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Waves Native Power Pack

Emagic Zero-Loss Audio Packer

EQ
THE PROJECT RECORDING & SOUND MAGAZINE

MAY • 1997

CAR TUNES

Ben Vaughn Records In His Rambler

Remixing Tips from Guy & Lake

Ear Monitoring Techniques

Tascam & Sony MiniDisc Multitrack Reviews

USA $3.95 • Can. $4.95 • U.K. £2.95 • Issue #5
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World Radio History

Eight hybrid/discrete mic preamps offer excellent audio quality, low noise and plenty of output power (60dB of gain).

Two aux sends on each channel. Aux 1 is pre-fader for phones or monitor sends; Aux 2 is post-fader for effects.

Master section includes a dual 10-segment multicolored LED metering array, indicators for power and phantom power, level controls for Aux Return and Phones/ Monitor, a convenient front-panel phones jack, a 2-track monitoring switch and a 60mm Master Fader.

High and low shelving EQ controls at 12kHz and 80Hz, with 15dB of boost/cut. Designed for smooth, truly musical tone adjustment.

Peak indicator on each channel.

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48V phantom power for use with high-quality condenser microphones.

Stereo Tape Inputs and Outputs on phono jacks.

Aux Sends and Returns on balanced 1/4" TRS jacks.

True rackmount design. Only 3U standard rack spaces.

Line-level power input... no "wall wart" required.

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Two stereo line-level balanced channels.

Inserts and balanced Line In connectors on each mono channel.

Eight balanced XLR microphone inputs.

The best feature of our new mic preamp is the mixer.

It may look like a mixer. But when we designed the Alesis **Studio 12R**™, we implemented eight of the best-sounding microphone preamps available. In addition to high sonic quality and low noise, our mic preamps provide more than enough gain to really take advantage of digital recorders (like our ADAT-XT®).

Then we added EQ controls that bring out the best qualities of your audio sources. Big 60mm faders for precise control over every detail in your mix. Inserts on each channel, so you can record eight tracks and still have room left over for PA or broadcast. XLR inputs and phantom power so you can use the Studio 12R with any mic you choose.

Check out the new Studio 12R at your Alesis Dealer. You won't find a more versatile or affordable mic preamp...or mixer, for that matter.

STUDIO 12R

MIXER / MICROPHONE PREAMPLIFIER

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For more information on the Alesis Studio 12R, see your Alesis Dealer or call 800-5-ALESIS.

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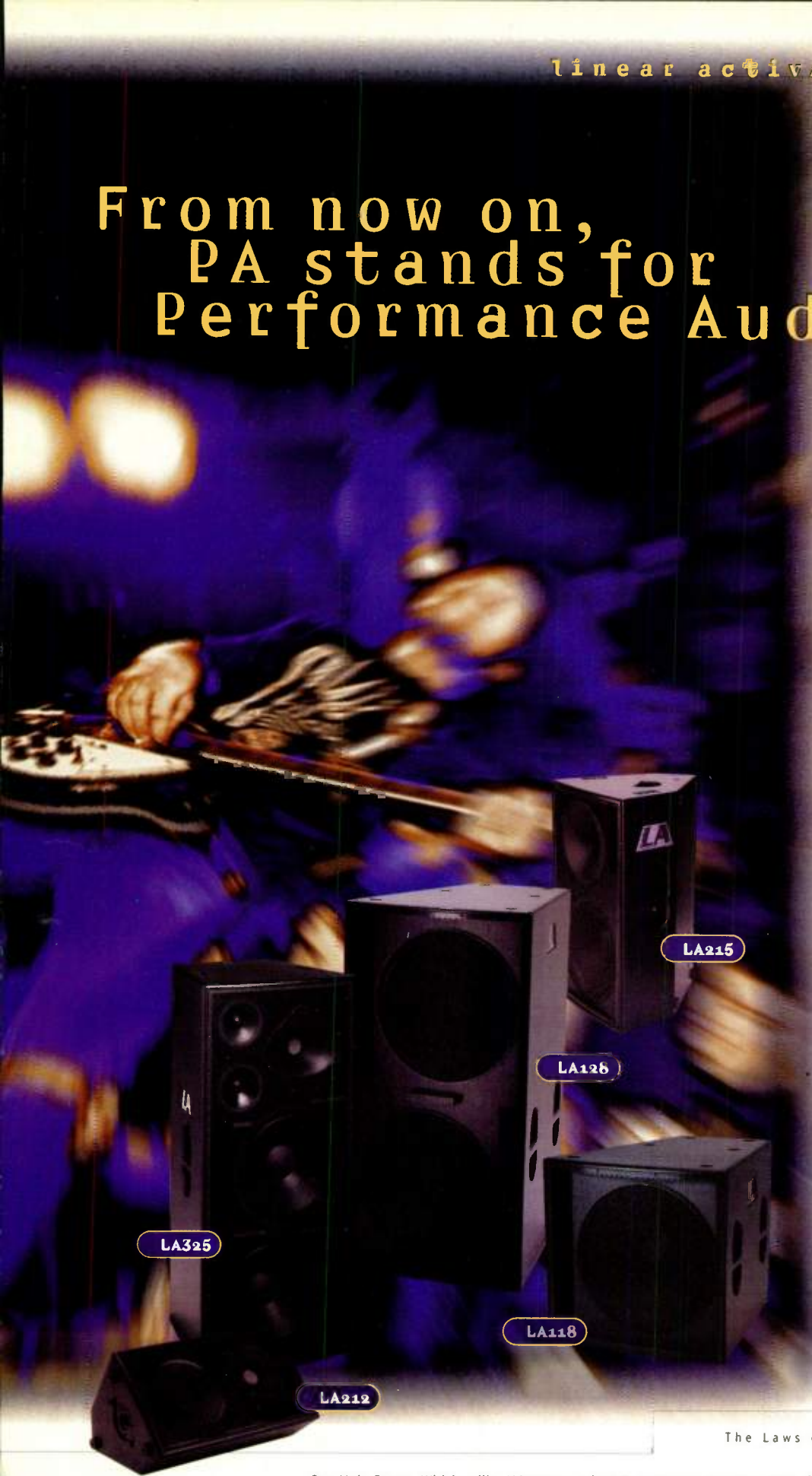
CIRCLE 03 ON FREE INFO CARD

linear activation

From now on, PA stands for Performance Audio



The truth is that most PA systems are not designed for live performance. They borrow cone drivers from instrument amps and crossovers from home hi-fi sets. They can't handle the power and they don't disperse the sound evenly. Basically, they're useless.

Linear Activation from EAW is not just another PA. It redefines the word.

LA offers a complete line of PA systems engineered by EAW – the world standard in professional touring sound. LA features the same professional cones and compression drivers, the same heavy-duty, computer designed crossover and the same road-proven construction techniques and materials. All designed to solve the specific problems of small-venue live performance.

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CIRCLE 14 ON FREE INFO CARD

World Radio History

7 REASONS TO BUY OUR TO MIX MORE CREATIVELY,

1 VLZ CIRCUITRY FOR ULTRA-LOW NOISE AND CROSSTALK. *A fancy new name for the same old circuitry? Nope. VLZ (Very Low Impedance) is a Mackie innovation based on solid scientific principles. Through the careful deployment of high operating current and low resistor values at critical points in our consoles, thermal noise & crosstalk are dramatically reduced. Open up all the channels, subs and masters on an 8•Bus console and compare what you hear (or rather don't hear) with any Brand X console. And because VLZ circuitry needs loads of high current, we ship a humongous, 220-Watt power supply with every 8•Bus & 24•E expander.*

2 IT EXPANDS ALONG WITH YOUR NEEDS AND BUDGET. *You'd be surprised just how many 8•Bus console setups like the one below are currently in use. But you don't have to start out this way. Start out with a 24•8 or 32•8 and then grow your 8•Bus console 24 channels at a time with our 24•E add-on modules. 1, 2 or even 3 of 'em connect in minutes. They come with their own 220-watt power supply; optional meter bridges are available.*

3 IMPECCABLE MIC PREAMPS. *A console can have motorized doofiammers and an optional MIDI espresso attachment, but if the mic preamps aren't good, you don't have a fully-useful production board. Our discrete preamps with large-emitter-geometry transistors have won a critical acclaim for their exceptional headroom, low noise (–129.5dBm E.I.N.) & freedom from coloration. VLZ circuitry in the preamp section also reduces crosstalk.*

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

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

Above: 32•8 with optional MB•32 meter bridge and stand.

7 MAC® & WINDOWS® 95-BASED AUTOMATION THAT'S RELIABLE, PROVEN AND AFFORDABLE. *Along with affordable digital multi-track recorders, the Mackie 8•Bus has made it possible to do world-class productions on a modest budget. But until now, Big Studios have still had one remaining and unattainable creative "secret weapon"... computerized level automation. That's why we developed the UltraMix™ Universal Automation System. It gives you fully editable and recallable control of input, channel and master levels – plus features not found on even the most expensive proprietary Mega-Console automation systems. Equally important, it doesn't degrade sound quality, introduce zipper noise or cause audible "stepping." UltraMix is currently being used to mix network television music themes and on several major album projects – by seasoned engineers who grew up on Big Automation Systems. Their verdict is that UltraMix is a serious automation solution – stable, reliable and frankly easier to use than more expensive systems. The basic system controls 34 channels and can be expanded to as many as 128 channels. UltraMix Pro™ software, for 030/040 & Power PC Macintoshes and PCs (Windows® 95 required), includes a wealth of features like editable fader curves, built-in level display, up to eight subgroups, SMPTE time code display, event editor with pop-up faders, optional control of outboard effects devices, and the ability to play Standard MIDI files from within the program.*

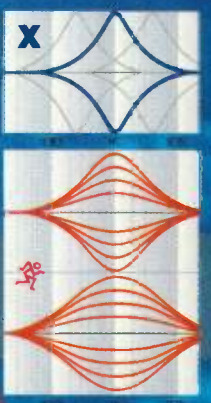
UltraMix™ includes the Ultra-34 Interface, UltraPilot Controller and software for $2797 suggested U.S.. retail. Macintosh® or Windows® 95-compatible PC not included.

World Radio History

8-BUS CONSOLE... AND 2 TIPS ON HOW EFFICIENTLY AND, WELL, MORE FUNLY.*

5 **PROFESSIONALS REALLY USE THEM.** *The members of Boyz II Men could have afforded any console they wanted for their studio's second room. They chose an 80-input 8•Bus setup with 102 channels of UltraMix™ automation. In the studios of artists as diverse as k.d. lang[1], Yes, Queensryche, Aerosmith, Lee Roy Parnell, Bryan Adams, Carlos Santana, Whitney Houston, Eric Clapton & U2, our consoles really are used to make great music.*

6 **WIDE MID RANGE EQ.** *Whether you're tracking or mixing, equalization is one of your most important creative tools. Mackie's 8•Bus consoles feature extremely-wide-bandwidth peaking EQ that can be used to achieve effects that simply aren't possible with narrower EQ. Most Brand X midrange EQs have a fixed bandwidth of about 2 octaves (blue graph at right). You can sweep it up & down the frequency spectrum, but the "sharpness" of the EQ curve is always the same. This kind of EQ is good for some purposes... but if you've worked with it before, you know it's too drastic and localized for gentle changes in overall tonal coloration.*



The 8•Bus' true parametric Hi Mid lets you spread the bandwidth out to as much as 3 octaves (red curves above). That extra octave of "width" gives you a whole new creative palette.

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

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

8 **WHAT ULTRAMIX AUTOMATION CAN DO FOR YOU:**

- *Hone a complicated mix one track at a time with every fader move recorded*
- *Clone your best fader moves and use them in other places in the mix*
- *Automute unused sections of your tape tracks or noisy MIDI sound modules*
- *Via automated mute or fader cuts, make a composite mix ("comp track") from the best moments of several tracks of the same vocal or instrument*
- *Save mixes for recall and editing at any time (great for mixes with music beds or "donuts")*
- *Make six voice-over versions of a jingle mix – and then easily make the inevitable nitpicky client changes three days later*
- *Step up to big-league automation without breaking the bank!*

9 **LEGENDARY RELIABILITY.** *One of those factors you probably don't think much about – until your console goes down in the middle of a critical late-night session. Built with pride in Woodinville, WA USA, Mackie 8•Bus consoles have an enviable three-year track record for enduring continuous, round-the-clock use and abuse.*

* Poetic license applied for.

