6826 Fax-Back Information (213) 685-5141 ext 271 COMPUSERVE GO ROLAND

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

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



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



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



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



D TRACK

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

The locators and 1800 markers take full advantage of the VS-880's random-access capabilities. Just choose a point and you're instantly there. Every aspect of the creative process is faster and easier.





JBL-SMAART MEASUREMENT SYSTEM

THERE COMES a time when you need to know more about your equipment than simply what you can hear. If you must precisely equalize a loudspeaker system, then doing it "by ear" is not enough. To maximize the gainbefore-feedback or optimize the frequency response you must quantify specific qualities of sound using an accurate measurement system. Most of us have seen or used a Real Time Analyzer (RTA), but as more people are realizing, there are areas where an RTA will ignore, or gloss over, important and audible sound qualities. Until the introduction of the

new JBL-Smaart measurement system, it was expensive and/or complex to gain further insight into the audio signal.

What is the frequency response of your studio monitors, sound reinforcement system, or favorite microphone? Without using a time-domain analyzer you cannot tell the difference between the room acoustics and your device (see sidebar: "Frequent Time Analysis"). However, when using a time-domain analyzer. you can measure the device as though you were in an semi-anechoic chamber and disregarding much of the venue's acoustical behavior.

Two audio consultants,
Sam Berkow and Alexander
("The Deuce") Yuill-Thornton II, have built their international reputations using
sophisticated acoustical
measurement systems.
Their frustration with the

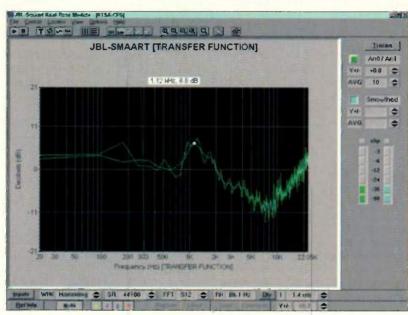


FIGURE 1: The frequency response of a system can be displayed using the Transfer Function Mode of the Realtime Module while music or any full-range audio source is used as a test source. The display can be smoothed (blue line) and show the raw response (green line) with the current frequency resolution (FR 86.1 Hz) shown at the bottom of the display. All the primary measurement parameters can be adjusted onscreen while viewing the resulting measurements.

existing tools drove them to design a system that was easy to use and offers useful information in very short order. The resulting JBL-Smaart software is distributed by JBL Professional and enables anyone with a Windows-compatible sound card in a PC to make FFT-based measurements of sound systems, control room monitors, room acoustics, or audio equipment.

The software operates as two modules, Realtime and Analysis. The Realtime Module allows the user to make frequency response measurements of equipment or acoustical systems even while they are in use. The module provides a Transfer Function mode that compares the output from a mixing console with the output of a measurement microphone (see fig. 1). Once the two signals are

matched in level and offset to arrive at the same time (more on that in a moment), the resulting FFT response is the change in frequency response through the signal chain. Simply put, the music playing through the sound system provides the necessary energy (test signal) to measure the frequency response of the sound system. This is not the first system to offer this facility, but IBL-Smaart is an order of magnitude less expensive than its predecessors. It also happens to be very easy to get up and running.

Music, however, does not always provide sufficient energy at all frequencies to achieve a smooth looking frequency response curve. A coherence function in the Transfer Function mode allows the user to see gaps in the available data (insuf-

ficient audio energy, noise contamination at the measurement microphone, or non-minimum phase changes in response) where the response curve is not completely reliable and cor-

ROAD

MANUFACTURER: JBL Professional, 8500 Balboa Boulevard, Northridge, CA 91329 Tel: 818-894-8850. Web. www.siasoft.com.

APPLICATIONS: Acoustical measurements in real time and accurate analysis of frequency and time behavior using WAV files.

SUMMARY: A comprehensive measurement system for quickly analyzing frequency response using music or other audio program as a source.

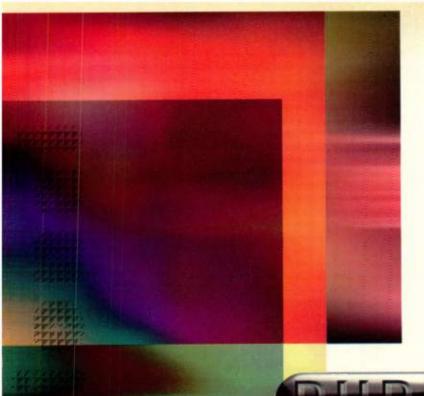
STRENGTHS: An extremely affordable and easy to use FFT analyzer

WEAKNESSES: Requires a good quality 16 bit stereo sound card in a Windows based PC; doesn't provide phase information

PRICE: \$695 for software. Hardware must be purchased separately.

EQ FREE LIT. #: 132

BY WADE MCGREGOR



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CD-R63

FREQUENT TIME ANALYSIS

Frequency is usually the primary qualifying factor in analyzing the performance of equipment. Other parameters, such as transient response or phase response, are either ignored or simply secondary to the frequency response of a device or entire system. As we learn more about the human auditory system (our hearing), however, we are discovering that the frequency domain is only important in specific circumstances and is secondary to other measurable criteria in quantifying equipment performance. Remember that, in audio, frequency and time are inextricably linked. Frequency (Hertz) is defined as cycles per second.

In order to assess the equipment, especially in an acoustic environment such as a theater or control room, we need to separate the frequency information that counts (and that we can control) from the rest of the signal. Once the sound has left the loudspeaker, the influences of the room acoustics cannot be adjusted electronically and must be changed by other means. To make this distinction, we must be able to choose a specific time (for instance, the transit time from loudspeaker to measurement mic) when a valid frequency measurement can be made.

When we equalize a sound system, we must remember that the only sound we can influence with equalization is the direct sound from the loudspeaker. Our measurement system needs to be able to distinguish this part of the audio signal if we are to

rective equalization should not be applied.

Real-time measurements can be seen in the familiar 1/3-octave display of the ubiquitous RTA, but this can hide many faults that are audible in audio systems. JBL-Smaart measurements can be viewed in very fine detail (down to less than 2 Hz resolution) as set in the program. However, like all time-do-

main measurement systems, the resolution cannot be optimized for the entire audio band and low-frequency resolution is best achieved by reducing the bandwidth of the measurement. The user can simply press buttons on the screen to move from one audio band to another when investigating an audio signal in detail. If low-frequency resolution is not paramount, the

make electronic adjustments (i.e., EQ) that produce a correspondingly audible effect. This is why time-domain measurement systems based on the Fast Fourier Transform (FFT), Time Delay Spectrometry (TDS), or Maximum Length Sequence (MLS) analysis have been commonly used by professionals involved in acoustical performance analysis for the past decade or more. An FFT analyzer captures the sound energy over a specific

An FFT analyzer captures the sound energy over a specific period of time as a digitized sample for analysis. The Fast Fourier Transform then converts the time-domain audio sample into the more familiar frequency domain. By sampling the sound in sync with the arrival at the measurement microphone, we can better isolate the sound that is electronically adjustable from (all but the nearfield reflection) effects of the room acoustics. The FFT analysis can also yield information on the room acoustics, such as early decay time and reverberation time, in addition to the impulse response of the loudspeaker/room combination.

The more you understand about the system you are measuring the more likely you are to make the right choices of what to measure and how to interpret the results. By making measurements, making adjustments, and listening to the results, you will begin to correlate the audible effects with the visual display of the measurement system. This is the process that is essential to using any measurement system for problem solving. Take the time to listen and learn. It will be worth it. —Wade McGregor

JBL-Smaart software can analyze the full audio spectrum (20 Hz to 20 kHz) on a single screen.

The current version of JBL-Smaart (v1.2) does not include the phase/frequency information that is very useful in determining the behavior of a loudspeaker system (promised in future versions). However, other important criteria, such as absolute polari-

ty, can be determined with the impulse response waveform of the Analysis Module (see fig. 2). Data windowing is used in FFT to minimize measurement artifacts and JBL-Smaart includes the full range of window types, including rectangular, Hamming, Hanning, Blackman, Blackman-Harris, Parzen, and Welch. Unfortunately, the user's manual does not go into any detail to explain the appropriate choice of data window, leaving users to experiment with this relatively obscure aspect of FFT-based measurement. Choosing the wrong window has the potential to corrupt the

measurement results for the unwary user.

You do not have to use the program on-site to make measurements, and this flexibility is a powerful feature of this measurement approach. For instance, you can analyze common characteristics of a room by recording an impulse (gun shot, balloon burst, etc.) or you can create an impulse by simply recording the output of the mixing console and measurement microphone setup to capture the sound system output from the audience area. The resulting recordings are input into the program (the former direct to the Analysis Module, the latter is first sent through the Realtime Module's Delay Finder Feature). The resulting data can display the frequency response, reverberation time, early-to-late energy distribution, and other acoustical parameters. If you don't need to know about rooms, you can put this processing to work in analyzing and documenting your favorite reverberation settings in your effects units.

The Delay Finder Feature is an automatic way of recording a WAV file that is used to convolve the FFT for

continued on page 126

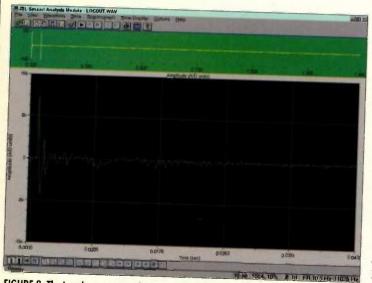


FIGURE 2: The impulse response of a system dearly displays the absolute polarity and other acoustical phenomena. The yellow line on the green background at the top of the screen represents the impulse response over the entire sound sample. The user can select any location on this time axis to analyze aspects of the frequency or time response in detail.

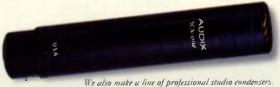


Miking your kit is as easy as D1, D2, D3.

Getting your kit to sound great takes effort – we believe that miking it shouldn't. That's why we've created the Audix D-Series. Designed for the serious percussionist, each microphone has unique sonic qualities. It's this uniqueness that insures you'll capture all the snap, sizzle, crash and bottom end your kit has to offer – miking with Audix is as easy as D1, D2, D3.

Unlike some mics that rely on neodymium magnets for high output, the **□-Series** uses VLM (Very Low Mass) technology. An Audix exclusive, VLM is created with a super strong, yet very thin and lightweight diaphragm. The lightness allows quicker response to acoustic impulses for unequalled levels of resolution as well as the ability to handle huge SPL's.

The D1 is ideally suited for snare and smaller high pitched toms. The noise rejecting hypercardioid polar pattern and naturally enhanced presence peak enables the D1 to compliment percussion and mallet instruments.



We also make a line of professional studio condensers.

With interchangeable capsules, different polar patterns, and extremely flat
frequency response – the SCX-1 is ideal for overheads and studio recording.

Because of added warmth to the low end, the 12 is perfect for use on low toms and kick drum. The hypercardioid pattern greatly reduces the chance of feedback during live performance while allowing the lower frequencies to punch through.

The ultra linear frequency response and greater dynamic range of the B3 make it the perfect choice for use in the studio where every nuance of the drums is critical. Extremely compact, the B3's uncolored sound can handle sharp transients without clipping.

All of the D-Series are built for the road as well as the studio. A rugged e-coat finish, durable gold XLR connector and precision tooling milled from a single piece of aluminum put the D-Series in a class of their own.

Don't buy a mic without trying an Audix.



For more information call, 1.800.966.8261 ext. 123
Web Address - http://www.audixusa.com

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NREVIEW

Spectral Translator



MANUFACTURER: Spectral (a Euphonix Company), 18800 142nd Ave NE, Woodinville, WA 98072. Tel: 206-487-2931. Web: www.spectralinc.com

APPLICATION: Digital audio format converter.

SUMMARY: Converts the following proprietary digital formats: Alesis, Sony, Spectral, TASCAM, and Yamaha.

STRENGTHS: Very easy-to-use, no manual required; the Translator Plus selects and routes signals like a digital patchbay.

WEAKNESSES: No AES channel selector.

PRICE: Translator, \$995; Translator Plus, \$1495 (w/AES)

EQ FREE LIT. #: 133

BY EDDIE CILETTI

SPECTRAL IS AN American workstation company (owned by Euphonix) whose interface experience comes naturally. Its two hardware packages — the Audio Engine (16 channels from \$3900–\$12,000) and the Prisma (8 channels from \$3400–\$6800) — are supported by Express, Producer and Studio Tracks software. The Translator and the Translator Plus (reviewed here) are two, single-rack-space products that were created to make your interconnecting life easier.

About a bazillion years ago I recorded a band in a barn in a little town called Bearsville, NY. Now that I have a workstation, a wacky idea to remix those particular old tunes has taken root. The scary part is that analog tapes of this vintage suffer from major shedding — the binder that secures the precious oxide to the plastic backing absorbs moisture and is deactivated. I baked the tapes in order to reactivate the binder long enough to transfer 24 very raw tracks to three DA-88's. The Problem: How to get 24 tracks into a digital workstation that only records two tracks at a time without leaving the digital domain.

The Solution: The Spectral Translator Plus (with a little help from Z-system's Digital Detangler).

On the surface, the Translator is a userfriendly 5x5 digital patchbay. (I misplaced the manual, but still managed to get the job done!) Two identical rows labeled Format A and Format B have five buttons each. which in turn are labeled: ODI (ADAT optical); SMDAI (Spectral); TDIF (TASCAM); Y2 (Yamaha); and standard AES. Each position has its own very bright LED to clearly indicate the selection. Three Master Clock options - Format A (the source); AES; and Internal - plus six LEDs indicate the selected clock, the Sample Rate (44.1 kHz or 48 kHz), and System Lock, all respectively. Choosing the same source and destination lights a Bypass LED, while the AES output can choose between Format A and Format B. There are two additional outputs: Word Clock and Super Clock.

Fig. 1 shows a block diagram of the Translator interfaced to a DA-88, a Z-Systems Digital Detangler, a pair of Soundscape SSHDR-1 workstations as well as an Alesis ADAT. The Source (Format A) is the DA-88. From a single DB-25 connector, TASCAM's proprietary Digital Interface (TDIF-1) has four, unbalanced stereo inputs and outputs. For the Destination (Format B), I chose the Sony PCM-800

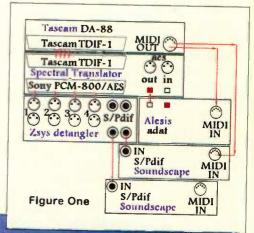
format, which is also on a DB-25. Inputs and output are on separate DB-25 connectors and the format is actually four standard AES signals.

Spectral supplied a pair of DB-25 to XLR harnesses, one of which linked the Translator to the Z-Systems z-8.8 Detangler. I chose this method because the AES ports of the Translator are hard-wired to channels 1 and 2. The z-8.8 has four AES inputs that were then independently routed to each Soundscape unit, allowing four channels to be transferred at once. MIDI timecode between the DA-88 and the SSH-DR-1 completed the picture.

I did a quick 8-channel transfer between a DA-88 and an ADAT. Again the transfer was painless. It made me think there might be a nice niche business in digital transfers....

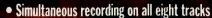
I love workstation mixing for its editing power and automation. Edison was right: "Genius is one-percent inspiration and ninety-nine percent perspiration." So much for the raw tracks. The Spectral Translator allowed me to stay in the digital domain and make the job simple, painless and transparent. What more could you ask for?

Now I need an equally affordable, stand-alone signal processor....



★ Vestax

On the Road Again. The New Vestax HDR-V8



- Eight inputs / Eight direct outputs
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- Processor Speed 300% faster
- Absolutely no Data Compression!
- Balanced TRS inputs & outputs, +4 and -10.
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- Built in digital mixer with 3 band EQ and fully parametric mids
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- New easy to use menus
- Completely non-destructive (real time) editing
- One gig hard drive, user expandable to 4 gigs
- Optional DA88 and ADAT interface
- Optional SMPTE interface.
- Optional remote control (MX-I)
- Optional removable drives for data storage
- Lock together as many machines as you like.
- Suggested Retail: \$2495.00



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Fairfield, CA 94585 (707) 427-1920 FAX: (707) 427-2023

Bruce Turgon — On the road
with Foreigner and Vestax

The road can be a hard place to try and work. But travel with the new Vestax HDR-V8 Pro Series Digital Recording System, and life gets easier. That's because the HDR-V8 is a complete studio solution in a two rack space unit. With a new main processor 3 times faster than previous versions, and the eight separate inputs and outputs, the HDR-V8 is capable of simultaneous recording on all eight tracks with absolutely no data compression.

Additional features like balanced TRS inputs and outputs, 3 auxiliaries per channel, a built in digital mixer with 3 band EQ with parametric midrange, and a front panel XLR mic input with built in preamp make the new HDR-V8 a serious virtual studio for the road. New easy to use menus make completely non-destructive (real time) editing a breeze.

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!

Of course, living on the road has its price, but at least with the highly affordable new HDR-V8 Pro Series, you'll have change left over.



CIRCLE 82 ON FREE INFO CARD

INREVIEW

Sample CD Reviews

Even more reviews of currently available sample CDs

BY CRAIG ANDERTON

[Note: The companies listed are distributors of the CDs, not necessarily the creators.]

L.A. RIOT 3/ EAST WEST

Musical Style: Rap, old school, '70s, R&B, etc. Format: 62 complete song "construction sets," additional drum and bass loops, horn/keyboard/guitar riffs, individual drum hits spread over two CDs. Best Features: Well-organized and complete, with everything needed to make complete tunes. Limitations: No documentation of which drum hits are used in which loops. Bottom Line: The first two volumes were great, and #3 continues the tradition. It's perhaps a little less hard-edged, making it a useful addition to the series rather than just a rehash of previous editions. East-West (Tel: 800-833-8339). 1268 MB. \$99.95.

DRUM LOOPS/ DISCOVERY FIRM

These CDs are similar in many respects and list for \$39.95 each. Format: Loops, typically 8–24 bars, with variations in each bar so you can use the loop intact or cut it up into pieces. Some loops stand alone, while others have companion variations at the same BPM; all sounds come from samples. Best features: Attention-getting sounds (generally preprocessed), some nice grooves, cost-effective. Limitations: Only documentation is the loop's BPM. Poorly organized. No individual "hits" of drums used to make up the loops.

Following is additional information on specific Discovery Firm discs.

Reggae Beats: 66 loops. These aren't for Bob Marley-type reggae, but rather the more modern, electronic dance hall type.

They don't sound very Jamaican to my ears, but they stand on their own merits as provocative loops anyway. 398 MB. *Neo Jungle:* 65 loops. Good selection and programming — some downright inspiring — that follow the jungle format pretty closely, but total content uses less

than a third of the disc's capacity. 181 MB. *Super Bottom Break Beats*: 50 fairly long loops. Solid programming. These are electronic/synthetic loops as opposed to funky/organic, but if that's your thing, the price/performance ratio is excellent. 487 MB. Discovery Firm (Tel: 888-544-3476).

ENSONIQ SIGNATURE SERIES CD-ROM DISCS

Ensoniq's Signature Series (#1 Chicago; #2 Jazzy Jeff; #3 Steve Gadd; and #4 Keith Emerson) CD-ROMs capture the musical signature or trademark sound of a well-known artist. I auditioned SCD-3 Steve Gadd Drum Scores and SCD-4 Keith Emerson on an Ensoniq ASR-10 sampler with 16 MB RAM, SCSI, and an Apple computer 2X CD-ROM drive.

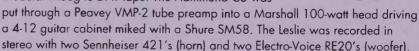
Steve Gadd's Drum Scores two-disc set features about 350 drum loops, plus drum samples of Gadd's Yamaha drum kits recorded with an AKG D-12 (kick), Shure SM57 (snare), Sennheiser 421's (toms), AKG C451 (hihat), a pair of AKG C414 B/ULS (overhead), and a Neumann U87 (ambient room) through a vintage Neve console and mixed to analog 2-inch and DAT tape.

The loops are mostly 4 or 8 bars long and include Shuffles, Latin, Reggae, Jazz, and more, all played in Steve Gadd's distinctive style. My favorites definitely are the fantastic Jazz and Samba brushes. The loops are mapped over an

octave, nontransposed, and you can trigger loops on bars 1, 3, 5, or 7. Most include snippets of velocity sensitive kick, snare, or hihat flourishes that let you interact with the loops or smooth out transitions.

Keith Emerson's CD contains synth and organ sounds provided in several forms, such as 44.1 kHz stereo version or a 30 kHz version to accommodate users with less RAM, or requiring more polyphony. A minimum of 4 MB is required; 16 MB of RAM recommended.

All synth samples were recorded directly from Keith's Modular Moog to DAT tape. The Hammond C3 was



Both libraries are well organized and a pleasure to use. If you own an ASR-10, the best investment for your keyboard (next to more RAM) is a CD-ROM player and some sample discs. [Note: Contact your dealer for an Ensoniq-approved list of drives.]