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

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CIRCLE 31 ON FREE INFO CARD

World Radio History

EQ
PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 8, ISSUE 5
MAY 1997

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ON THE COVER:
Ben Vaughn sits in his car...er...recording studio. Photo by Greg Allen.

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World Radio History

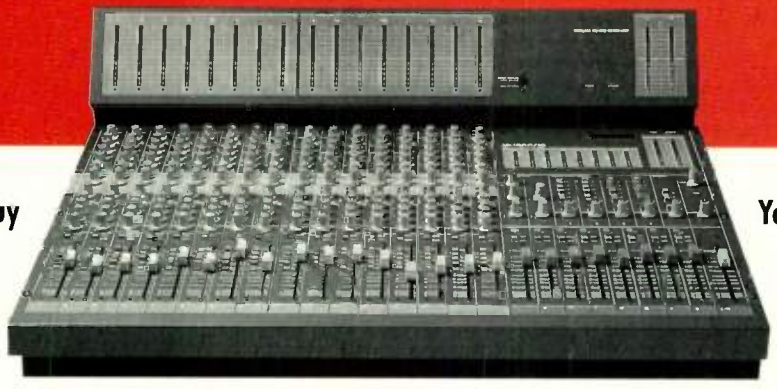
"Check's in the mail."

"My dog ate it."

"Use a live board for recording..."

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

WE WON'T INSULT YOUR INTELLIGENCE.



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

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

Live Boards Waste Inputs When Used for Recording

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

No Patching and Repatching

Another thing a recording console will save you is hassling with cables. That live board has only 4 sub-masters. So, if you want to send multiple signals to any of the 8-tracks, you'll need to patch and repatch. And forget about soloing that submaster. Can't do it! With the M1600 just push buttons. It's that easy.

Killer Mic Preamps and the Sweetest EQ

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

Serious Monitoring. Inputs a Plenty

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

You Can Expand It, Too!

Best part is you can buy the M1600 and its optional meter bridge for about the price of a basic live board. How can TASCAM do it? By not making you pay for stuff you'd never use — like mic inputs. When was the last time you used more than 8 microphones simultaneously for recording? Chances are never. But if you ever do, you can easily expand your M1600 with the optional TASCAM MA8 eight channel mic preamp — giving you 8 more killer mic preamps.

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

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TASCAM®

TAKE ADVANTAGE OF OUR EXPERIENCE.

*16 input model gives you 32 mix positions; 24 input model gives you 48. Manufacturers suggested list prices: $1699 for 16 inputs and $2,199 for 24 inputs

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You're Surrounded

Who's holding up surround sound? You are. That's right. You with the hair down to your butt, the tattoos scribbled all over your arms, and with hoops punched all over your face — you're the one who is stopping progress when it comes to the next dimension in recorded sound.

Despite our industry's reputation for being on the cutting edge of reality, when it comes to the tools we use to make our music we tend to be the most conservative bunch around. We use the same microphone that created the lead vocal for our one-and-only hit single. We use the same EQ that the Fab Four used long before we were even born. We use the same tape formula that we've always used — simply because we've always used it. And we go to the same commercial studio because that's where *Billboard*'s #1 album was also mixed.

Oh, and we still mix down to stereo because everybody else still mixes down to stereo. Surround sound? Name one hit that was mixed in surround. Name one great record that was recorded in 5.1. Name one megastar who's pushing the sound barrier.

Yes, the creative music community that George Massenburg so eloquently prodded to begin thinking and creating and dreaming in surround is the same community that is holding up progress. The tools already exist — Neve Capricorns, Euphonix CS3000's, and even Yamaha 02R's already contain the necessary software to create an emotive and effective 5.1 surround-sound mix. Mix masters like Alan Parsons, Robert Margouleff, and Tom Jung are already exploring this new dimension in sonic seasoning. And the leading edge of audio recording these days is no longer coming from the music side, but rather it's happening in the film sound stages and multimedia mix suites where surround sound is already established and the norm.

Why the rush? There are already millions of Dolby Pro Logic receivers in home theaters around the world, ready to play back audio-only surround-sound mixes. And a theater sound company called DTS is making serious inroads on the music-only front, offering superior sonic quality for those of us who ordinarily don't mix to picture. What's more, DVD is already on store shelves and some form of multichannel sound will likely be the way DVD music and sound is delivered to a future generation of record buyers.

Surround sound requires some changes, of course. What it takes is thinking beyond our traditional left/right orientation. What it takes is trying out and exploring some new creative recording tools. What it takes is convincing the artists with whom we work that they should spend that extra time to prepare their masters for future surround-sound releases.

The creative tools exist. The delivery systems exist (and will likely continue to proliferate). The content creators and producers (that's us) are the only ones holding back the inevitable tidal wave of surround-sound product.

Let's get with it. Let's let go. Let's make the future of recorded sound happen. It's all in our hands.

—Martin Porter, Executive Editor

World Radio History

AMEK RNCL

The Compressor

The tradition · The pedigree

System 9098
Dual Compressor/Limiter
by Rupert Neve the Designer

The addition of a new Compressor/Limiter to my SYSTEM 9098 product family is justified by the continuing popularity of the famous old 2254 devices I designed in the late 1960s. More than 25 years later, their performance undeniably still brings benefits to engineers and producers seeking inconspicuous control over the dynamic range of microphone signals. Just as importantly, they are used today in digital recording to manage critical levels, to preclude the effects of hard, unforgiving clipping and to impart warmth.

In those days, the Compressor/Limiter had to be almost all things to all men. Controls had to be accurately calibrated for the broadcaster and have the right subjective 'feel' for the music engineer. Attack and decay times, the rate of change of slope, the order of harmonics generated by the non-linear transfer characteristic etc. were arrived at empirically after a lot of listening with golden-eared people. The result was a Compressor/Limiter, the 2254 and its later derivatives, which sounded right and over the years achieved an amazing reputation.

The same principles have been applied to the new SYSTEM 9098 Compressor-Limiter. Considerable advances have been made in technology and I am now able to provide a much more flexible device which retains all of the character and musicality of the original design while incorporating some exciting new features.

Ratio, Threshold, Attack and Release are familiar controls with recognisable ancestry but an important new feature called Ambience has been introduced.

Operating the Ambience switch does not affect signals above the threshold but reduces or mutes signals below the threshold level. The effect is rather like a Gate but is much more subtle. Not only steady background noise but fluctuating ambience and apparent reverberation time can be reduced at will with the Gain control. For example unwanted environmental sound can be re-balanced, or even eliminated, from speech recorded out of doors. The Ambience control will also regulate reverberation - for example, a large reverberant studio can be made to sound like a small speech booth.

The 9098 Compressor-Limiter has a totally analogue signal path which employs transformers at both the input and the output. For the highest possible performance, input and output interfaces must be insensitive to anything other than the signal we want to receive - or there is little point in striving for excellence in the unit itself.

The heart of a Limiter or Compressor is the gain controlling device. The original 2254 used a diode bridge in a classic balanced ring modulator configuration. A very similar technique is used in the 9098 Compressor/Limiter except that semiconductor devices and amplifiers have greatly improved in the last 30 years. For example the original 2254 design had a noise floor of about -55 dBu. Noise performance of the 9098 unit is 35 to 40 dB better.

I believe that the new SYSTEM 9098 Compressor-Limiter continues the rich heritage of earlier designs and its flexibility and extremely high standard of performance will find many satisfied owners in all areas of audio production, whether recording, post-production, mastering or live performance.

Rupert

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World Radio History

LIFESAVER

I am a faithful subscriber to your magazine and have had a project studio for quite some time. (Starting with a dubbing cassette deck and a synth.) Needless to say, your magazine has helped tremendously with my improvement in recording and production techniques. For the past three years, I've advertised for studio time off and on and started getting new clients. This was very exciting for me, and helped to fund equipment upgrades and expansions, etc.

I am writing because I am very lucky to be alive right now. Last night, five armed men came with ski masks to rob my home and studio. Fortunately and by the grace of God, I was unharmed. I can only say that it was a complete miracle because no one was hurt. My pregnant wife had locked the house portion of our building when she heard the commotion and started calling the cops. We have an alarm that was going off, but I was forced at gunpoint to turn it off.

I never thought that my studio would ever be a target nor that possibly one of my clients would mastermind this, but it keeps boiling down to someone who possibly saw my equipment (a couple of ADATs, rack of MIDI gear, mixer, speakers, Mac, etc.).

I want to spread the word to my fellow subscribers and readers to watch out who you bring in to your project studio (or commercial studio). Take careful precautions with clients while working late. If your bread and butter comes from these clients, then take adequate security precautions. All the music in the world is not worth losing your life or the life of a loved one when you're the target of a random act of violence because of your studio gear. I think it's especially relevant since the latest results from reader surveys indicate that the quality and price of gear in project studios is starting to rival those of million-dollar commercial production facilities. Anyway, please pass the word along — it may save someone's life.

Ed Ulloa
105036,1247@compuserve.com
[We have printed Ed's e-mail address as he is interested in readers' comments. —Ed.]

AL'S FAIR

It's great to read Al Kooper's articles in *EQ*. He's truly one of rock's pioneering musicians, and his recollections of players, studios, and sessions are priceless.

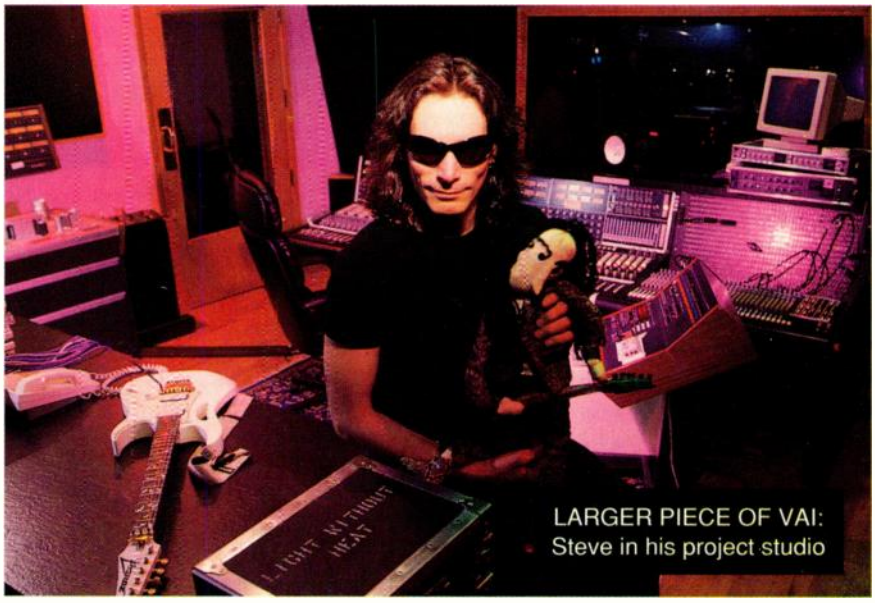
I recorded and toured with Al back in 1979 when I was playing guitar for the late Ricky Nelson. Al was a trip — you either hated the guy or (like me) found him fascinating. In the studio, he was like a ringmaster at a circus, combining all sorts of great players together who, in most cases, would never share a session together. Like combining players such as Keith Allison with Dr. John. But, in most cases, it worked!

Al's edge is hard to find these days; in such a homogenized, safe recording world. Why he ever came to Nashville I'll never understand — but that's Al. Expect the unexpected.

I hope *EQ* continues to tap the minds and memories of more giants from the '60s and '70s. It makes fascinating reading. After all, who gives a damn about what microphones the latest grunge bands use in their studios when we can find out who played lead on "You Really Got Me."

EQ is the best of all the recording magazines. It is required reading at my studio.

John Beland
Flying Burrito Brothers
Hendersonville, TN



LARGER PIECE OF VAI: Steve in his project studio

PHOTO BY EDWARD COLVER

LARGER PIECE OF VAI

The March '97 issue was great. Being a guitar player and recording engineer, I found the articles very interesting. It was wonderful to finally see Steve Vai's project studio profiled, but I thought that given the extreme talent he has as an engineer and producer, as well as a great musician, you could have given us more — like an in depth interview discussing some of the strange recording techniques he is known to employ or his thoughts on recording electric guitar, acoustic guitar, and vocals (now that he sings). His new album *Fire Garden* has some very thick, rich, and even unusual sounding vocal tracks. The big photograph was nice, but, unfortunately, bigger than the article. Please do a follow up on this interesting but brief profile of Steve Vai and his studio. If you do, you'll be the first, I haven't seen any other recording publication cover him in any depth.