—Tona W. Ohama

PRICE: SCD-3 Steve Gadd Drum Scores (Ensoniq ASR-10, ASR-88, TS-10 and TS-12 compatible); SCD-4 Keith Emerson, each \$249.95 (Ensoniq ASR-10, ASR-88, TS-10, TS-12 and EPS-16 Plus systems compatible).

MANUFACTURER: Ensoniq Corp., 155 Great Valley Parkway, PO Box 3035, Malvern, PA 19355-0735. Tel. 610-647-3930. Web: http://www.ensoniq.com. CompuServe: GOMIENSONIQ.



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KOOPER'S KOUCH

continued from page 48

borrowed Beaver and his band to play on my album. There were also many afternoons that I sat in that little room in Hialeah and got instant lessons from, asking him, "How do you do that?" over and over again in amazement. Soon, I was a Beaver disciple on guitar. I still use many of his licks in my work today. When TK folded, he disappeared back to Arkansas, from whence he came. If you liked 'Clean Up Woman,' listen to my old album Act Like Nothing's Wrong, which was just re-released on CD by OneWay Records. Beaver is burnin' on "Out Of Left Field" and "This Diamond Ring." Sadly, his solo albums, especially his first, have never appeared on CD.

BETTER THAN BASS-IC

Herbie Flowers is a legend in England. Paul McCartney, George Harrison, and Dee Murray were just some of the musicians there who idolized him growing up. I first heard him on Elton John's album, *Tumbleweed Connection*. Again, I lost my mind. I had never heard anyone play bass like that before (still haven't).

With Elton's help, I was able to book him on some sessions over in England and was very excited about recording with him. My excitement was justified because playing with him was like sitting in music class. Herbie chooses the "road less traveled" in his selection of notes to play. He has a comparatively uncommon style for a master. He plays with a pick through a smallish amp. But you'd never know from listening to the results!

In 1971, I was recording a new album at Air Studios (George Martin's place) over in London. Herbie, of course, was on the sessions. Harry Nilsson and Richard Perry dropped in to visit one afternoon and their jaws dropped when they heard Herbie. They were gathering musicians for Harry's upcoming sessions, and pleaded for Herbie's number. I was happy to oblige. My reward was listening to Herbie play on Harry's track "Jump Into The Fire" several weeks later.

At one of my sessions, we were listening to a playback, and in this one place, Herbie played a very strange rhythmical passage. I stopped the tape: "Do you wanna punch that part in there?" I inquired innocently, hoping he'd heard the "mistake." He looked at me incredulously: "NO I DO NOT WANNA PUNCH THAT PART IN THERE. Just leave it. In ten years you'll understand



BETTER THAN BASS-IC: Herbie Flowers (far right)

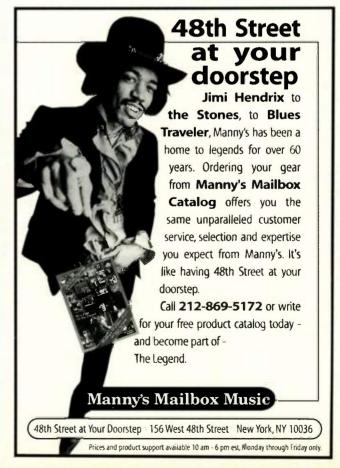
it!" Guess he told me. He was right, too!

Herbie's legacy is primarily on Elton's albums, but I've selected a few tracks for you to listen to that I'm sure you'll enjoy unless you're a bass player — in that case, you'll start feeling more like a bass owner after you've heard Herbie wail!

Start with Elton's *Tumbleweed Connection* album — I did. The best ones are "Country Comfort" and "Burn Down The Mission." Focus on the bass playing because sometimes you swear it's a guitar, but it's not. For simplicity, there's always "Walk On The Wild Side" by Lou Reed where Herbie takes a rare stand-up turn. He's also on that live Bowie album "Stages."

It's always been a great thrill for me to play with musicians I admire, and these three are some of my favorites. Hope they become some of yours, too. See ya next time!





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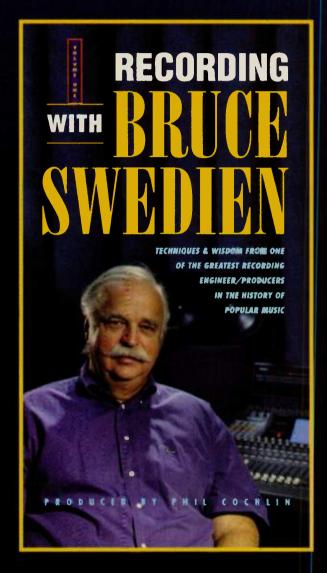
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The Moment of Truth

Sure all those new computer bells and whistles sound good, but do you really need them?

BY MARTIN POLON



o now the big day has arrived! You are about to buy your first or your latest computer for studio audio work and perhaps some other tasks. You are determined to make the best possible buy for your virtual personal/project studio, but you are faced by a distressing array of feature and software options as part of available system packages at a variety of prices. How do you make heads or tails out of this confusing matrix of features and costs?

One thing is sure. Today, the personal computer industry is selling PC systems the way Detroit's "Big Three" automakers used to sell so-called "muscle cars." This testosterone-driven computer sales derby now uses Megahertz, 8X CD-ROM speed, monitor size, and multi-GB drive capacity instead of horsepower and four-barreled carburetors to reach its mostly male audience — but the result is the same.

The computer analogy with a car is not a bad one, given that in both cases the largest and most powerful models may not ultimately be suitable for everyday functionality. The 400-cubic-inch, 350-horsepower multi-carburetored muscle car burns gas like a furnace, attracts traffic cops like honey attracts bees, requires more expensive insurance than an Arkansas politician out for a joy

ride, seats only two, has no trunk to speak of, and, in general, is impractical for everyday usage.

So one could also say the same for the "mega-featured" computers that the computer industry is now breeding. Let's examine features and identify the gap between what is being sold and what is really needed.

A. Processor Speed: You are buying a computer; not a Ferrari. Unless you are especially keen on Apple Type #11 errors with concomitant freeze and crash or Bill Gates's Windows 95 equivalent, eventually leading you back to the dreaded "autoexec.bat," excessive processor speed can kill as well as thrill! The problem is - as we rapidly approach the day where 500 MHz PowerPC chips and Intel Pentium Plus chips are the norm — that the rest of the computer architecture has not matured as rapidly speed-wise, with software the least of all. Anything faster than 200 MHz with the current state-of-the-computer-art may be running too fast for software optimized for a user base that still runs more Mac 68030 and 68040 machines that any other kind. In addition, level two caches and related logic board components may well be on the (b)leading edge of speed tolerance.

Don't get me wrong here — processor speed is very important to any kind of digital audio signal processing, recording, or editing on a computer. But there is also such a thing as too much speed if the computer in question is not completely optimized for the higher processor speeds in terms of system bus speed, system architecture, cache design, and software tolerance (for speed). Computers are being purchased by the public based on speed, the same way stereo audio systems are bought by power output in watts — the more the better no matter how it sounds!

Certainly, systems busses show no sign of easily exceeding the 50 MHz bus speed limits that allow affordable component usage on logic or mother boards by computer makers. The solution being pursued by many desktop publishers and graphics users whose power needs frequently far outstrip those of the digital audio community is the use of somewhat slower multiprocessor arrays where two or four processors (like 180 MHz PowerPC chips) work in tandem or quad to accomplish especially large-scale processing tasks. The

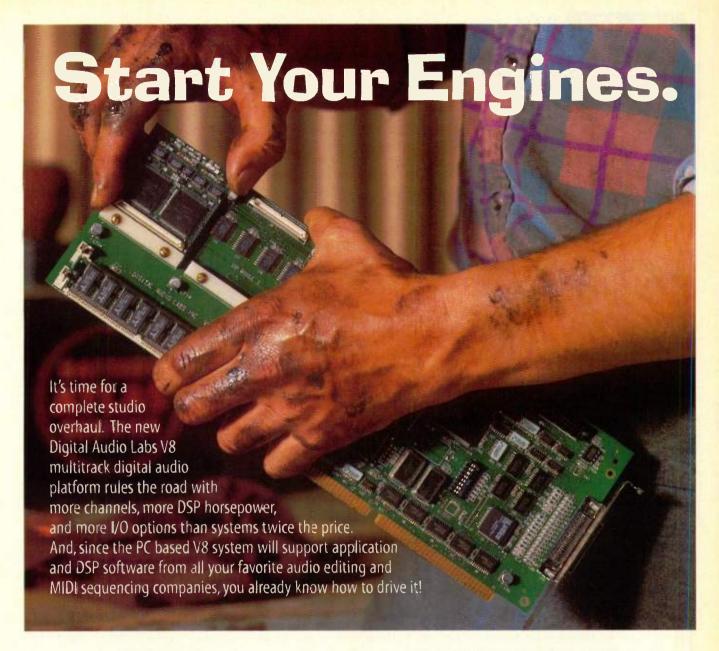
same could hold true for digital audio work.

B. Hard Drives: An internal hard drive as big as 2 GB is useful for digital audio projects, and may be optimum for the computer's operating system and other non-audio related software, but once you get to 3 GB or better, you should be using ultra-fast external drives. Jaz cartridge drives, high-speed external hard drives, and/or RAID (Random Array Of Independent Drives) drives all offer desirable features for digital audio work.

Large internal drives can require extraordinary time frames to search, index, anti-virus sweep, or run disk utilities to repair problems and/or defragment. It is also a lot like putting all your eggs into one basket. If your computer internal drive gets into trouble, you could lose everything that you have on it. And mark this fact confirmed by several research studies - computer owners with oversized drives tend to load those drives up with everything they are doing instead of using other drives in combination. In addition, to keep prices down, the speed of the installed internal hard drive on a computer is usually slower then that of specialty external hard drives optimized for audio and video work. A better bet might be to use one to two single Gigabyte internal drives plus a Jaz drive or other similar drive systems to handle projects in Gigabyte segments.

C. Internal System RAM: The old saying that you cannot be too rich or too thin or have too much RAM still holds true. Nothing optimizes computer usage, especially with digital audio or graphics tasks, as maximum system RAM. However, the use of RAM-enabling utilities for Windows and Mac or for Macintosh users Virtual Memory (with System 7.5.5), does decrease the amount of RAM needed for many tasks, and once the necessary physical number needed for your application is reached, additional physical RAM may not be necessary. Also, it may be cheaper these days to buy less RAM with the machine and add RAM from less expensive mail-order sources after sale.

The bottom line here is that it may be wiser to do what industrial and business users do and buy the specific computer, software, monitor, etc., that you need for your studio. Try not to overspend on a computer package to get the biggest, fastest, etc., that is available. In so many words, research what you need and buy what you need, but don't overbuy just to become the boy (or girl) with the biggest toy on the block.