Adrian Galysh
Pittsburgh, PA

CUT IT OUT

After reading the Demo Queen's "Backstage or Bust" article in the March issue, I took a pair of scissors, cut it out, and taped it in my wife's copy of *Cosmo*.

It reads much better there.

Steven Sena
XS Sound
Berkley, CA

WRITE TO US

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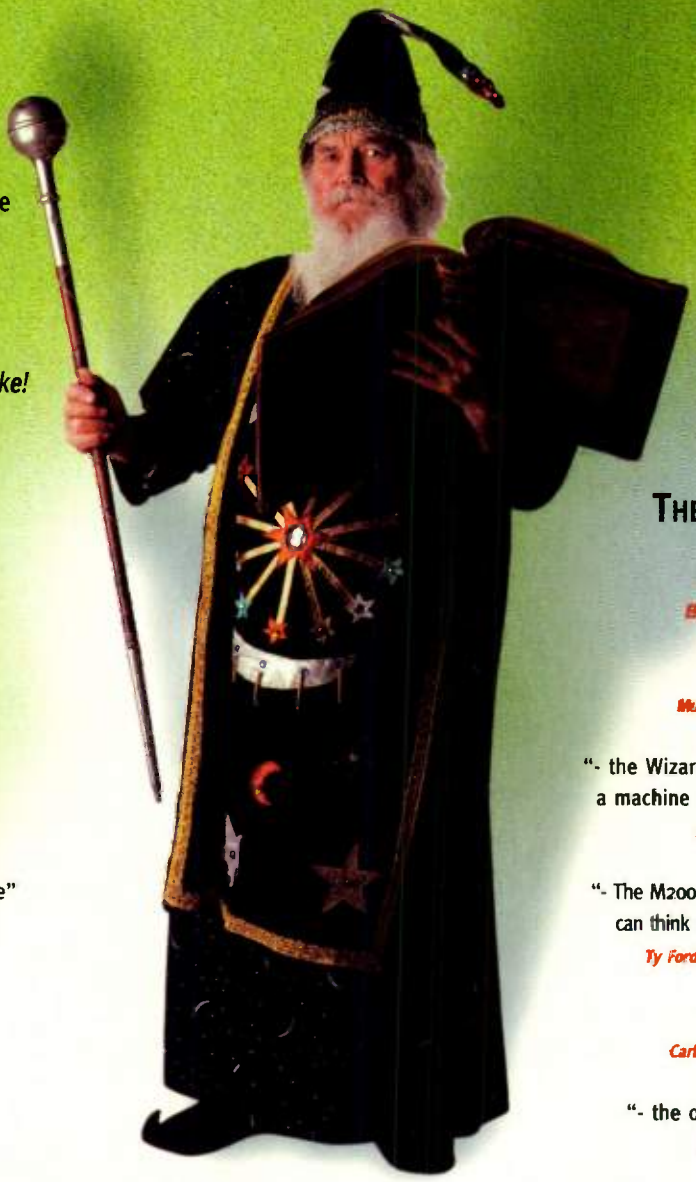
PROUDLY PRESENTS:

The Wizard of Ahhhhs!



When TC Electronic set out to make the innovative Wizard M2000 and Finalizer we knew we were in the process of creating something truly unique. But let's be realistic for a moment: *That's a statement everyone could make!*

Don't take *our* word for it! - take *theirs:*

THE WIZARD FINALIZER:

"Master Piece"
Hugh Robjohns, Sound On Sound, December 1996

Editors Pick 1996
Musician Magazine, December 1996

"My wife stole mine and put it in her studio"
Roger Nichols, EQ, December 1996

"- the Finalizer offers a tweaker's paradise"
Ty Ford, Pro Audio Review, February 1997

"Very few products have thrilled me like the Finalizer"
Florian Richter, MusikMagazin, February 1997

"Resistance is useless"
Fritz Fey, StudioMagazin, Oktober 1996

THE WIZARD M2000:

Editor's Choice 1997
Electronic Musician, January 1997

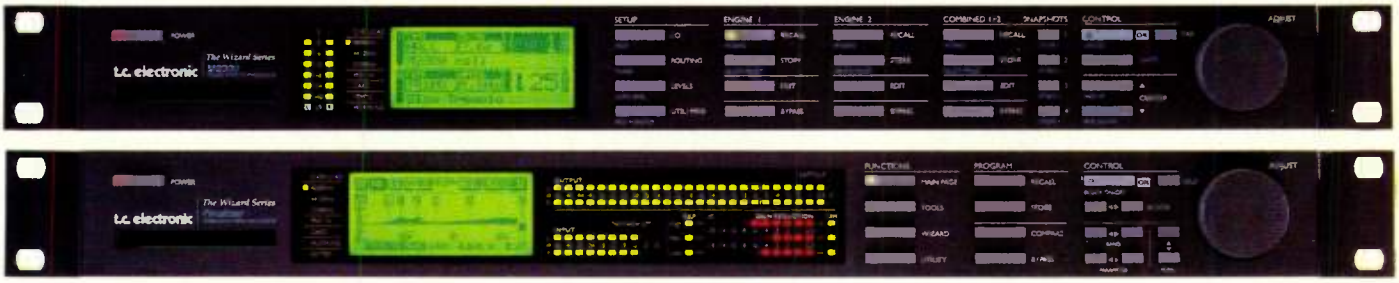
Editor's Pick 1996
Musician Magazine, December 1996

"- the Wizard stands up to the comparison with a machine costing more than twice as much"
Mark Frink, MIX, October 1996

"- The M2000 will put you just about any place you can think of, and a few you probably haven't"
Ty Ford, Pro Audio Review, July/August 1996

"TC scores big again!"
Carl Coryat, Bass Player, August 1996

"- the overall impression was 5 Stars"
Roger Nichols, EQ, April 1996



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PREAMPLE

Q *I am currently using a Fostex 812 mixer to mix seven analog tape returns and four or five sequenced tracks (mainly drums). I have a feeling the mic preamps on my board are giving me less in the way of frequency response than perhaps another board would because my drum tracks sound kinda thin compared to my tape returns (which are recorded direct to tape through an external mic preamp).*

When you have "high-quality" mic preamps on a console, do they affect just the XLR mic input, or both the XLR and the 1/4-inch inputs? Do mic pres have any impact on the sound of the tape returns? I've had a hard time finding an answer. Also, is Fostex abandoning its mixing console product line? I have been unable to get any detailed information on MIDI expansion (automation?) for the 812. There is an expansion port on the back of the board that I believe is for this purpose. If Fostex is no longer developing/supporting this product, then perhaps I should consider buying a Mackie?

K.R.
via the Internet

A Fostex consoles are typical of most moderately priced mixers in that the mic preamps work on any mic input signal (XLR or 1/4-inch) and are bypassed on line inputs and tape returns. Line-level signals will almost always sound "hotter" than mic level signals because line-level signals are approximately 50 dB higher in level. (You are probably familiar with the psychoacoustic phenemonon wherein louder is better.)

The 812 is a damn good mixer, but Fostex has discontinued its mixer line and Mackie is one of the main reasons why. We proudly used a Mackie product to demonstrate our hard-disk recorders at the recent AES show in L.A. And at last blush, Greg was the proud and happy owner of a Fostex Multitracker. So there you go....

Budd Johnson
Jordan & Johnson Fostex

WHICH TUBEY YOU-BE?

Q I am struggling over whether to buy a tube preamp or tube compressor. Can a tube compressor act as a tube preamp?

Mark F. Scarboro
via the Internet

A Perhaps the most simple answer is "why not have both," since some manufacturers integrate mic preamps and dynamics into one package. Now the fun begins...

Many people associate a particular "sound" with tube gear. Call it "warmth" or "soft focus" or whatever, it's not just the tubes, transistors, or op amps, but more the circuit design and implementation that are the determining factors. Some tube gear will be more colorful than other tube gear. What is right (and what you need) will be determined on a case-by-case basis.

If you want the full effect, go for all-tube products such as those made by Manley, ADL, and D.W. Fearn. The better hybrids are made by Summit and Tube-Tech, with more affordable options from Bellari/Rolls, Aphex and Drawmer, among others.

A compressor/limiter is more versatile than a mic preamp, but remember that heavy compression brings up the noise floor. Therefore, apply compression with discretion. Low-noise mic preamps are likely to have a transformer at the input and possibly at the output as well. Transformerless gear is typically more affordable, and may be more transparent, but not necessarily as quiet — although there are high-performance models out there with prices to match.

Eddie Ciletti
Manhattan Sound Technicians
NYC, NY

IT'S A MATTER OF DEGREES

Q I see some of the new Electro-Voice loudspeakers have a 60-degree x 40-degree coverage pattern. While I see that that coverage pattern is fairly standard in the upper end and touring markets, it's narrower than most loudspeakers sold through music stores. What's the advantage of such a pattern?

Mary Hatfield
Springfield, IL

A E-V figures that at least 75 percent of all live music is performed in smaller, indoor rooms with marginal-to-poor acoustics. Yet virtually all loudspeakers sold through music stores, until now, produce a wide 90-degree x 40-degree

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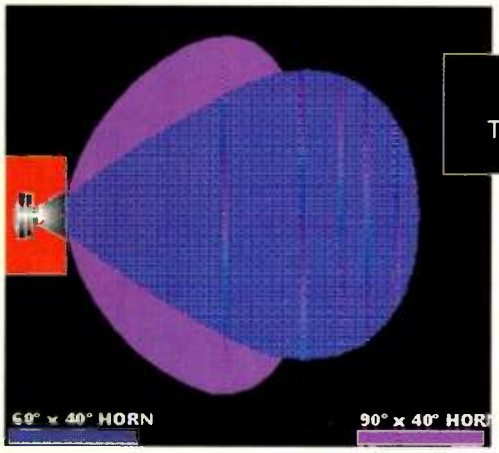


A MATTER OF DEGREES:
The difference in coverage patterns

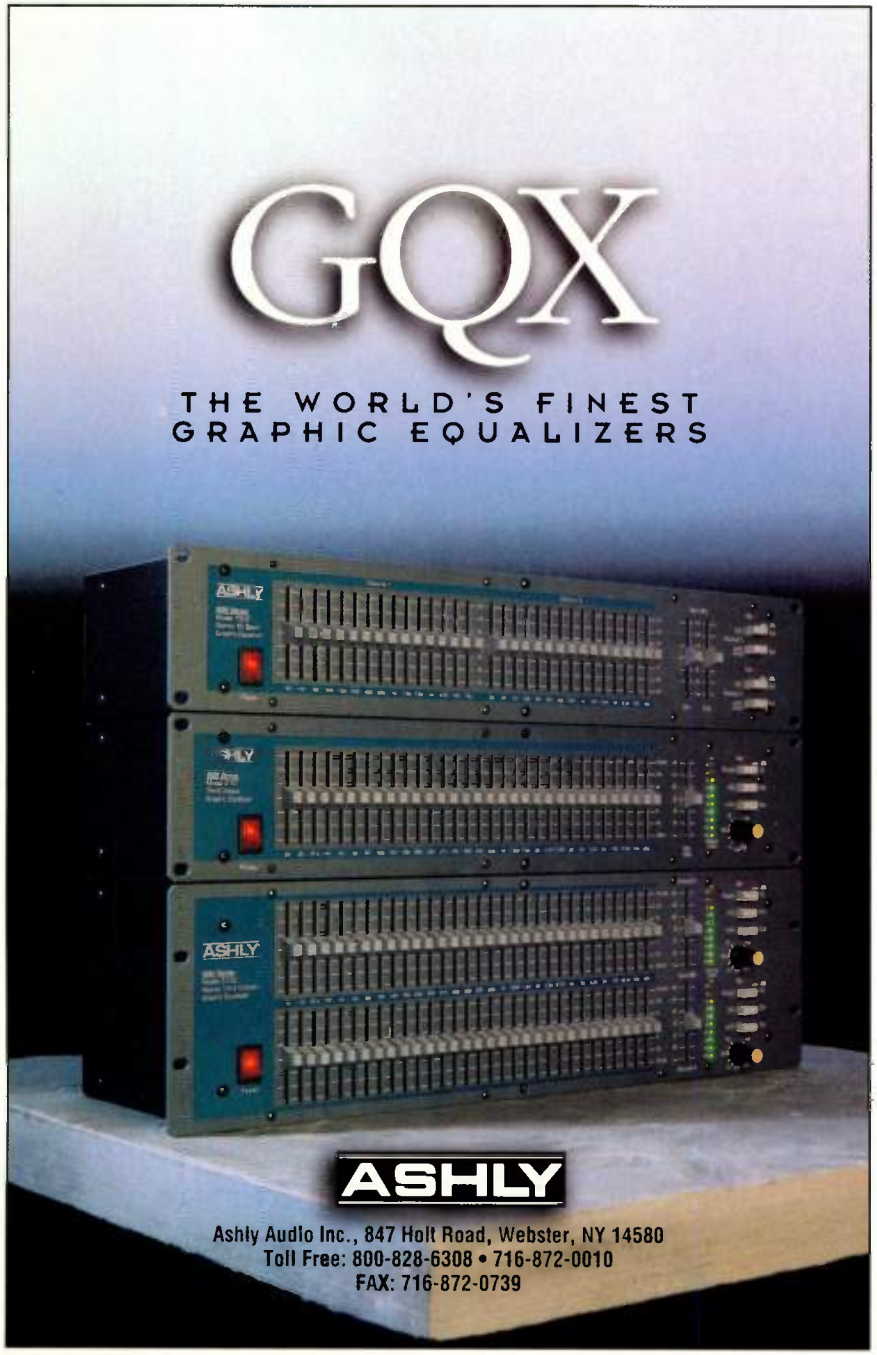
coverage pattern. The combination of small, narrow rooms and wide-pattern loudspeakers spells real trouble acoustically. The result is poor vocal intelligibility, very little throw to the back of the room (where the sound mixer usually lives), and general lack of clarity in anything above 3 kHz.