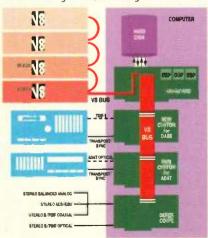


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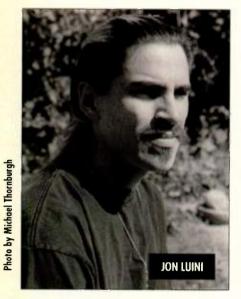


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Configure This

Getting connected and listening to audio on the Internet



BY JON LUINI AND ALLEN WHITMAN

i. See? It's next month and all your worrying was for nothing. The rent is paid and you're still here and so are we. This month we're going to walk through the set-up and use of RealAudio (which will enable you to play soundfiles from the Web) and set you on a treasure hunt. As promised, we're going to go through the process from the beginning, step by step. So, for you advanced users, either skip ahead to the prize at the end, or - better yet - read on and let us take you on a trip down memory lane. And please don't laugh at the newbies. You were there once too, you know. For those of you who are just starting, carry on!

A note here: Chances are good that some of you will have different (and older) computers. Certainly the most widely supported operating systems are Apple Macintosh and Microsoft Windows. Corporate developers create their apps (applications; i.e.,

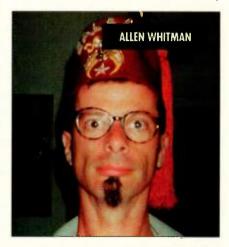
the programs that run on your computer) for the largest user base for the obvious economic reasons. Users of Windows NT, UNIX, and OS/2 may have fewer options or have to wait longer for their version of these World Wide Web audio players. For those of you with a really old computer (that would be 4 years or more, give or take a fiscal quarter), just remember technology moves ridiculously fast and you may run into stumbling blocks. Be patient. It's not you. It's that plastic box with the electronical doo-hickies in it. Perhaps it's time for an upgrade. Remember the age-old adage of computer shopping: Buy the most expensive system you can afford because it'll be obsolete next year. That's not a very amusing statement, but it is still true, now, in the Western Hemisphere, in the last days of 1996.

OK. As promised, the succinct rundown of the Web: It's a network of computers, including you, connected with phone lines of various sizes, inside of a greater network of computers that is called the Internet. That's it.

Now, here's what you need: a computer with sound capabilities, a modem [14.4k bps (bits per second) at least; for this treasure hunt, though it's advised that you get at least a 28.8k bps modem because decent sound isn't readily available with a lower speed connectivity than that] and various apps to tell the plastic box with the electronical doohickies in it what to do. These apps generally come with your computer when you buy it. Using these disparate objects, you connect through phone lines to an Internet Service Provider (ISP). Through your computer, your modem, and the phone line to the ISP (to which you have paid money for the privilege), you now have access to the Web.

The process of connecting with an ISP may take several phone calls. Shop around. The market is extremely competitive and there are many basic accounts that you can use. Tell them that, for now, all you want is to be able to send and receive e-mail and have access to the Web. Their technical staff should politely and promptly answer all your questions about getting you online. Your ISP will happily provide you with a browser (this all important "external application" will allow you to go places and look at or retrieve bits of information in the form of text, images, sound-

files, and video) of their choice. At that time, use their browser to get on the Web and find a more recent and fully



functional browser. For the purposes of this demo, the Fez Guys recommend Netscape. Use your ISP's browser to go to: http://home.netscape.com/.

Follow the instructions on Netscape's site to download the software and install it. Once you've successfully completed the installation, it's time to download and install the RealAudio player software. This kind of app (a sound or video player) is what is known as a "browser plug-in" or "helper app." With your connection open and Netscape running on your screen, go to "open location" (or, on some browsers, simply "open") and type in: http://www.realaudio.com/.

This will take you to the RealAudio site. Again, follow their instructions for downloading their player software. Chances are good they may tell you to reboot your computer after installation. Don't be confused and distracted by where they take you. We are almost certain that their motives are completely benign. They aren't interested in the hidden contents of your hard drive, they just want to sound good. Now that you have successfully installed RealAudio, you can play files from the Web that have been encoded in that particular format.

At this point, at least in this Fez's experience, the most difficult work is done. This has been the configuration process and can be daunting. But now you can go to the next place on our treasure hunt. You are over the hump! Woo-

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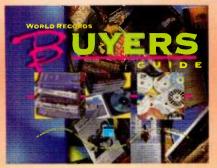
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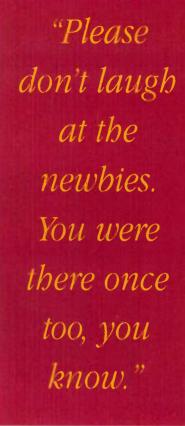
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hoo! Back to the browser, open location and type in http://www.mermen.com/ and click on the Fez with the EQ Magazine text on it. At this point, additional instructions will appear on your screen and you'll be able to let RealAudio do its thing. This ordering of folks around the Web is what some people mean by "interactive." We have a slightly different definition. You'll see.

Once you have successfully implemented these instructions, you can get any soundfile on the Web encoded in RealAudio. A cartoony "talk bubble" icon denotes that the file is for RealAudio. Web designers will usually specify which format the soundfile is compressed with.

There are a couple of other formats available, such as the Xing Streamworks player and the fabled LiquidAudio. Why not give Xing a shot? Same drill: http://www.xingtech.com/

Xing has an added feature: it also supports video. No special requirements here, just a monitor and eyeballs. When you see a Xing logo on a file you'll



be able to play it on your computer. Just click on the file and Xing will do its thing. As Xing supports both video and audio, take a closer look before clicking to know which to expect. LiquidAudio is still in the works, so we wait patiently, because we are good.

Next month: How to take your demo/studio songs and make them 'Net-ready. From the mixing board to the Internet. Plus, LiquidAudio is launched. Honest. No, really, we mean it this time....

Jon Luini is a working technophile, a musician (bass player/singer) with 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 Franciscobased band The Mermen. [mermen@mermen.com| They welcome your comments.



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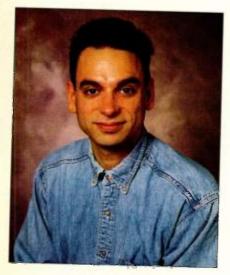
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Stocking Stuffer

Somes tips and techniques on using digital tape and the machines that love them



BY EDDIE CILETTI

October turned out to be a very busy month. The main focus - the 101st AES convention - meant wrapping up repairs, this column, and preparing for two AES workshops (vacuum tube technology and digital tape machines). All of these experiences should warm this space for the entire upcoming winter season.

That busy-ness kept me from wrapping up a special gift for EQ readers: a vacuum tube mic preamp and direct box project. Look for it in an upcoming issue. It may be at my humble web page (http://www.users.interport.net/~edaudio/) right now. Meanwhile, here are some digital stocking stuffers for you.

Best wishes to everyone in '97!

TAPE RECOMMENDATIONS

In the fall, I was invited to a SPARS meeting — the Society of Professional Audio Recording Studios — where a representative from BASF made a presentation on the subject of recording tape and its relationship with head wear. While I briefly touched on this subject in October, these points need to be stated:

- All tapes have a built-in abrasive "component" that is designed to help keep heads clean while you work. If tapes were completely nonabrasive, the heads would clog and you'd get nothing done.
- Major wear occurs during the first half of a head's expected life. This is normal. Just as an auto engine has a break-in period, it takes a while for the head's contour to precisely match that of the tape's path. And, if you didn't know, tapes differ in degree of stiffness and this alters the "path" taken.
- High humidity, smoke (from cigarettes, etc.), and dust (from sheet rock or whatever) increase abrasiveness and decrease head life. No figures were given, but 40 percent humidity is a good reference point. The opposite extreme increases the potential for dangerous static electricity. My shop is currently at 79 degrees and 22 percent humidity - the latter a 50 percent drop from summer's end - and, now, without air conditioning. Any less moisture will require a humidifier.

Certain types of tape may be better for

heads as they wear. If you stick with one brand for a long time, a tape change might yield either an improvement or a degradation. All politics aside, it really is hard to recommend the "best" tape because so many factors contribute to performance. Always check the error rate to be sure.(I am presently waiting for sam-

ples of BASF 4 mm, 8 mm, S VHS and cassette tapes, and will report my results

DTRS: WHAT IT MEANS

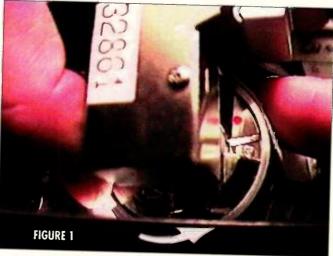
DTRS (Digital Tape Recording System) is the official name for the Hi8 digital 8-

track format used by TASCAM in models DA-38 and DA-88, as well as their madefor-Sony PCM-800. During a repair class in October, I learned about TASCAM's intensive search for the ultimate DTRScompatible tape and was given a couple of Sony DARS-60MP tapes for evaluation. They seem quite good. Look for the DTRS logo on other brands of tape as well. (A spot check at a local store in my neighborhood yielded three lengths of Ampex DA8, DTRS-certified stock.)

TAPE: VARIATIONS ON A THEME

We are all familiar with the sonic differences of various analog cassette tapes. Distortion, bass, and treble response all vary with tape formulation and thickness. Variations are corrected via record current (bias) and EQ adjustments, but cassette decks can never be optimized as easily or as well as professional open-reel equipment. User optimization of tape performance for DAT, ADAT, and DTRS is another story...

The goal for digital and analog tapes is similar: minimum drop-outs (error rate) and maximum signal strength (output level). Weak signals in the analog world result in hiss, while digital tapes are recorded at saturation (maximum) and, if the signal falls below



the threshold of recoverability, that familiar mashing, digital chain saw sound

Another fact about saturation recording is that no erase head is required. The new signal simply blasts away the old! While a single analog head

can send or retrieve tape signals, a pair of heads are required in the digital domain (both pairs for overdubs). The pairs are fairly well matched when new one head could almost do the job if absolutely no errors are encountered. Since this is an impos-



sibility time, a single clogged or worn head will send the error rate into orbit.

TRACKING: OBSTACLES TO QUICK LOCK-UPS

In addition to digital audio information, both DAT and DTRS embed Automatic Tracking Frequencies (ATF) within the usable helical recording space. (The ADAT system uses a linear control track for this purpose.) DTRS uses four repeating tracking signals with frequencies between 100 kHz and 200 kHz. This is low-frequency information when compared to the region between 3.15 MHz and 6.3 MHz, where digital information is encoded.