The culprits are early sound reflections off adjacent walls and ceilings. What the audience and the sound mixer hear are a combination of direct sound from the loudspeaker and the sound reflected off the walls. The result is the smeared sort of sound described above.

Electro-Voice has been building very-narrow-throw loudspeakers for touring markets for many years. Some of these boxes, like the Electro-Voice MTH-2.5/22, for example, have coverage patterns as narrow as 20 degrees x 20 degrees. This "surgical" approach, especially in touring, allows for building precise speaker clusters or arrays, where a few wide coverage boxes are used as short-throw devices for the front few rows of the audience and many more narrow coverage speakers are used to pinpoint sound coverage over the long throw to pump sound only where its is needed in the back of the room. This minimizes coverage overlap from adjacent loudspeakers and avoids reflective surfaces.

The introduction of the T-Series and S-Series boxes make Electro-Voice the leader in applying this principle to music store loudspeakers. It is common sense, really. In a small, live space, with lots of reflective surfaces, a loudspeaker with a tighter pattern will sound better than a wide-coverage box. Also, since bass response is usually more a matter of power, improving vocal intelligibility and musical clarity is what is truly difficult. These new E-V narrow-coverage stage speakers now provide the small-to-mid-sized sound system operator with some of the same advantages or tools for improving intelligibility and clarity that were previously available only in big-time, large-format concert touring rigs.

Paul Fidlin
Chief of Loudspeaker Engineering
EVI Audio



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The EVENT you know...

(and love :-)

Even if you've never heard of Event (possible—especially if your last name is van Winkle), you already know us very well. Because Event is made up of folks who've been major players in the music and audio industries for a long, long time. Folks who've designed and manufactured some very highly respected and innovative pieces of gear—some of which you may very well own (all the cool people do).

EVENT ELECTRONICS

We founded Event on the principal that "the customer is precious." That means we make only those products that our customers want, need, and can afford. Products that provide access to new levels of musical expression. Products that put high-end, professional tools in the hands of us mere mortals. (That's right. We use the gear we make, so we build the stuff that we want in our own setups.)

We began our business with the microphones and speakers you see pictured on this page. Thanks to you—and to the kind support of the industry at large—these products have been tremendously successful. We want to give our heartfelt thanks to all of you who have bought a set of our speakers or a RØDE™ microphone. We hope you've gotten as much pleasure out of using them as we have.

...is just getting started. And now...

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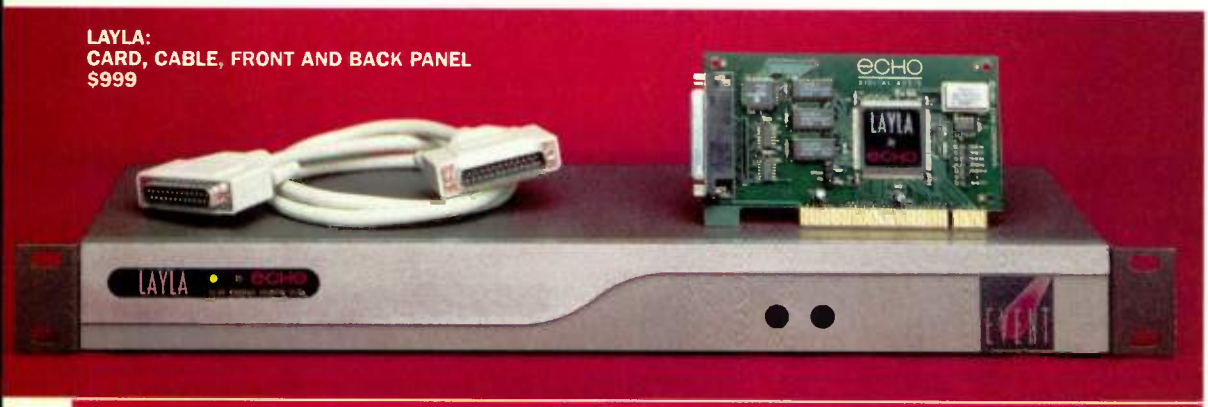
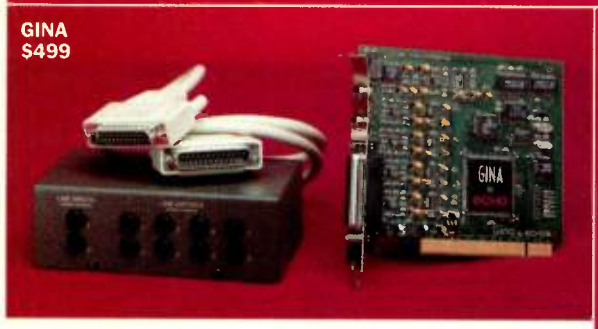
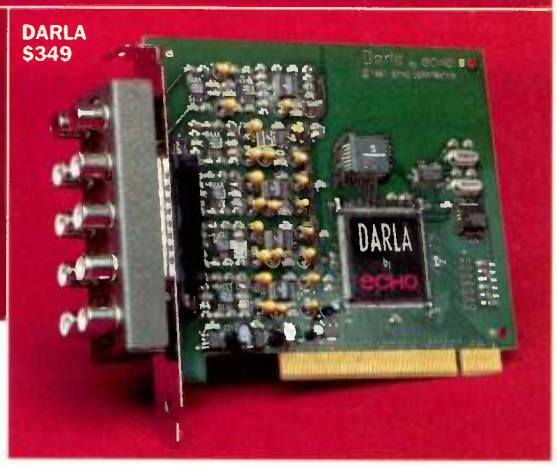
...the EVENT you've been







Affordable Digital Recording Hardware

Introducing our new family of cross-platform PCI-based multitrack audio recording systems, designed by digital audio gurus (and Event strategic partner) ECHO Corporation. Our proudest offering: **Layla by ECHO™**, a rack-mount audio interface with eight balanced analog inputs, ten balanced analog outputs (ins and outs are all simultaneously accessible), digital I/O, a 24-bit signal path, massive on-board DSP, word clock (for sync and expansion), MIDI, and much, much more—all for an amazingly low $999.

Or meet **Gina by ECHO™**: two analog inputs and eight analog outputs (all 20-bit, of course), digital I/O, and on-board 24-bit DSP. Appreciate clean design? So do we. That's why all of the audio connections on *Gina* are pro-quality 1/4" jacks mounted in a rugged breakout box. Appreciate reasonable pricing? *Gina*'s $499 tag is sure to make you smile.

If you only need two analog inputs and eight analog outputs (again, all 20-bit!), on-board DSP, and a breakout box loaded with RCA audio connectors, then say hello to **Darla by ECHO™**—priced to fit just about anyone's budget at only $349. (No, that's not a misprint.)

All three systems are compatible with audio recording and editing software applications that "talk" to the Microsoft Windows 95 .WAV device driver—which means you don't have to give up your favorite software in order to take advantage of the fantastic sound quality that Layla, Gina, and Darla offer. You can, for example (with full apologies to all of the fine software programs we're unintentionally leaving out), run Cakewalk Software's Cakewalk Pro Audio™. Or Steinberg's Cubase Audio™ and WaveLab™. Or Emagic's Logic Audio™. Or Innovative Quality Software's SAW Plus™. Or Sonic Foundry's Sound Forge™. Or Syntrillium Software's Cool Edit Pro™. (In fact, a custom version of Cool Edit Pro comes with each Layla, Gina, and Darla system, so you can be up and running even if you don't already own multi-track recording software.)

Plug-ins? You bet. Including perennial favorites from Waves and Arboretum Systems.

And since getting up and running is half the battle (a battle we firmly believe you shouldn't have to fight) all three systems are true Plug-and-Play™ compliant. We even give you a utilities disk that examines your system before installation, so you know exactly what performance you'll be able to achieve.

Don't worry. We haven't forgotten our Mac-based friends. Our PowerPC-compatible systems (same hardware, new drivers) are coming this summer. Prepare to be stunned.

Precision Monitoring Systems

Building on the technological innovations that arose from the 20/20*bas* development, our intrepid engineers, Frank Kelly and Walter Dick, set out to create an active monitoring system that would be a perfect complement to the digital audio workstation environment. Requirements: small footprint, reference-quality frequency response, non-fatiguing to the ears over long periods of use, magnetically shielded, and *way* cool looks (!). The result: the **Tria™ Triamplified Workstation Monitoring System**. This integrated three-piece system comprises a floor-mounted VLF (Very Low Frequency) driver housed in a station that is also home to five separate power amplifiers, active crossovers, and a full set of calibrated trim and level controls, plus

RØDE™ NT1

Large Diaphragm Condenser Microphone

Hot on the heels of the awesomely successful NT2 comes the **NT1**, a true large diaphragm condenser microphone. Like its predecessor, the NT1 boasts low-noise transformerless FET circuitry, and features the highest quality components. With a 1" gold-sputtered diaphragm inside a proprietary shock-mounting system, a unique head design that provides both durability and pop filtering (while remaining acoustically transparent), and a wide dynamic range that makes the mic ideal for use in a wide variety of applications, the NT1 is destined to become a fixture in the modern project and professional studio. And at only $499, it's just plain scary.

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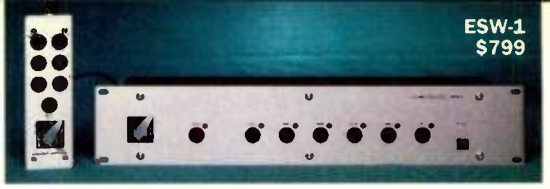
waiting for.



two biamplified satellite speakers, each with a 5-1/4" polypropylene cone driver and 1" neodymium soft dome high frequency driver.

What's truly remarkable is that the biamplified satellite speakers reproduce frequencies down to an incredible 55Hz, so the listener experiences full-range sound when positioned in the direct field (that is, sitting in front of a computer screen). With the addition of the VLF station, the system response reaches down to 35Hz, resulting in full bandwidth audio reproduction that is as accurate, precise, and pleasing to the ear as our award-winning 20/20*bas* system. You simply must hear **Tria** to believe it. Even then, you may not believe the price: $849. (Yes, that's for the *entire* system.)

The **20/20*p***™ is a direct field monitor designed to provide an affordable pathway into the world of powered speakers. Utilizing the proven 20/20 design, the system comprises a 20/20 cabinet with two full-range 100 watt power amplifiers—one of the amps drives the powered cabinet, the other drives a passive 20/20 satellite. The resulting sonic clarity is exactly what you'd expect from a system bearing the 20/20 name: extended low frequency response, exceptionally clear midrange, and sparkling high end. What does this kind of audio quality cost? A low, low $599 per pair.