For DTRS, slow, multiple-machine lockups can be a sign that the tracking signals are too hard to read. Across-theboard tracking problems for all machines — including DAT and ADAT are mostly mechanically related Poor tape-path and out-of-spec supply or take-up tension can also contribute to a sluggish transport.

SWABBING THE DECK

There are many opinions about head cleaning. These are the facts:

- Use the cleaning tape when the error rate is high or every 50 hours, whichever comes first.
- Do not use a cleaning tape more than twice in one trouble period. You are better off playing a standard recording tape, all the way through, for stubborn problems. That is, if a clogged head is actually the problem.
- Head cleaning is not a panacea not even manual cleaning solves all prob-
- Manufacturers are reluctant to have "virgin cleaners" tinkering under the hood. Have an experienced tech show you how.

SHOWING YOU HOW

Hello, experienced tech here, with a pair of pictures and points on manual head cleaning. The common tools are 99 percent (low moisture/anhydrous) Isopropyl alcohol and a lint-free cloth. Both are available at your local audio support center. Moisten the cloth with alcohol, place it against the head, and rotate the head in the counter-clockwise direction. Rotation is critical because the head surface is asymmetrical, one edge being particularly sharp. Remember, a head change due to carelessness will cost you about \$750!

Fig. 1 shows a TASCAM DA-88 with obstacles removed. (Aside from the main cover, there is a support plate and an optional plastic shroud.) There is not much room to clean. Taking this picture alone took the skill of Houdini. The primary directive is worth repeating: rotate the head drum counterclockwise only!

Fig. 2 shows the ADAT head assembly. Access is easy. Care is still required.

I follow the moistened cloth with a dry cloth and repeat both procedures at least twice. Look at the cloth for dirt. Sometimes, only the small black pole pieces of the actual head chip will be dirty. Other times, the entire drum surface will leave its mark. Again, head cleaning is not a miracle cure. In fact, cleaning the entire tape path is a lesson in anal-retentive behavior. The ADAT mechanism is easier to see and clean than TASCAM's 8 mm transport. The latter is not only smaller, but access is limited by the loading mechanism. In both cases, allow five minutes for the head to dry. Afterward, use a noncritical tape as a guinea pig.

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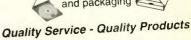






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EARTH, WIND, & FIRE

continued from page 100

He notes that this was much different from the previous EWF live album: "We recorded about 20 nights the first time I did a live album, and then I had all that music to review. I was editing eight bars from Nashville, eight bars from Atlanta, and eight from Philadelphia etc.; piecing songs together. In this situation I didn't have to do that. This time it was only two nights and the band was really prepared, so I could just pull the whole song from one night. We did have to fix a vocal line here or there and maybe a chord or two on the horns, but the only real problem I had was that the guitar connection came out once and we had to replace a couple of bars. We did that in the studio and it took a bit of work to match the sound of the recording from the show.'

One thing that Maurice did have to work on was cutting down the length of the songs. An EWF show runs about two and a half hours and would not have fit on a single CD. "It's impossible to have a show down to a specific time, so I had to cut out sections of songs to make it fit," he explains. "The songs are structured in such a way that there are solos here and there, and, of course, every night it is expected for you to play so many bars. But sometimes it will be extended because the audience might be into it a lot more one night than another. We want the listener to experience that response, so I tried to leave in as much of the emotional part as I could."

When it came to mixing, White says that he and mixdown engineer Don Murray approached the mix "pretty much the way that we recorded it — with a live attitude. Everything didn't have to be sonically perfect. There wasn't a lot we had to change, and we didn't use much reverb. The only thing we added reverb to was vocals, but for the most part it was the natural reverb, the sound of the live room, that you hear." (A total of four room mics were recorded onto a pair of stereo tracks.)

White concludes, "A live situation is uncontrollable, and we wanted to capture that vibe. You never know what's going to go down. But there's also an adventure to doing a live record just because of not being able to predict what will happen, and that puts an edge on, which I think you'll hear on the record."

JBL-SMAART REVIEW

continued from page 110

analysis. The resulting impulse response display allows you to manually or automatically set the exact delay (time for the sound to travel from the mixer output through the sound system, out of the loudspeakers, and to the microphone) in setting up the Realtime Transfer function measurements. The Delay Finder Function is also a simple way of capturing the impulse response in a WAV file for use in the Analysis Module.

This convenient form of high-resolution measurement does not preclude rigorous test procedures and the need to understand the impact that various conditions will have on the measurement. A reflection from a nearby surface or multiple loudspeakers focused on the measurement location will cause (unequalizable) errors in the frequency response. The serious user must develop a good understanding of these effects before making judgments based on the beautiful graphs produced by the program. However, this is true of all measurement systems, and this learning process is enhanced by a good system, such as SMAART, that offers a way of visualizing these effects.

The software is easy to install in either Windows 3.xx or Windows 95 and accesses the sound card through Windows without needing any special drivers. The SIA web site provides online support in addition to their telephone technical support. JBL-Smaart does not require a DSP to process the signal, instead using the CPU for this task. The speed of the analysis is therefore directly related to the processor used. A Pentium is recommended, but I was able to achieve adequate results using the 486 DX2-50 processor in my notebook computer (although JBL recommends a 486DX2-66 as a minimum). The quality of measurement is also affected by the noise floor and linearity of the sound card in the PC, in addition to their typically poor audio connectors. The exceptional Digital Audio Labs CardD+ in a 100 MHz Pentium produced excellent results during my testing, but the program can be used with most stereo 16-bit audio cards, including some of those built into the latest generation of notebook computers.

If you need to get a better picture of the sound in your life, or are simply curious about the accuracy of the front-panel controls on your EQ, then JBL-Smaart is an affordable tool with which to improve your vision.

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

GEARAHOLICS

continued from page 60

MIDI kit installed into it at an additional \$500. Now this mini has cost you \$1300 and you're kicking yourself because you passed on a mint MIDI'd mini for \$1300 in the "for sale" section of your favorite music publication.

When contemplating the purchase of a "vintage" synth, you must consider "The Hassle Factor." If a synth seems like a great deal, you must add in the cost of any repairs it may need to the purchase price. If the repair center for this synth is out of town, you'll need to factor in any shipping charges you could incur. Once you've done this math, then ask yourself if it's still a good deal. Try to buy smart.

Tony Di Lorenzo has been involved with synthesizers and keyboards for the last 20 years. He has produced his own CD-ROM for the Kurzweil K2000 and K2500 called "Producer Series Vol.1." He runs his own company called Front Room's Web page at www.interport.net/-thefront/index.html. You can also e-mail Tony at thefront@interport.net.

BOB ROCK

continued from page 70

there's obviously a lot of EQ. But it's also putting the gates in the right places; compressing at the right places in the signal path. It is a very delicate balance to get that right; to get that much top end without having the entire drum kit coming through. We use some carpet, we extend the bass drum out and make a tunnel with packing blankets — basically every trick in the book to get it. And of course, microphones are important. It's actually three mics: an Electro-Voice RE20, a Sennheiser MD421, and an AKG C12 back about eight to ten feet. The C12 is in line with the bass drum and the tunnel goes to it, but that mic is not inside the tunnel. It is right at the opening. Once we get it, it is wonderful but it is a very hard place to get to.

Are there any samples involved?

The top end is acoustic, but we do lay in samples for the low end just to keep it consistent. It's mainly the real drum, then we lay in the other stuff underneath, which is my approach to drum samples anyway.

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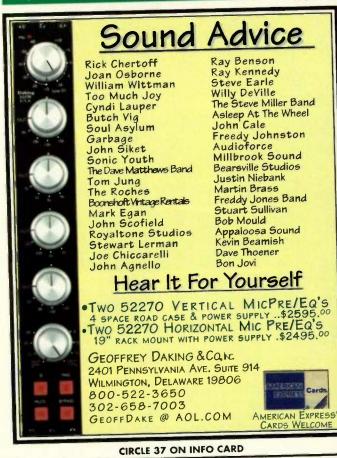
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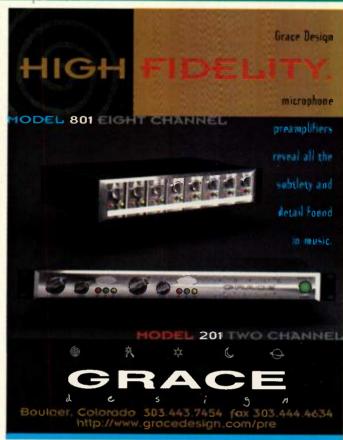


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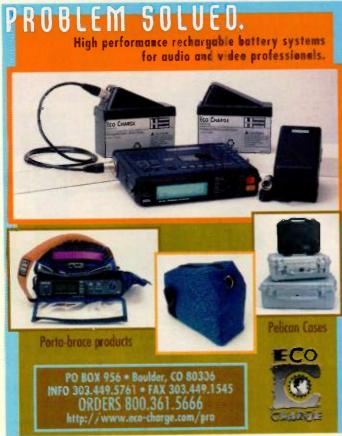
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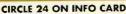


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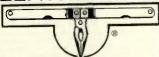


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 Cascade feature provides simultaneous parallel operation of multiple machines, and a 9-pin parailel (GPI) interface facilitates external automation

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Condenser Mic	Built-In	Buitt-In	Built-In	Buitt-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	-	010dB, -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	_	1 -	Yes	Yes	-
Playback Controls					
Prich Control	±20%	±20%	±20%	±20%	169
Bias Fine Adi.	-	_	_	1 _	Yes

Telex

ACC2000/4000 Cassette Duplicators

Designed for high performance and high production. Telex duplicators also ofter 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.

Memory Rewind

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 · Stanted work surface and "heads-up" cassette plat

- Statieu work surface and neads-up cassette plat-form 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 LEO indicators
 Side A or A'B select button
 Rewinds tapes to the beginning or

- 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.