As with all of our active monitoring systems, the **Tria** and **20/20*p*** offer continuously variable high and low frequency trim controls, input gain controls, balanced inputs with gold combination 1/4"/XLR connectors, and full magnetic shielding.

ESW-1 Speaker Switcher

Bet you were almost going to pass over this part. After all, a speaker switcher isn't exactly the most exciting product in the world. But the **ESW-1™ Speaker Switcher** delivers breakthrough performance and functionality, thanks to the clever engineering of Peter Madnick, who has long been a fixture in high-end audio equipment design. (He's actually pretty scary, possessing serious chops in both the analog and digital domains.)

What makes the ESW-1 unique among switchers is its ability to simultaneously handle both active and passive monitoring systems. Of the six pairs of speakers that can be connected, up to three sets can be active. Switching among them is as easy as pressing a front-panel button. Or use the included remote control so you never have to leave the sweet spot when switching. Naturally, the audio path is beautifully transparent and the switching noiseless. There is one thing about the ESW-1 that we haven't quite figured out: If you own a pair of Event monitors, why would you have any other speakers that you needed to switch to?

EMP-1 Microphone Preamplifier

What better to complement a RØDE Classic, NT2, or NT1, than a custom microphone preamp that combines superior sonic performance with the features demanded by today's studio professionals? (Okay, we admit the thing sounds pretty amazing with other brands of mics as well.) First off, you should know that the **EMP-1™ Microphone Preamplifier** was designed by engineering wizard Peter Madnick. Why is that important? Because, in Peter's own inimitable words, it means that the unit features a transformerless design utilizing a common-mode choke input *[translation: RF interference is virtually eliminated]*, a superior differential input *amplifier [translation: EM interference is suppressed]*, and servo control to maintain zero DC offset *[translation: There are no distortion-inducing capacitors]*. Ahem. Thank you for those fascinating explanations, Peter.

Put in terms the rest of might have a chance relating to: The EMP-1 offers ultra low noise operation, selectable phase, low cut filtering, phantom power, a line output (for running directly into *Layla*, perhaps?), and an internal power supply—all in a downright sexy little box. Now, what does all that mean? It means that the EMP-1 is a mic pre worthy of your finest microphones. (Don't let its low $299 price tag fool you. This preamp is the real thing.)

EVENT ELECTRONICS

We're Event Electronics. Thanks for taking the time to see what we're about. We hope you like what we're doing; please let us know. We'd love to hear from you.

For more detailed information on any of our products—and for amusing photos of prominent members of our industry caught in embarrassing situations—visit our Web site, **www.event1.com.** Or e-mail us directly at **info@event1.com.** Literature on specific products may be obtained by calling **805-566-7777, ext. 555.**

Specifications and features are subject to change.

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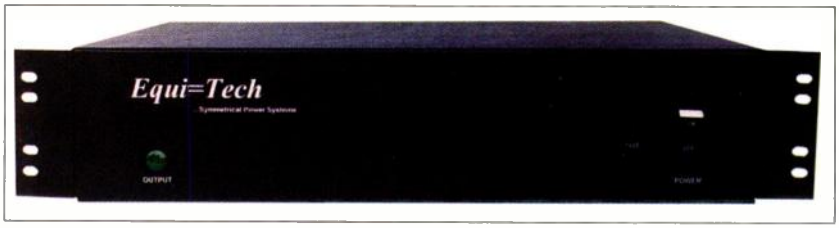
EQ PRODUCT VIEWS

EQUI=ABLE

Equi=Tech has announced the $879 ET1R rackmount Balanced Power AC Systems. The ET1R can be used in many applications, including project studios, postproduction, sound reinforcement, and audio recording. The ET1R is a two-rack-space, lightweight unit with ten outlets handling a total capacity of 1000 watts. For more information, contact Equi=Tech, P.O. Box 249, Selma, OR 97538. Tel: 541-597-4448. Circle EQ free lit. #101.



BOARD MEMBER

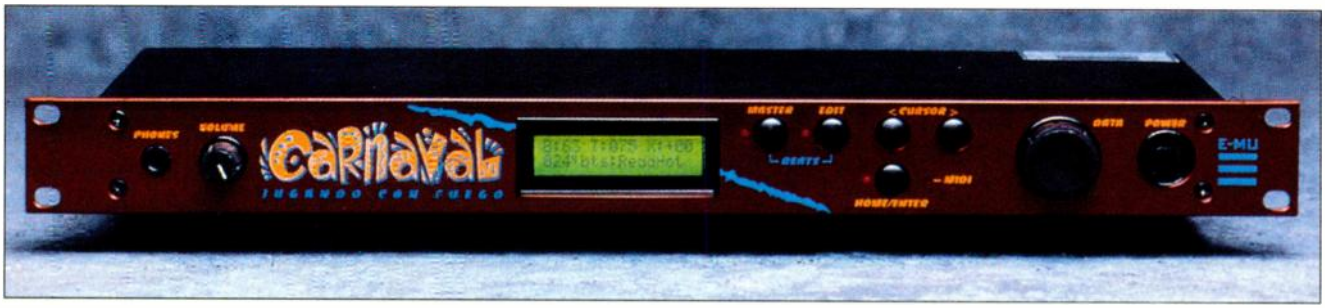
Yamaha has launched another new mixer: the 4-bus MX12/4. The new board features 12 inputs with peak indicators, eight of which are mono with balanced XLR-type microphone inputs and 1/4-inch TRS jacks for balanced and unbalanced inputs. The other inputs are configured as stereo channels, with 1/4-inch TS connectors to accept 2-channel sources. All of the XLR inputs have 48-volt phantom power. Other features include 3-band EQ on all inputs, independent monitor and effect send controls on each channel, and a 7-band stereo graphic equalizer. The mixer also includes a Yamaha built-in DSP. Optional brackets allow the unit to be rackmounted. MSRP is $599.95. For more information, contact Yamaha Corp. of America, Professional Audio Products Dept., P.O. Box 6600, Buena Park, CA 90622-6600. Tel: 714-522-9011. Web: www.yamaha.com. Circle EQ free lit. #102.

NO MORE V-EIGHT PUNS

Studios that favor the ADAT format will be excited to learn that Studer has just introduced the V-Eight, an ADAT-compatible, S-VHS-based tape machine. The V-Eight is an eight-channel digital audio recorder that can record 20-bit words (ADAT Type II), but still maintains full compatibility with the existing 16-bit ADAT format. Built into the V-Eight is a chase synchronizer that allows chase-lock to all standard SMPTE timecode formats; clock sources can also be internal, video reference, word clock, ADAT optical, or SMPTE timecode. Some of the features of the V-Eight include back-lit function keys, headroom to +24 dB and a die-cast chassis. The transport of the V-Eight is based upon three independent DC motors for fast access and reliable operation. A built-in headphone output with individually adjustable levels for each track provides on-board monitoring without need for an external mixer. For more information contact Studer at 41 (0) 1 870 75 11. Circle EQ free lit. #103.

CARNAVAL TIME

E-mu has added a new sound module to its existing line. Dubbed Carnaval, it provides a large palette of authentic and traditional instruments as well as Latin rhythmic loops. Carnaval is 16-part multitimbral, featuring 32 notes of polyphony and 640 presets. Also included is E-mu's BEATS mode, which features 100 drum loops that can be synchronized to their own internal clock or an external MIDI clock. There are 28 user songs and 28 factory songs available. Each user song can have 10 events linking beats together. Both songs and beats can be accessed from the front panel or remotely by using MIDI Song Start/Stop and Song Select commands. The BEATS mode also lets the user transpose the entire beat in order to create new grooves based around a single drum loop. For more information, contact E-mu, 1600 Green Hills Rd., Suite 101, Scotts Valley, CA 95067-0015. Tel: 408-438-1921. Web: www.emu.com. Circle EQ free lit. #104.



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THIS IS ONLY A TEST

When a problem arises in your studio, do you ever wonder if the actual unit is at fault, or if it is only a faulty wire? Wonder no longer with the CableCheck from SoundTech. With its 11 LED indicators, the CableCheck clearly shows the nature of any cable problem, including inverted pins, conductor-to-conductor shorts, conductor-to-shield shorts, and open connections. Inputs include BNC, RCA phono, 1/4-inch phone (stereo and mono), 1/8-inch phone (stereo and mono), MIDI (DIN-5), XLR, and Speakon (4-pole). CableCheck is also ready for a road trip with its all-steel chassis and 9-volt alkaline battery power. Price is $149.90. For more details, contact SoundTech, 255 Corporate Woods Parkway, Vernon Hills, IL 60061. Tel: 847-913-5511. E-mail: prosound@juno.com. Circle EQ free lit. #105.

KEEP ON WRITIN' ON

Ricoh Corporation's Disc Media & Systems Products division has debuted the MP6200S, the first CD-R/CD-RW (rewritable) drive to have rewritable capability and a SCSI-2 interface. When used as a CD-R drive, the finished CD-Rs are compatible with existing CD-ROM players. Recorded CD-RW media has backward compatibility with multi-read enabled CD-ROM drives and forward compatibility with DVD players. The MP6200S use both standard CD-R media and CD-RW media that can be recorded up to 1000 times. The MP6200S can record a full CD-R or CD-RW disc in 37 minutes (2X write). It can read at up to 6X speed. Price is $599 for an internal drive. For more information, contact Ricoh, 3001 Orchard Parkway, San Jose, CA 95134-2088. Tel: 408-432-8800. Circle EQ free lit. #106.

MORE FRANKFURT NEWS

Submitted by Craig Anderton

Akai's Reply...Akai has thrown its hat into the personal hard-disk recording studio arena: the DPS 12 (Digital Personal Studio) allows a maximum of 12 tracks and can record 6 tracks at once. It uses 16-bit linear recording with no data compression, and includes a digital mixer with MIDI automation. There's built-in EQ; an FX board is optional. I/O includes S/PDIF, two RCA aux sends, RCA stereo out, six 1/4-inch phone jack inputs, MIDI in/out, and SCSI port. Prices are not yet set, but two versions are expected: one with a built-in drive for around $1600, and one with a cartridge drive for around $2000. Akai, 817-336-5114.

Korg's Signal Processors...The **DLR2000** digital multitap delay provides pre-delay times up to 400 ms and stereo delays of up to 4.8 seconds, with four taps (plus feedback) per channel; programs (128 user and 20 factory) switch seamlessly. The **AMR2000** ambience multieffects processor is similar, but replaces multitap delay with a variety of effects — delay, echo, reverb, pitch shift, ring modulation, rotary speaker simulator, etc.

Also new: the **Pandora PX2,** an updated Pandora "personal processor" with additional practice features such as 32 rhythm loops in various styles, center cancel function for removing many vocals and guitar solos from external program material, and a transpose option for changing the pitch of the song you're jamming with. There's also a new cabinet simulator algorithm, backlit display with icon-driven interface, and 38 new programs. Korg, 516-333-9100.

Multitrack MiniDisc Evolution...**Yamaha's MD4** MiniDisc 4-track recorder can now use all 2-track and mono functions when recording onto standard audio MiniDiscs; loading a recordable audio MD into the MD4 automatically selects 2-track recording mode. Furthermore, stereo MiniDiscs recorded on the MD4 can play back on a normal MiniDisc deck, and the MD4 can edit recordable audio MiniDiscs (except for songs copied digitally from a commercial CD, due to SCMS copy protection). Yamaha, 714-522-9011.

Another PCI Sound Card...The **PCI 24 Bit Mastering Card from SoundPool** is a S/PDIF interface for Mac and PC computers with coaxial and optical I/O. The Windows 95 drivers are compatible with Steinberg's WaveLab sample editing software. SoundPool, 011-49-7046-90215.

Rocktron Makes a Pitch...Thanks to algorithms from Wave Mechanics, the **Intellipitch** provides accurate, natural pitch shifting (as well as reverb, delay, and chorus) for under $1500. Also new: the **Velocity Valve** stereo power amp, designed by amp guru Bruce Egnater — 90 watts per channel and priced under $1800. Rocktron, 810-853-3055.

EH Pushes the Envelope (Follower)...The **Q Tron,** also known as Doctor Q Deluxe (list price under $250), is a reissue of the original Mutron envelope follower (including the opto-isolator technology) but with an additional normal/boost switch for adding gain. Electro-Harmonix, 212-529-0466.

Fender's PA System-As-Luggage...Weighing in at 53 lbs. and measuring 24" H X 33" W X 12" D, the **Passport** self-contained PA system is about the size of a piece of luggage. Features include 250 W stereo power amp, four mono mic/line inputs, two stereo inputs, digital reverb, four 6.5-inch speakers per enclosure (free-standing or tripod-mountable), EQ, and ducking (music is lowered when someone speaks into a mic). It comes complete with two mics, two mic cables, and speaker cables. Passport works on any AC voltage worldwide, as well as 12 V DC. Fender, 602-596-9690.

Blue Chip's New Guitar Synth...The **Axon AX 100** is Blue Chip's next-generation, guitar/bass converter that accepts both magnetic and piezo-electric pickups. It allows for split by string, fret, and picking position, as well as pick-position modulation, arpeggiation, and a mono input for voice and wind-to-MIDI conversion. The Axon 100-SB includes a GM tone module with 480 presets, 11 drum kits, reverb, chorus, and other effects. Distributed in the USA by MIC, 516-352-4110.

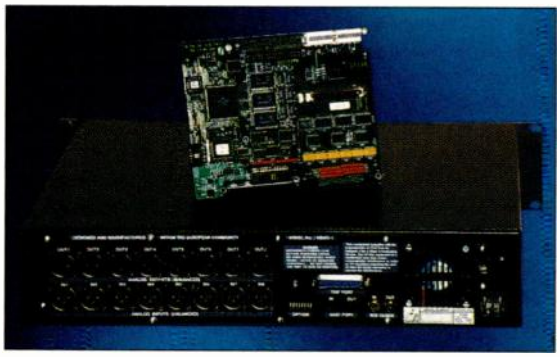
Oberheim Meets Viscount...Oberheim has joined with the Italian company Viscount for three product introductions. The two-rack-space **GM-1000 Digital Guitar/Bass Processor** has the usual effects (compressor, expander, distortion, parametric and graphic EQ, chorus/flanger/phase/tremolo, amp simulator, delay, reverb, etc.) as well as some bonuses: ring modulation, arpeggiator, pitch shifter, "smart" noise reduction, delay time sync to MIDI clocks, tuner, and spectrum analyzer. Nine effects are available simultaneously; there are four banks of 128 programs, simultaneous XLR and 1/4-inch stereo audio I/O, two merged MIDI ins, and MIDI out with two MIDI thrus. The **GM-400** is a scaled-down, single-rack-space version with fewer effects and a smaller display. Finally, the **MiniGrand 64-Voice Digital Piano Expander** has

continued on page 20

World Radio History

EQ STUDIO WARE

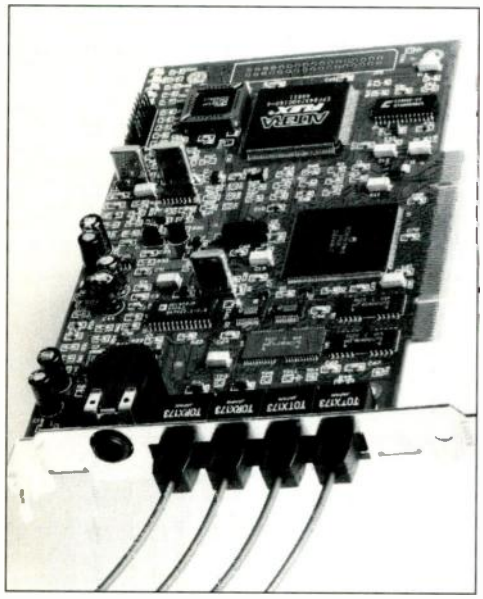
WORKING CARD



Soundscape continues to develop and upgrade its SSHDR1 hard-disk recording system with the SSAC1 expansion board. The plug-in DSP card is retro-fittable with all existing Soundscape systems, and adds several times the audio processing power of the existing system while adding eight channels of I/O in the form of a TDIF port. A Soundscape system that has been updated with the SSAC1 will have a total of 10 inputs and 12 outputs (eight via TDIF, plus the 2-in, 4-out standard configuration). For more details, contact Soundscape, 705A Lakefield Rd., Westlake Village, CA 91361. Tel: 805-495-7375. Circle EQ free lit. #109.

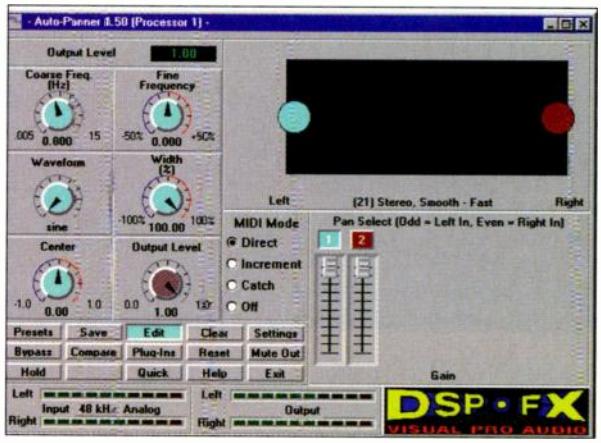
SWEET SIXTEEN

STUDI/O from Sonorus is a 16-channel digital audio interface for Windows 95-based PCI computers that retails for $989. The interface will allow users to input/output 16 channels of audio in parallel from the



PC to a pair of Alesis ADATs (including Meridian) using standard fiberoptic cables. The supplied software drivers are compatible with existing Windows audio devices, so STUDI/O is compatible with most Windows-based DAW editing software. The interface also includes two 8-channel Alesis ADAT optical interfaces (switchable to S/PDIF for use with DAT machines) and an 18-bit stereo analog monitor output. For more information, contact Sonorus, 111 East 12th St., #2, New York, NY 10003. Tel: 212-253-7700. Web: sonorus.com. Circle EQ free lit. #110.

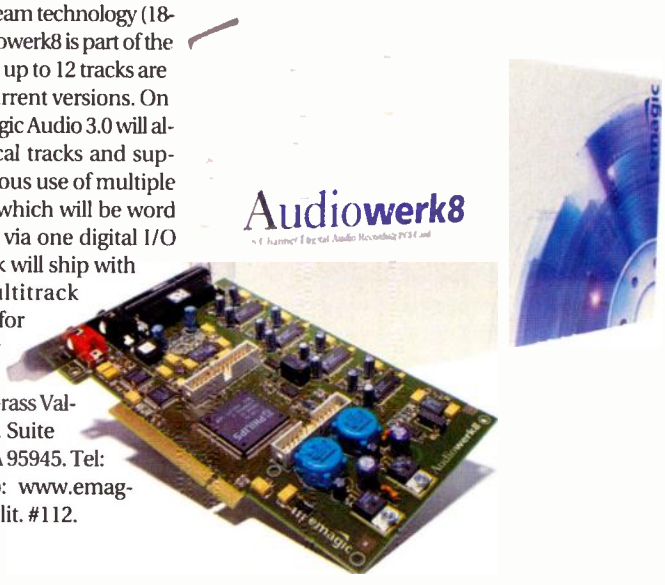
PLUG-IN POWER



Power Technology has recently announced the introduction of the Auto Panner and Tremolo FX•Plug-Ins for the company's DSP•FX system. Both FX•Plug-Ins use Power Technology's animated graphics technology, which, in the case of the Auto Panner, graphically animates the sound source as it moves through the stereo field. Both of the new FX•Plug-Ins will be included in all DSP•FX systems, and are available at no charge for current owners. For more information, contact Power Technology, 100 Northill Dr., Bldg. #24, Brisbane, CA 94005. Tel: 415-467-7886. Web: www.dspfx.com. Circle EQ free lit. #111.

WERK IT OUT

Emagic's Audiowerk8 recording card turns your PC or Macintosh into a digital audio workstation. The Audiowerk8 is a PCI recording card with two analog inputs, eight individual outputs, and stereo digital I/O (S/PDIF). Audiowerk's A/D and D/A converters feature bitstream technology (18-bit equivalent). Audiowerk8 is part of the Logic Audio System; up to 12 tracks are possible with the current versions. On the software side, Logic Audio 3.0 will allow up to 24 physical tracks and supports the simultaneous use of multiple Audiowerk8 cards, which will be word clock synchronized via one digital I/O per card. Audiowerk will ship with VMR (Virtual Multitrack Recorder) software for a price of $799. For more details, contact Emagic, 13348 Grass Valley Ave., Building C, Suite 100, Grass Valley, CA 95945. Tel: 916-477-1051. Web: www.emagic.de. Circle EQ free lit. #112.



World Radio History

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EQ STUDIO WARE

AMERICAN HOTZ TRAX

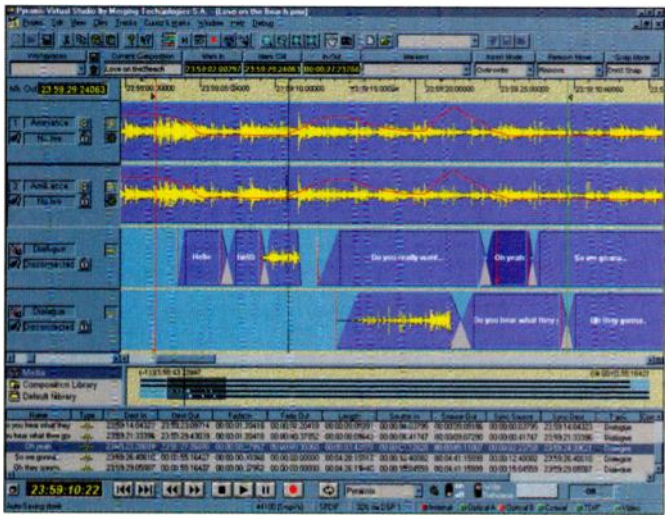
Hotz Trax converts a standard multimedia PC keyboard (or any MIDI controller connected to the computer) into a musical instrument. Hotz technology ensures that the song's scale and chord structire is mapped to the computer keyboard. Hotz Trax includes 25 MIDI-compatible Hotz Files. Saved files can be sent online for a collaborative, interactive musical experience with other cyber-musicians. A CD-ROM and Internet delivery of Hotz Trax is available for an introductory price of $49.95 on the Hotz Interactive Web site. Minimum system requirements include a 66 MHz 486 PC, 8 MB of RAM, CD-ROM drive, FM or wavetable sound card, and Windows 3.1 or 95. For more details, contact Hotz Interactive, 30343 Canwood St., Suite 206, Agoura Hills, CA 91301. Tel: 818-735-5710 or 888-774-TRAX. Web: www.hotz.com. Circle EQ free lit. #113.

WARM BITS

Add a little warmth to your hard-disk system with DUY's DaD Tape plug-in analog tape simulator. DaD Tape allows the simulation of four tape recorders: a vintage machine with tube circuitry, transistor-based machine of the late '60s, an operational-amplifier-based machine of the '70s, and a machine from the current generation. DaD Tape simulates the most common noise reduction systems and also a proprietary noiseless-tape mode. Switchable tape speeds are also included (7 1/2 ips–15 ips-30 ips). DaD Tape is currently available for Digidesign TDM Bus, Sound Designer II, and Pro Tools 4.0 with automation. For more details, contact DUY, Pl. Lesseps, 33, 08023 Barcelona, Spain. Tel: 93-2174510. Web: www.duy.es. E-mail: info@duy.es. Circle EQ free lit. #114.

CAKE FOR COMPUTERS

Cakewalk Pro Audio turns 6.0 with the release of the newest version of its software. Enhancements over previous versions of the software include improved audio processing effects, seamless integration with third-party audio plug-ins, and the addition of Cakewalk StudioWare, which allows users to design custom interfaces within the Cakewalk application to control a variety of studio hardware. Cakewalk 6.0 is also the first music creation package to support Microsoft's DirectX open standard for streaming audio and video media. Other new features include controller data viewed from within Piano Roll window; percussion notation; improved tools for pattern-based sequencing; real-time display of notes while recording; save/recall multiple screen layouts; drop markers on the fly; and support for 48 kHz audio. For more details, contact Cakewalk Music Software, 44 Pleasant St., Watertown, MA 02272. Circle EQ free lit. #115.