Yes

- end automatically (AUTO mode) or
- -In AUTO mode the copy button acti vates the entire rewind/copy/rewind immediately

sequence. In manual it starts copying

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.
 ACC2000 XL Mono Master Module:
- Same features as ACC2000, plus—Extended Life cassette heads.
 ACC4000 Stereo Master Module:
 1/4 track, four-channel stereo duplicator. Same features as
 ACC2000 Mono Master Module/ ACCADON XI Steren 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
- ACC4090 XL Stereo Copy Module:
 Same as the ACC4000Copy Module, plus—Extended Life heads Configurable for chrome or fernic 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 1-2-3

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 th



Equitek Series Studio Condenser Mics

The "bench mark" for cost and performance, the Equitek series of microphones incorporate a unique servo design and excep tional flexibility to provide extra-ordinary ballistic capability and exceptional transient response

E-300

A multi-patterned side address mic that combines vintage cap-sule design with advanced headamp electronics, the E-300 has an unusually wide frequency response of 10 Hz to 20 kHz and entical applications



Unique powering of all miss is accomplished with a pair of incharge bit miss 9 work batter with community with 48-volt phantom power. This owncome inherent current limiting associated with most phantom power supplies an

E-200/E-100

- The first member of the current Equitek family, the E-200 is also The instrument of the Current Equities farmly, the E-2-OB is at a dual cappule side address multi-pattern condenser mc, 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 cappules in a supercardioid pattern

 - Frequency response of 10 Hz to 18 Mz.
- Dynamic range of 137 dB Low self noise of 15 dB



Cardioid Capacitor Microphone

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

- tor use in the most semanting apprications. Utilizes a gold-plated, "aged-dappragn" inordenier element with an internal baffle plate to increase signal-to-neise ratio, which coupled with low-noise transformeriess electronics, makes the AT4033 ideal for critical digital recordings. Dynamic range is 123 d8 without the built-in attenuator. Accepts up to 140 d8 SPL without capsule or electronic-system distortion above 154 T.H.D. and a built-in switchable 10 d8.
- tem distribution above 1% 1.PL da a bult-in syntomable I O ob (nominal) pad impreases it to 150 dB.

 2-micron-thick vapor-deposited gold diaphragm growdes accu-rate reproduction of even the most subtle sounds.

 Permanently installed internal open-cell fcam windscreen.
 Integral 80 hz hip-ass filter for easy switching frem a flat fre-quency response to a low-end roll-off.

AT4050/CM5 **Multi-pattern Studio Capacitor** Microphone

Supremely transparent and ac out sacrificing warmth and ambiance the AT4050 expands upon the AT4033. to set the standard for studio perfor nance mics. New large-diaphragm design utilizes two

capacitor elements to provide consistent superior performance in cardioid, omnidi-rectional and figure-of-eight polar pattern settings.
To achieve a warm, true-to-life sound in all

polar pattern settings, Audio-Technica valior deposits pure gold onto specially-contoured ueposits pure good onto specially-conflored large diaphragms which are aged through five different sleps to ensure optimum characteristics over years of use. The transformeriess circuitry results in exceptional transient response and cle⊇n output even under extremely high SPL conditions.



HD 265

The HD-265 is a closed dynamic stereo HiFVpro-lessional headphone offering a high level of background noise attenuation for domestic background noise attenuation for domestic listering and professional monitoring appli-cations. It is a suitable choice for monitor-ing applications in professional studios and to match the top of the range Hiff 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 HFs 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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- release times Independent switches for
- fast or slow processing

 Dial in compression up to 20 dB
 - Independent on/off vitches -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 challels, each with its own dedicated controls. A switchable 48 volt phantom power supply makes it compatible with all mics. The 107 delivers outsupply indexes is comparative with a mines. The Tot veneral out-standing sonic performance, as well as a great degree of pres-ence, detail, openness and image. It also provides extended high frequency response without ary 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 vol Phantom power with red LED indicator
 Low out filter with red LED indicator. 80Hz, 12dB/octave
 Polarity inversion switch with LED indicator.
- Individual channel remote mute capability
 Switchable +4d8 -10d8 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 solld state front and 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 circultry.

109 Parametric EQ with Tubessence

The Aphex 109 is an extremely versatile and high performance single rack space parametric vacuum tube equalizer with unique

- single rack space harametric vaccium ruoe equalizer win unique features, fexibility and sound.

 *True tube circunt (Tubessence) in the output stage for a "warm", "sweet" and "rich" sound.

 •Dual (steree) two band or mono four band equalizer configuration offers feesibility for general sweetening to critical problems 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
- Pact to both Mas + 100p+ 100p to both or but with other ordered operating (filt), sweepable frequency adjustment, variable bandwidth, and switchable peak or shewing filter mode.

 Operates in the EO flat (calibrated center detent) mode yet still passes signal through the Tubessence vacuum tube stage. This
- is helpfu! for 'warming up' digital signals. 1/5 octave to 2 octave bandwidth adjustment.
- · Switchable ·104BV/+4dBu operating level

t.c.electronics Wizard M2000 Studio Effects Processor

The M2009 features a "Dual Engine" architecture that per mits multiple effects and six different routing modes. There are 250 factory programs including reverb, pitch delay, delay, chorus, flange, phase, ambience, EQ, de-essing, comdelay, chorus, flange, phase, amblence, EQ, de-essing, com-pression, limiting, expension, gating and stereo enhance-ment. 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 volces), chorus, and delay effects are characterized by their precision and versatility. Everything from the fine and subtle to the wide

- and spectacular is nandled with equal superiority. The algo infilms 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, pated hall or compressed pitch. The presibilities are endless.
- · Tempo Tap function allows tempo to be adjusted in beatsper-minute and sub-divided any way you like-even in triplets. The tempo can also be read from MIDI Presst "Gliding" (morphing) function ensures seamless tran-sition 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-lace 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
- · Fach channel's built-in noise gate has an adjustable - Each Channel's Dullierin 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

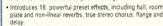
Dual 1/3 Octave/Precision Equalizer

Used extensively in recording studios since 1989, the M-EO 230 provides 60 bands of EO in a single rack space. Covering every band from 25 Hz to 20 kHz in 173 octave increments the M-EO 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.
- Non-imperiorities "Sourch in Source (jupine 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 form
 - power on/off transie
 - In/out switch allows you to easily compare your original signal to the aqualized 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 light budget, you want to check out the Nanoverb, it has the features you need to get started.



- · 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 knob provides complete control over delay time, reverb decay etc. by allowing you tweak each program until it's just nght for your music.
- with professional 18-bit A/D and D/A converters and a 20-bit internal processor that operates at three million intructions 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

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. In offers the ability to edit and store your own customized programs, to utiliz complete MIDI implementation.

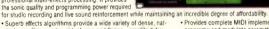
- 18-bit D/A and A/D converters and 20-bit internal processor combine with the clean effects algorithms to offer a frequency response from 40 Hz to 20 kHz and a wide dynamic. range. The result is ultra-clean, great-sounding effects for every application
- every application.

 -100 preset and 100 user-editable effects include many vari-effects 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
- 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.
- saved to a dedicated user bank.
 Responds to MIDI program change and modulation, and it
 prevides 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



- ural-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.

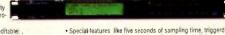
 18-bit oversampling digital converters add to the excellent audio fidelity, with a resulting 20 kHz frequency response and a dynamic range over 90d8
- Provides complete MIDI implementation, so you can change programs and modulate parameters in real time with MIDI controllers (pedals, mod wheels, etc.)

 Each of the 128 preset and 128 user-editable programs use
- one of 32 configurations, or arrangements of effects. You can set up mone or steree single effects, dual mone effects with separate mone 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 pro viding powerful multi-effects capabilities.



- volinty powerful micratects capacinises.

 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.
 - panning and surround sound encoding are also built in

 Selectable -10 dB and +4dB levels, servo-balanced TRS inputs

 - ADAT Digital Interface allows you to work entirely in the digital between the Q2 and an ADAT XT.

Personal Preamp Processor

- sion monitoring of power status and clip point input control has two
- input control has two ranges of gain, +26dB -+60dB and +6dB +40dB.
 +20dB gain boosts input level for mic usage, or pad for accepting line levels Phantom power supplies power to mics that require
- when to mics that require when you make to mics that require when you make to make the microphone placement. Output control for trimming back to unity gain.
- Genuine 12AX7 tube shapes and warms the sound d 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 & piak limiter.
 Compresses "musically" in dynamic range without any audible "pumping" or "breathing".
 Attack & release limes 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



4200A and 4400

L-C Series 1/3 Octave Active Equalizers



- The 4200A (active cut only graph c EQI and 4400 (active graph ic EQ) provide 28 1/3 date. Iters on I.S.O. centers from 31.5 Hz to 16kHz. Hand-tuned inductor/capation III-C) resonant circuits provide the ultimate in performance and reliability.
- curis provide the utrimate in performance and reliadingly.

 Better than 10x 8d signal-1-to-noise ratio with no di-gradation
 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 o'ug-in
- 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 EOs, the difference is that all functions of the 4700 are digitally controlled. Ten non-volatile curve memories and ten preset memories using

- Ten non-volatife curve memories and ten preset memories EPROM, so no need for battery backup.
 104B 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 licked together to
- form a network of equalizers. The network can be con form the first 4700's front panel or optional RS-232. PA422 interfaces. Each network features 10 user programmable presents accessible via computer control, front paris 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
 6 crossover can be configured as 2-way, 3-way, 4-way or dua. 2-way,
 4/ligustments can be performed in frequency Hzs steps, sloce
 6, 12, 18, 24 dB/oct.), shape (Butterworth, Bessil, Linkwitz-Riley)
 Parametric fifters include boost, cut, high pass, low pass, rising sheft and falling sheft, adjustable in 1 Hz steps, 1/10 dB steps
 and bandwidth from 1/70th octave to 4.8 octaves.
 Delaw up to 68 dm son each output
- · Delay up to 680 ms on each output
- · Ten non-volatile memories and presets with password security ote preset select interface includes PA42
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Compact Control Monitor Loudspeaker



The Control 5 is a high performance, wide range control monitor for use as the primary sound softice in a whicty of applications it's smooth, extended frequency response combines with wide dynamic capability to provide acoustic performance that's ideal for recording studies, AV 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 to prevent bypass capacitors for outstanding transient accuracy

 • Molded of dense polypropylene foam, with a choice of black, gray or white finish

 • Pleasmo accuracy
- leasing 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 Muti-Radial sculptured battle 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 reflect tions of the shorter wavelengths away from the listening posi-tion, eliminating baffle diffraction distortion.

 • Vertical alignment of the transducers across the baffle center
- produces natural mirror-imaging
- Pure trainium diaphragm high frequency transducer provides smooth, extended response
 Magnet assembly is shielded, allowing placement near magnetical states.
- cally 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 pro vides excellent reference in a small, portable package. It com-bines 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.

- Feetronically 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 accustical environments and achieve consistent, accurate imaging.

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 construct 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

- 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
- Third Chamles with discrete, balanced balanced inputs and 4 stereo channels (12 inputs total).

 Line inputs and outputs work with any line level, froment level, to semi-pro -10dB, to professional +4dB.
- (48v) inputs for condenser mics
- (400) inputs for concenser mices.

 Every input channel has a gain control, pan pot, low EO at 80 Hz, high EO at 12 5 kHz and two aux sends with 2008 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/ 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.

- 3-4 stere 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 EO on vocals.