PYRAMIX SCHEME

Merging Technologies has debuted Version 1.2 of its Pyramix Virtual Studio. New additions to the software include an AudioExpress feature that adds workgroup functionality by letting users send and receive e-mail directly within Pyramix. Also in Version 1.2, you can punch in/out recording directly to the EDL. For storage purposes, the new version of Pyramix offers Lossless Realtime Compression (LRC) with its nondestructive storage and retrieval of audio at rates of 2:1 and above, both locally and on server volumes. AudioExpress e-mail allows users to attach audio clips, mixer settings, effects settings, etc. into the e-mail messages. Pyramix Virtual Studio is compatible with Windows 95 and Windows NT 4.0 operating systems. For more information, contact Merging Technologies, 16835 West Bernardo Dr., Suite 101, San Diego, CA 92127. Tel: 619-675-9703. Web: www.merging.com. Circle EQ free lit. #116.

World Radio History

Do You Want The Original, A Copy Of The Original, Or Something Clearly Better?

MX12/4 High quality, medium quality and low quality mixers have a lot in common these days. They look alike and so do their ads. Success breeds imitators.

The look and the ad are easy to copy. Lots of our competitors are proving that everyday. Look around in this magazine and you'll see some disturbing similarities.

Yamaha has been among the most successful mixer manufacturers for years. We've had a lot of imitators through the years ourselves. It's hard to know which one to buy without looking inside. Remember, they all look alike and they're all trying to act alike.

But take heart. There are some differences you can hang your hat on. Look for the name Yamaha. Even if you don't know mixers, you know Yamaha is known for being "clearly better" in all we do.

If you do know mixers, you know that Yamaha supplies the largest touring sound companies with their world famous PM Series mixing consoles. The most demanding sound engineers in the world demand Yamaha's large PM consoles more than any other. Does this help us do small mixers better? You bet it does.

In the case of the new Yamaha MX 12/4, if you look closely, you can see some innovations that will save you money and make you look and sound better. Clearly better.

- $599.95 Suggested retail price
- 14 Inputs with 4 "real" buses at the other guy's 2 bus price range (After you buy your mixer, you'll have to buy a reverb and a graphic EQ, unless you bought something clearly better; The Yamaha MX 12/4.)
- An on-board digital reverb (No extra charge. Yamaha is world famous for its DSP technology.)
- An on-board 7-band graphic EQ (Again, no extra charge.)
- No Radio

When you cut corners you might get more than you bargained for. Like radio. Designing mixers with solid RF rejection is not easy. It's one of those "inside things" you can't see. We've been dealing with the most demanding customers in the world using mixers in the most demanding environments. We do it better than anyone.

If you're in the market for a 12x4x2 mixer and you can accept better quality and value than you expected for the money, the new Yamaha MX 12/4 offers you a clearly better choice.

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CIRCLE 94 ON FREE INFO CARD

World Radio History

THERE'S NO

The MiniDisc format has created a recording revolution. TASCAM's 564 makes the most of it to give you more creative power than any other MD multitrack available. It's the only MiniDisc multitrack system built with TASCAM's recording experience and reliability.

The TASCAM 564 Digital Portastudio®

Built for serious musicians who get inspired by great performance, the 564 is a complete 4-track digital studio with features that other MD multitracks can't match or simply don't have. The 564 complements your creativity with the intuitive operation, ease of use, and durability you expect from the inventors of the Portastudio — TASCAM.

You're gonna love the 564's jog/shuttle wheel

Hear the difference! Only the 564 gives you audible, frame accurate jogging, cueing and index trimming. The others leave you guessing. Plus you can shuttle at 2, 8, 16, or 32 times normal play speed. Call up system parameters and alter values, even MOVE, ERASE and COPY with one hand tied behind your back.

Killer arrangements with exclusive Index Programming

Only the 564 lets you segment your song into as many as 20 patterns. And only the 564 has the hot new Index Program feature that lets you rearrange those patterns with as many as 99 steps for tremendous flexibility. Half the intro, double the chorus, or construct a whole new arrangement without losing the original — even after you power down.

The best mixer section in a MiniDisc Multitrack

It's all here; high quality mic preamps, responsive faders and pots, 3-band EQ with mid sweep, 2 Aux Sends and more. The routing flexibility makes it incredibly easy to Bounce Forward, overdub, monitor, even transfer tracks to another machine for sweetening. All this and only on the 564 Digital Portastudio.

5 takes per track. Only from TASCAM!

Imagine the perfect solo. Only the 564 gives you five takes per track to create it. With Auto Punch you can set frame accurate punch-in and out points, even do hands-free punches! To rehearse, just repeat between any two index markers for continuous playback. Only the 564 lets you choose from 0 to 9.9 seconds between repeats. You've got the licks. The 564 helps you make the most of them.

World Radio History

COMPARISON.

Instant gratification. It's the fastest!

The 564 leaves other MD multitracks in the dust. It's so fast, it doesn't even need a pause button. With the only transport exclusively designed for digital multitrack recording, it continuously loads data for lightning-fast index trimming and song arranging, plus smooth multiple-speed shuttling capability.

Flex your creativity with non-destructive editing

With the 564, you'll never lose your inspiration. You can always UNDO or REDO the previous edit with the touch of a button. Ping pong, overdub, or create multiple mixes of your song on a re-recordable disc you can stick in your pocket. The 564 even reminds you to save your original tracks. It's a complete digital project studio you can carry under your arm. And it's from the inventors of the original Portastudio.

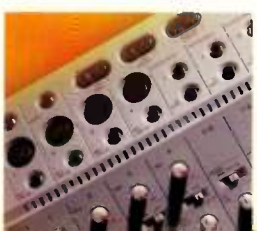
There's only one digital Portastudio.

All MD multitracks are not created equal. So don't buy a TASCAM wannabe. You'll end up with a lot less than you bargained for. Get the 564 Digital Portastudio from TASCAM and get the best. For the whole story, dial TASCAM FaxBack at (800) 827-2268 and request document #8320.

TASCAM FAX-BACK 1-800-827-2268
Document #8320

Bounce Forward only from TASCAM. It's incredible!

The 564's exclusive one-step Bounce Forward feature creates a stereo submix of your four tracks to the next song location on the disc with all EQ, panning and effects processing intact. Now you have 2 more tracks for overdubs. Overdub and Bounce Forward again and again until the music is just right. Even create a studio quality final mix — all within the 564!



Ins and Outs: XLRs, MIDI and Digital

4 XLR ins. 4 mono ins. 4 stereo ins. Simultaneous use of 2 AUX sends. 2 insert points. 2-Track in. Up to 4 additional live inputs at mixdown with the exclusive Buss Direct System. Sync to your sequencer without wasting an audio track for Time Code. And the only MD multitrack that lets you digitally transfer your mix to DAT or CD-R via S/PDIF? You guessed it — the 564!

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Take advantage of our experience.

Manufacturer's Suggested Retail Price is $1,499.

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CIRCLE 65 ON FREE INFO CARD

World Radio History

Tesh & Go

John Tesh's trailer-based project studio proves he's serious about sound

STUDIO NAME: Look At The Lights
LOCATION: Beverly Hills,CA
KEY CREW: John Tesh; Ross Pallone; Chris Chandler; Steve "Shorty" Cades
PROJECTS RECORDED: John Tesh, *Avalon* (recorded and mixed), *Live From Avalon* PBS special (mixed), and *Guitarmasters* (mixed; yet to be released).
CREW CREDITS: In addition to working on Prince's *Controversy* and serving as John Tesh's studio engineer for the past ten years, Ross Pallone mixes front of house for Tesh live. He has also mixed FOH for Michael McDonald and James Newton Howard.

Chris Chandler works exclusively for Tesh and moonlights as a guitar player for the band Ferdinand.

Steve "Shorty" Cades has worked on NBC's "Tonight Show," Natalie Cole's Unforgettable Tour, and with Bill Graham Productions.

CONSOLE: Euphonix CS2000 (96 inputs total) with eight channels of dynamics
KEYBOARDS AND SAMPLERS: Kurzweil K2500 and K2000 [2], SX-, GX-, PX-, and HX1000 modules; Roland JV1080, JV880, MKS80, and D50; Korg Wavestation AD, M1, and M1REX [2]; Prophet VS (one rack, one keyboard), Prophet 5, Hammond XB-2, Voce MIDI organ module; E-mu Proteus 1 [2], Proteus 2 [2], Emulator II, and Proformance; Synclavier; Yamaha PF150 and PF300 Clavinova (generally used for touring)
MONITORS: Genelec 1031A, 1030A
COMPUTERS & SOFTWARE: MOTU Performer 5; Mac IIfx; MOTU MIDI TimePiece 2 interface
RECORDERS: Sony 3324A; Otari Radar; Pro Tools (eight tracks); Marantz 610 CD recorder; Nakamichi MR-1 cassette
DAT MACHINES: Panasonic SV-3700 [2]
OUTBOARD GEAR: Summit EQF-100 (parametric) and EQP-200 (program) equalizers; TC Electronic M5000 (dual-engine), M2000 effect processor [2], 1210 chorus/flanger; Yamaha SPX900 and Rev 7; Lexicon PCM70, PCM 41, and Prime Time delays; Demeter VTMP-2a tube mic preamp [2]; dbx 160x compressors [6], UREI 1176 limiters [2]; Behringer Denoisers [2]
MICROPHONES: Neumann TLM170 [3] and U87; AKG C414 [2], C452 [3], D112, and C409 (miniature condenser); Shure SM57 and Beta 58; Countryman direct boxes [6]; Demeter Tube DIs (rack mount) [2]
STUDIO NOTES: Chief engineer Pallone notes: Chris Pelonis of Pelonis Sounds and Acoustics did the design and installation for Look At The Lights. The studio is built into sort of a prefabricated trailer that sits behind John's house. It's long and narrow, and when you walk inside, it might remind you of a remote recording truck. When you sit behind the console, the room sounds great, but as you move toward the rear of the room, the sound becomes more boomy. Chris compensated for this by building "The Edge," which is a rather large wedge-shaped box, tuned internally with various materials. This helped to smooth out the room response and tune the room for proper acoustics.
EQUIPMENT NOTES: John Tesh states: I have had a home studio since I was in an

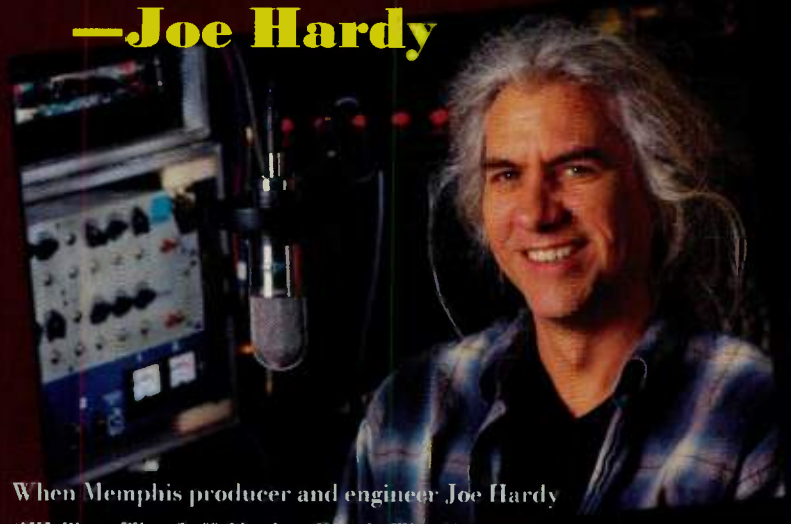
continued on page 130

PHOTO BY RICHARD E. AARON

World Radio History

"An indispensable tool for digital recording..."

—Joe Hardy



When Memphis producer and engineer Joe Hardy (ZZ Top, The Jeff Healey Band, The Radiators, etc.) is working to capture an artist's unique sound, he relies on the Peavey PVM™ T9000 condenser tube microphone. With its self-polarized condenser capsule and vacuum tube preamp, the PVM T9000 mic gives him the mellow warmth that can only come from a tube.

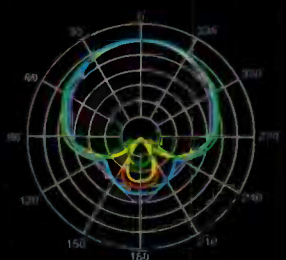
The uniform cardioid polar pattern makes it perfect for studio vocals, and because it easily handles SPLs up to 137 dB, Joe can count on it when high SPL instrument applications are required.

The PVM T9000 also includes a 10 dB attenuator and 80 Hz low-cut filter switches to control the variables that could hex an otherwise good session.