 Timm controls (ch. 1-6) with ultra wide range (+10 to -40d8) handle everything from hot digital multifrack feeds to whispering lead singers and older, low output keyboards.

 Pan control with constant loudness and high L/R aftenuation so you can pan hard left are (inth without) bleet-through
- tion so you can pan hard left or right without bleed-through · Two aux sends per channel with 15dB extra gain

mante . · 60mm log-taper faders are accurate along their whole length of travel and employ a new long-wear-ing contact material for longer fader life & uper resistance to

- ing contact insternal for longer lader line a uper resistance to dust, smoke etc.

 Control room/phone matrix adds incredible tape monitoring, mixdown and live sound versatilit y.

 Multe switch routes channel output to extra ALT 3-4 stereo bus. Use if for feeding multitrack recorder channels, creating a subgroup via controlroom/phones matrix, monitoring a signal before bringing it into the main mix or creating a "mix minus"

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



Hands-down choice for major touring groups, studio session players, as well as broad cast 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 brillyplus circuitry, seven AUX sends, 3-band EQ, constant power pan controls, 10-segment LED output metering and discrete front end phantom-pow-

- . Lowest noise and highest headroom (90 dB working S/N and
- 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.
- or reserved to me · 3-hand EQ with mid-frequency sweet
- · AFL/PFL solo and mute switches with overload andsignal pre-
- sent 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

TASCAM

 ATF system ensures no tracking errors or loss of synchronization. All eight tracks of au are perfectly synchronized. It also guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks - whether you have one deck or six

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 firming.

SONY PCM-800



- · Flawless sound quality, outstanding reliability and professional audio interfacing
- riswiss sound quarry, ourstanding reliability and professional audio interracing with AES/EBU digital II/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 18 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-800 provides comprehensive remote control over all PCM-800 functions. The RM-0800 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 modu-lar digital multitrack recording. With new features and enhanced capa-bilities, 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 Omozar to-point audiocated system province 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 autolocated to the control of the contr
- tion performance and the head constantly reads ADAT's builtin 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
- Servir delariced de-pin ELOU connector operates at 4-40b to interface with consoles with 4-d be balunbal inputs/output 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
- were 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 wire ning 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 popu more bass at loude volumes than a smal near field monitor can possibly produce-the Monitor Two delivers—at a price no higher than many of these smaller speakers



- is 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
- Transcribering in requestey of the deliver a troad but hardraft frequency response from 40Hz to 18Hz
 Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy.

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 ousting injection indicated assistance with a finite fuoue surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- · Wooter blends seamlessly with the 3/4" polymide soft dome For of fluid Salamessy will be 34 pointed soft pointed and width 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 uncom-
- promised 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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- XLR-balanced mic/line inputs
- (with phantom power) accept signal levels from -604B to -44B. Analog line inputs & outputs (unbalanced) plus S/PDIF (RCA) cligital 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 ut nutside disturbances
- without outside disturbances.
 TRS Jack & level control to monitor sound with any headphones.
 Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter & 1 battery.



PDR1000/PDR1000TC **Professional Portable DAT Recorders**



- Direct drive transport with 4 heads for confidence monitoring. Oriect unive transport with a Paeas to Confidence minimoring,
 Balanced XI. R mic and line analog inputs and two RCA analog
 line outputs, Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU balanced XI.R
 Let/Right channel mic input attenuation sector(0dB/-30dB)
 48y phantom power, built-in limiter & internal monitor speaker
- Ilium nated LCD display shows clock and counter, peak level
- Informated LUO prophysystows obcora do counter, peak were 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

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, 299 (drop trame and non-drop trame) and 30 fps.

External syncronization to video, fleld sync and word sync.

FOSTEX

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 chasa sync to a master timecode. The 0-25 will resolve to extend erences such as WORD/VIDEO/DAT frame signal + WORD.

Features:

•16 MBit RAM buffer • Instant Start & Edits •Scrub from tape

•16 MBit RAM buffer • Instant Start & Edits •Scrub from tape or buffer -log/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 Foster flagship professional post production DAT recorder, the D-30 contains all the features of the D-25, plus large high resolution backfit LCD display which shows all parameters at a glance; Intultive hierachical memos from 10 dedicated soft keys; two RS-422 ports for added flexibility.





Designed for professional applications, the SV-3800/SV-4100 have highly accurate and reliable transport systems with search up to 400X normal, and 20-bit D/A converters to satis by 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 con-troller 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 con-

- nected devices.

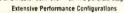
 A Global Transpose switch transposes all connected sound sources without changing the transpositional relationship
- between the individual devices.

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 syn-
- The versatility of these sounds is enhanced with 64-voice polyphony- indispensable for realistic piano sounds, grying
- you all the capacity you need for lush, sustained passages for additional texture, there is also a generous selection of built-in effects, including several types of reverb and chorus



90EX can store up to 64 Performances, which may consist of up to four of the A-90EX's preset Patches along consist of up to other or the A-POCK'S preser Fatches 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 your opnamies, from plantsmin to folie; selectable velocity curves let you choose the sensitivity that best suits a particular musical style or sound source.

 • Keyboard also offers channel affertouch-sensitivity • a power-
- ful 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

Ruitt-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

VS-880 Digital Studio Workstation

The VS-880 is an integrated digital recorder, muxer, editor and fx processor in one. A complete digital studio workstation, the VS-880 handles everything from one. A complete digital studio workstandin, the VS-Bob 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 with the internal lomega Jaz drive Y but can record 500 total track minutes or 60 minutes of recording time per track in Standard Mode on one 1GB Jaz disc

- Digital Recorder:

 Eight discrete tracks, each with eight "layers" of virtual tracks. Record up to eight Takes' per tract 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 sam-pling rates include 48, 44.1 or 32 kHz. The VS-880 is a non-linear, random access recorder/editor, so no memory is wast ed on unused tracks or blank sections within recorded tracks.
- Digital Editor:
 Non-destructive recording and editing lets you easily return to any pre-recorded or pre-edited state. You can 'Undo' up to 999 edits, even after conducting multiple recording/editing sessions. You can redo your song from any desired point, instead of going back to the beginning and starting all over Copy, move and replace like using a sequencer or word
- processor. Cut and paste on one track or on multiple tracks (like track bouncing on an analog machine)—sound qualify 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 200 Songs), complete with mixer, effects, mark and locate settings.

Studio Effects

- Optional VS8F-1 Effect Board provides two completely inde pendent 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 3-0 sound processing from the Roland Sound Space (RSS) system

 • Guitar effects like overdrive and distortion are included as well
- as a COSM-based quitar amp simulator

- Digital Mixer
- Digital mixer features 8 + 6 inputs 8 recording busses. stereo AUX send and 1 stereo master output. A coaxial digital input accepts a stereo (2-channel mono) digital signal.

 There are 4 analog audio inputs (1/4' phone and RCA jacks)
- · You can record up to 6 channels, including 4 analog and 1 digital stereo source simultaneously on 4 tracks. Using the digital coax out, you can archive your final mixes to DAT.

 For the simplest mixer/recorder configuration, the VS-880
- gives you an 8-channel mixer with mixer channels and recorder tracks corresponding directly. The Input Mix/Trac 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 Sylic sequence data form an extension must system, admin will be recorded tracks, for simultaneous playback and mix-down right on the VS-880, no submixer required.

 Built-in parametric EO, 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 snap-shots can be stored and switching among them is as simple as touching a button. Fader movements can be recorded with an external MiDI sequencer for fully automated mix-downs

- Other Features:

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



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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 qualify digital audio recording and edit-ing 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 productionlinked 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 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 4MS of RAM. By putting all of the processing power into its own hardware instead of relegating it to your PC, the SSHOR1 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 logether with sample accuracy, a feature which equires no additional confidence of hardware workings. additional software or hardware upgrades. Soundscape DAWs have rock solid' synchronization to analogue, digital or vider tape recorders and even chase timecode when varispeed is used.
Using the virtual tracks, up to 64 audio takes can be incorded at

- the same timing position in an arrangement, allowing for instance as sub mix of multiple basking vocal harmonies, dialogue or sound effects to be selected on any physical track later. Arrangements are created in the arrange window which display PARTS of a soundtrack and pay 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
- · Se'o and Multi-track audio scrubbing
- 999 named markers (insert 'on the fly)
 Realtime fade In/Out (8 selectable curves).
- · Automated Punch In/Out
- Volume contouring.
 Powerful noise gate (10 parameters with 'floor' settings to remove silence or signals from a mix, ideal for ADR).
- Normalize process to 9cB
- Steren link tool for steren earling · Varispeed ±10%
- Nudge edit using arrow keys Supports all SMPTE formats, including 29 97 and 29 97 Drop.
- AVI video file support with full synchronization (recurres Video for Wingow V1.1)
- Optional EDL File support with full auto conform via RS422
 Zoom in/out history (8 levels) Windows V1.1.

 Volume and Pan contails (real-time, non-destructive, with full
- automation via MIDI).
- automation via mitory.
 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 wirtual 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 McDI Song Positioner + MIDI clock or MIDI Time axis display in SMPTE (hours, mir., seconds and frames) or
- Measure (bars and bwats), readout of time between locators

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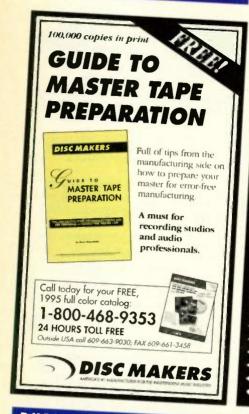
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- · Consider the quality of the company's clientele--does it work with professionals--names you recognize? Ask for references.
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ACROSS THE BOARD

continued from page 146

One is on my bicycle and the other one is on my Dad's ultralight.

- The New Bose ANR (Active Noise Reduction) headsets. I have the old ones. which we used on the Steely Dan tour. They also work great around the house if you forgot to do something that you promised your wife that you would do. You don't have to tell her that you can't hear her with them on.
- 12X CD-ROM drive. You can't believe how fast software installs at 12X. Now

you'll have to get more hard disk space.

- · Digidesign Pro Tools 4. So much new stuff has been added to the new version that it is like getting twice what you paid for (well, almost).
- · CardD digital audio interface and Fast Eddie editing software for PC compatibles. Works like a charm and doesn't cost an arm and a leg.
- · Rimage CD label printer. Laser-quality text right on the back of the CD-R. I now poke fun at everybody who writes on CD-Rs with a Sharpie. It is like the difference between hand writing and laser printing.
- · Iomega Jaz drive. 1 GB of removable

storage. Come on, get with the Gear Slut program!

- · Yamaha 02R. Don't ask, just get it. Everybody else may already have one by
- · Apogee AD-1000 Turbo upgrade. First, I guess you need the AD-1000. The Turbo upgrade includes Paq Rat 20-bit storage encoding, ADAT light pipe output, UV-22 processing, and digital input for UV-22 processing of previously digitized
- Apogee Master Tools. This is Apogee's UV-22 plug in for the Pro Tools TDM
- Pro Audio Analyzer TDM plug in from Intelligent Devices. Tell Steve St. Croix that I said to give you a Gear Slut dis-
- CD-E recorder. Yes, erasable CD-Rs are coming. Duck!
- · A copy of The Anti Gravity Handbook by Publisher's Network. Lots of fun uses. Maybe it can help O.J. with the gravity of his situation.
- · 130-watt halogen headlamp bulbs for my car. The next time some guy squeezes in front of me on the freeway, I'm gonna melt the paint off of his trunk!

That's it for now. Oh, and this year when I sit on Santa's knee I am going to be more subtle in my threats. I will just show him my piece of chalk.



continued from page 54

As project studios go, Tom's is very spacious and makes good use of all possible work space. Many studios that people are building now fall into the category of project studio, and today's available technology allows a person to spend very little and come up with good-sounding, functional environment. Of all the musicians/producers/writers that I have worked with. Tom has a good, simple work ethic when planning for growth. In looking at his situation, I was impressed that Tom does follow his own advice. His attention to detail really shows in selecting the proper equipment for his needs, present as well as future.

Dave Hampton is a veteran studio consultant with recent clients including Herbie Hancock, Marcus Miller, Organized Noize, and Marc Gorden from Lavert. His article on the building of Babyface's studio appeared in the February 1995 issue.



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What?! EO Magazine brought right to your door every month? You kids got it way too easy. In my day, if we wanted the best in project studio recording gear and techniques plus information for the gigging musician, we had to walk 10 miles in our bare feet. And do you know what the roads were paved with then? BROKEN GLASS! And the sidewalks were covered in salt. Yeah, and it was freezing cold — even in the summer!

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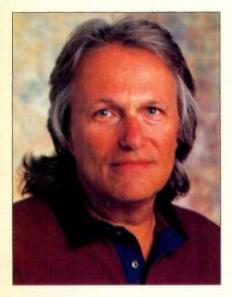
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"X" Marks The Spot

Here is my Christmas list. Better hurry, there aren't many shopping days left.

BY ROGER NICHOLS



ere it is Christmas again. Equipment has come and gone at my little studio, and I have some favorites that have endured my rages and boot-heel marks. I just hope that laws don't widen to include equipment abuse, or a lot of us will be in real trouble. Is there a Web page for "Equipmophiles" or "Basstiality"?

I don't know, maybe there is some correlation between pounding on your mixing console and kicking your dog. I have yet to see a crime scene on TV that showed a chalk outline where a TAS-CAM 24 track or a smashed guitar used to be. Maybe it is just too kinky for prime time.

NICE EQ, ROLL OVER

Steve St. Croix would get that. What a sick puppy. I hope next time I run into him that my cell phone is smaller than his cell phone. I am having a metal plate put in my head to give me a better ground plane and to shield me against the 900 MHz brain-cooking cell

phone transmitter. I bet he wouldn't go that far!

I lost my train of thought here. Oh, yes, EQ. I received a couple of the new Rane Mojo series EQs to check out. I used them last month on an album that I recorded in a real studio. The EQ did exactly what I thought it should do, without adding artifacts of its own. It is nice to turn up the midrange and not have your head torn off by phase shift or nasty harmonic distortion. If you want a good EQ that is under priced, check out the Rane gear.

It's an EQ, it's a limiter, it's a compressor, no—it's the Finalizer from TC Electronic. I have talked about this piece before, but it is really nice. Digital domain mastering for the masses. Speaking of masses, I have used it on a few gospel albums over the last few months. If you want to spiff up your demos, just connect the Finalizer in the digital stream between two DAT machines, tweak until you've got what you want, and everybody will be happier, especially the guys at TC when they cash your check.

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Since you changed the subject to limiters, I want to mention the Valley Audio Dynamap 730 digital domain limiter. It has become the mainstay in my mastering situation. You can turn up the level of your mix from 3 to 6 dB without audible artifacts. This works great for rap records that have to be louder than any other record in the stores or on the radio. I could swear that walking through Tower Records the other day I heard sound coming from some rap CDs that were just sitting on the shelf. Are these guys liable for abusing my D/A converters with those levels?

The 730 is available as digital only, or with A/D and D/A converters. The converters are excellent. They are good enough that you could use the 730 as the front end for a DAT machine during mixdown. In live recording situations, the 730 will prevent overs without distorting the sound, as would be the case if you let the signal clip.

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I can't wait for the EQ Web page to get finished. Maybe it will be running by

the time you read this. The address is www.eqmag.com. I have been surfing the 'Net for about 10 years. I think in the beginning there was just me and Steve St. Croix. There was no such thing as World Wide Web, and unless you had access through a university, it cost \$100 to \$300 per month to be "connected."

I noticed that America Online (AOL) has lowered its prices to a flat rate of \$19.95 per month if you access through AOL's network, or \$9.95 per month if you enter AOL through another ISP (Internet Service Provider). This is for unlimited use

I just signed up for WorldNet, the AT&T Internet service. It is about half of what I was paying for access, and because of their high bandwidth access to the 'Net, my 28.8 modem looked much faster because I wasn't waiting as long for routing and connections at the other end.

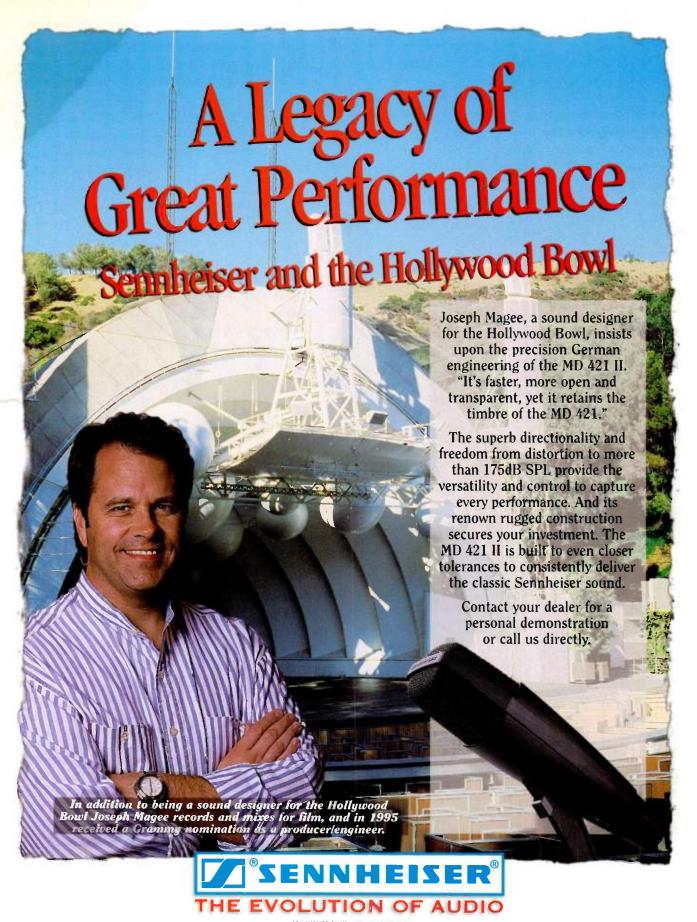
The Internet has spread so rapidly that anyone can find anything any time. Last weekend I downloaded some samples, listened to some low-res sound bytes of a new band, my daughter sent her homework to her teacher, and we ordered a pizza. Pretty good, huh? The only bad part was that the pizza place was in Palo Alto. By the time it arrived the next morning by Fed Ex in Nashville, it was cold. I canceled my credit card payment, though, the pizza place guaranteed delivery within 30 minutes or you don't have to pay. It wasn't that bad reheated anyway.

WISH LIST II

OK, here we go. This year it is going to be slightly different. I am going to include things that I want, and things that I think you should have. If you get all of this stuff, too, then it will make my life easier. "I have to get this stuff 'cause everybody else has it," will be my argument from now on.

- Another TC Electronic Finalizer. My wife stole mine and put it in her studio.
- · Valley Audio 730 Dynamap digital limiter.
- Garmin GPSMAP 195. Their latest handheld GPS. It not only has all of the airway information for flying, but includes ground references like roads, highways, rivers, cities, and state boundaries. I have the previous two versions.

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The JBL 6208 Bi-Amplified Reference Monitor



The Best System Starts with the Best Parts.

JBL has more experience in designing and building transducers for professional studio monitors than any other company in the industry. We not only use the latest engineering and design equipment, but also the most important test device of all, the human ear. We believe in physics, not fads, so while other companies pick parts off somebody else's shelf, we create our components from scratch. And by utilizing more than 50 years of experience in transducer design, we create the perfect transducer for each system.

Multi-Radial Design - An Ideal Solution to a Complex Problem.

Combining individual transducers into a system is a delicate balance of acoustics, electronics and architecture. Our exclusive Multi-Radial baffle is contoured to bring the drivers into perfect alignment, so the high and low frequencies reach your ears simultaneously. This reduces time smear for a smooth transition between the low and high frequency drivers. In addition, the gently rounded edges of the 6208 provide controlled dispersion and balanced power response. That means even off-axis, you will hear an accurate representation with wide stereo separation and an immense depth of field.

Gold/Titanium Hybrid Dome.

By mating the materials to a large magnetic structure, the 6208 can produce extremely flat frequency response and low distortion for hours of fatigue-free listening. JBL pioneered the use of the light but rigid gold/titanium hybrid construction to provide a transient response that is quick and precise for pinpoint accuracy.

Shielded Drivers for Flexible Placement.

JBL shields all of the drivers so you can place the 6208 right next to your audio workstations without interaction. Gone are the days of compromised monitor placement in your-production environment.

Why Bi-Amplification?

It's a simple fact, a separate amp for each speaker produces the most accurate sound. Each of the 6208's two amplifiers is designed to reproduce the assigned frequencies. And by combining the amplifiers inside the cabinet, you improve the amplifier's ability to control the speaker it's driving for controlled low end punch.

Just about every type of instrument through these speakers and they reproduced it with flying colors.

Bobby Owsinski EQ Magazine

Active Crossovers Provide Accurate Response Tailoring.

By carefully tailoring each amplifier's performance to the response characteristics of the drivers, you get the most faithful reproduction possible. By using active crossovers, power is not robbed by passive

components like inductors and resistors. The result is clear, accurate sound at the highest levels.





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