To complete the package, the system comes with shockmount/heat-sink, special cable and power supply.

The PVM T9000 tube microphone from Peavey Audio Media Research. Trusted by the best!

PVM™ T9000



PEAVEY
Audio Media Research

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CIRCLE 40 ON FREE INFO CARD

Western Electric 618A

A high-end mic for its day, this rugged model has stood the test of time

PHOTO BY EDWARD COLVER

MICROPHONE NAME: Western Electric 618A
FROM THE COLLECTION OF: Bob Morrison/Standard Microphone Laboratory
PRICE WHEN NEW: Under $100 (circa 1932)
TYPE OF MIC: Dynamic moving coil
POLAR PATTERN: Nondirectional
FREQUENCY RESPONSE: 35 Hz to 10,000 Hz
EFFICIENCY: From the brochure: "For a person speaking with normal conversational intensity at a distance of 3 feet from the microphone, an output level of –84 dB relative to a zero level of 6 milliwatts is representative."
RATED SOURCE IMPEDANCE: 30 ohms (see notes below)
DIMENSIONS: 3.25 inches (diameter) x 3 inches (depth)
WEIGHT: 2.5 pounds
MIC NOTES: Intended for radio broadcasting, sound recording, and public address systems, the Western Electric 618A was designed to provide high fidelity, inherent quietness, mechanical ruggedness, and stability under changing barometric pressure and temperature conditions. There were actually two versions of the 618A available: the 618A-3, which had a black lacquer finish, and the 618A-13, which had a bronze lacquer finish. Output impedance of the 618A was extremely low and actually varied a bit — from 28 ohms in the low-frequency region up to about 38 ohms at 10,000 Hz. Due to this electrical characteristic, the 618A could be interfaced with a preliminary amplifier called the 80A (also available from Western Electric) that provided 31 dB of gain and a selectable output impedance of either 200 or 50 ohms. In subsequent years, the 618A and its Western Electric successors, the models 630 and 633 (which also had impedances of 30 ohms) were often used plugged directly into Western Electric's 23C console.

A high-grade cobalt-steel alloy was used for the 618A's magnet structure, while the diaphragm material was duralumin, clamped around the outer edge and attached to a coil made from aluminum ribbon. *EQ* estimates that cost of the 618A back in 1932 was in the neighborhood of $85. This would make 618A more expensive that comparable mics of its time — but that was typical for Western Electric products. Data quoted above for the mic was taken from Western Electric's Instruction Bulletin No. 637, which did not document technical specifications for the mic in the same manner as we typically do today. EQ

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CIRCLE 44 ON FREE INFO CARD

World Radio History

Frankfurt Report

Some hot new products from Musik Messe that will be heading your way soon

BY CRAIG ANDERTON

CREAMW@RE MEETS...TAPE!

CreamW@re started out with a simple 2-track editor called tripleDAT that has, over the years, mutated into a capable multitrack system with a host of accessories. Its latest project, the TDAT 16, wraps new hardware (a PCI board and optional rack-mount analog interface units) around a variation of the tripleDAT software. The package is designed to interface with 8- or 16-track ADAT setups, thus allowing computer-based recording, arranging, editing, and mixing of both hard disk- and tape-based material.

The TDAT 16 PCI board ($2198) provides onboard signal routing and mixing; it boasts 32-bit operation, two optical I/O connectors switchable between ADAT and S/PDIF, a multimedia compatible driver that works with other Windows multimedia software, stereo sample rate conversion, and mastering-quality stereo analog output.

However, you're not restricted to using ADAT: TDAT 16 can be a general-purpose, 16-track recorder with the addition of the optional rack-mount A8 and A16 modules ($898 and $1298, respectively). These provide 8 or 16 analog, 1/4-inch TRS inputs and outputs, respectively. Each also has an ADAT optical interface, clipping indicators, and word clock sync, so they can replace the converters inside the ADAT if desired.

The software (tripleDAT v. 2.5) allows up to 16 physical and 256 virtual tracks, but also includes a host of real-time DSP effects including compression, EQ, expander, gate, de-esser, delay, etc. Non-real-time effects include pitch shifting and time stretching. Red Book CD writing and DAT data backup are integrated as well.

Finally, tripleDAT now supports the CDF-1 "CD Factory," a SCSI-based peripheral that can write up to 32 CDs in a row. This is ideal for small production runs, and can duplicate data as well as audio CDs. The CDF-1 opens the CD writer's drawer, drops in a blank CD-R, then retrieves it and stores it safely. The mechanism doesn't depend on any one writer, so upgraded CD recording mechanisms could be used in the future.

By the time you add all these system elements together, along with the RAM needed to make the system fly (64 MB seems about right), the cost does add up. However, you do end up with a pretty comprehensive system — especially for ADAT owners. For more details, contact CreamW@re, Sumas, WA. Tel. 604-527-9924. E-mail: hello@creamware.com. Circle EQ free lit. #117.

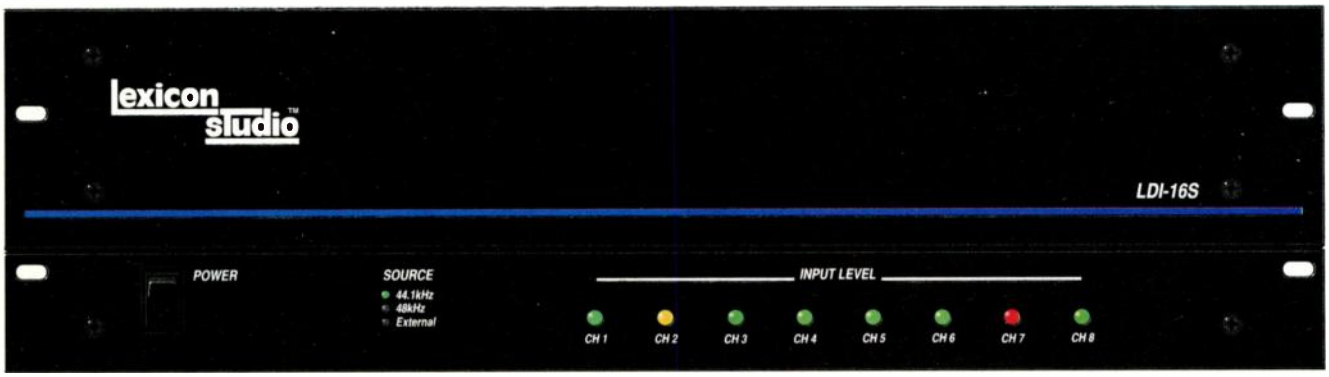
LEXICON'S DESKTOP BOMBSHELL

Lexicon has a new Desktop Products Division, whose mission is to develop high-performance hardware components for computer-based audio production systems. Its first product, the Lexicon Studio System, consists of various rack-mounted hardware components that provide I/O options, DSP, signal routing, and synchronization/control that complement PC/Mac-based industry software packages such as Steinberg's Cubase VST.

The Lexicon Studio System incorporates LexiPowerCore technology (LPC); this accelerates the host computer for maximum audio processing throughput via proprietary disk event optimization, integral Lexicon DSP based on the same engine as the PCM-90, and system routing (signal routing setups can be saved/recalled). The Lexicon Studio will also interface to current digital tape-based systems (including ADAT and Tascam DA-88/38) to allow editing, processing, and assembly of previously recorded material.

The PCI bus-based Core-32, the heart of the system, supports up to 32 simultaneous voices as sources or destinations from the host system, with 24-bit resolution. Regarding synchronization, the Core-32 can be either clock master or clock slave; in addition, the digital clock can be distributed to the rest of the system. An on-board variable rate oscillator provides proper sync to timecode when locking to external sources.

A single Core-32 card can support



LEX GET DIGITAL: Lexicon has introduced a line of products for computer-based audio systems.

World Radio History

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teract; for example, the FM function can use any of the other algorithms as a waveform. Five types of filters (with two filters per voice), and dedicated filter and amplitude envelope generators provide significant sound-shaping control.

For signal processing, there are 15 insertable effects, two types of "master" effects, and overall 2-band EQ. As to goodies, the Z1 has a built-in, polyphonic, syncable 36-step arpeggiator with five preset and 15 programmable patterns, optional ADAT optical interface, and a large graphic display with popup menus. Not only the arpeggiator, but the LFOs are syncable to MIDI clocks. For programming enthusiasts, a Mac editor is included.

Live performance is also taken into account: there are five assignable "performance knobs," and up to four parameters can be ganged per knob. Additionally, there are 14 fixed knobs for altering filter, envelope generator parameters, etc., as well as an X/Y touchpad. The various controllers will produce either MIDI continuous controller data or sys ex, so that performance "moves" can be recorded into a sequencer.

And how does it sound? It's a synthesizer, not a sample playback device, so the sounds have a certain crispness and definition — and the live performance controls really let you get "inside" the various models. Prediction: this is going to be big. The projected price is under $2600, with delivery scheduled for the fall. For more information, contact Korg, 316 S. Service Rd., Melville, NY 11747-3201. Tel: 516-333-9100. Circle EQ free lit. #119.

FOSTEX D-90 AND D-160 HARD DISK RECORDERS

Hard disk recording is hot, and ADATs are hot — so like several other companies, Fostex is making sure that their new machines speak fluent ADAT.

The Fostex D-90 8-track digital multitrack is based on a removable caddy hard-drive system, and records up to eight tracks simultaneously (16-bit, no data compression) to standard IDE drives. It can chase to incoming MTC, with or without external word clock, and includes the ADAT digital "light pipe" interface for hard-disk editing of ADAT tapes or hard-disk backup to ADAT. The Model 8338 SCSI-2 interface provides fast backup and restore to external SCSI drives; the Model 5040 option provides balanced, +4 I/O on two D-sub 25-pin connectors in addition to the unit's stock –10 RCA connectors. Other features include ±6 percent pitch control, 44.1 or 48 kHz sampling frequencies, nine "virtual reels" (each with their own timing, locate points, and sample frequency), cut/copy/paste/

continued on page 151

TALK THAT TALK: Fostex's new hard-disk recorders speak fluent ADAT.

World Radio History

The Logic System:

Logic Audio – The Pros choice. Feature rich 960ppq real-timer Sequencer. Professional Scoring & Printing. Unlimited Virtual Mixers with full automation. Up to 24 tracks of digital audio with intense offline and real-time DSP editing.

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Jim Aikin, Keyboard, March, 1997

In their words, not ours:

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"For both the audio professional and the serious enthusiast who aspire to 'grown-up' Lexicon quality but without the price tag, the MPX 1 really delivers." **Paul White, Sound On Sound Magazine (UK)**

"The MPX 1 boasts more editing power in its Play mode than most processors do at their deepest editing levels... an outstanding choice for live and studio applications." **John Chappell, Guitar Magazine**

"There is more bang-for-the-buck packed into this box than anything Lexicon has ever offered. You have to hear it to believe it." **Steve Read, Gig Magazine**

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World Radio History

Luscious Jackson's "Naked Eye"

EQ talks to band vocalist/bassist Jill Cunniff on the recording of this creative track

BY LIANA JONAS

EQ: The nice thing about this song is the vocal arrangement. How was it formed?
Jill Cunniff: We have a song on our album (*Fever In Fever Out*, Capitol) called "Why Do I Lie?" and it was too wholesome-sounding to me. I wanted it to be something else so I started another track with different music. It eventually became the music to "Naked Eye." I actually have a version of "Why Do I Lie?" sung over the "Naked Eye" music; we'd like to release it when "Why Do I Lie?" becomes a single. So "Why Do I Lie?" maintained its wholesomeness and "Naked Eye" came out of that music. After that, I just started singing over this track; creating the vocals in my house with an ADAT. Using the ADAT really helped me out with the arrangement. For the rest of the album I wrote the vocals with a 4-track. Moving to the ADAT made it so much easier to put together multiple vocal tracks and hear and mix them well. I started with the backing vocals and built the main line over it.

The layering of the vocals is interesting as well.
I sang all the parts. This is what I mean about the benefit of the ADAT. I was able to really create layers. I laid down the main vocal first and then the backing vocals. All of the vocals were then doubled. One of my favorite things to do is experiment with vocals.

How did you achieve that low, resonating bass sound that permeates the entire track?
Our DJ, Alex Young, is really into subbass, and we put an octave pedal on my bass and set it in such a way where it created this rumble. Part of the song also uses a Multivox keyboard bass.

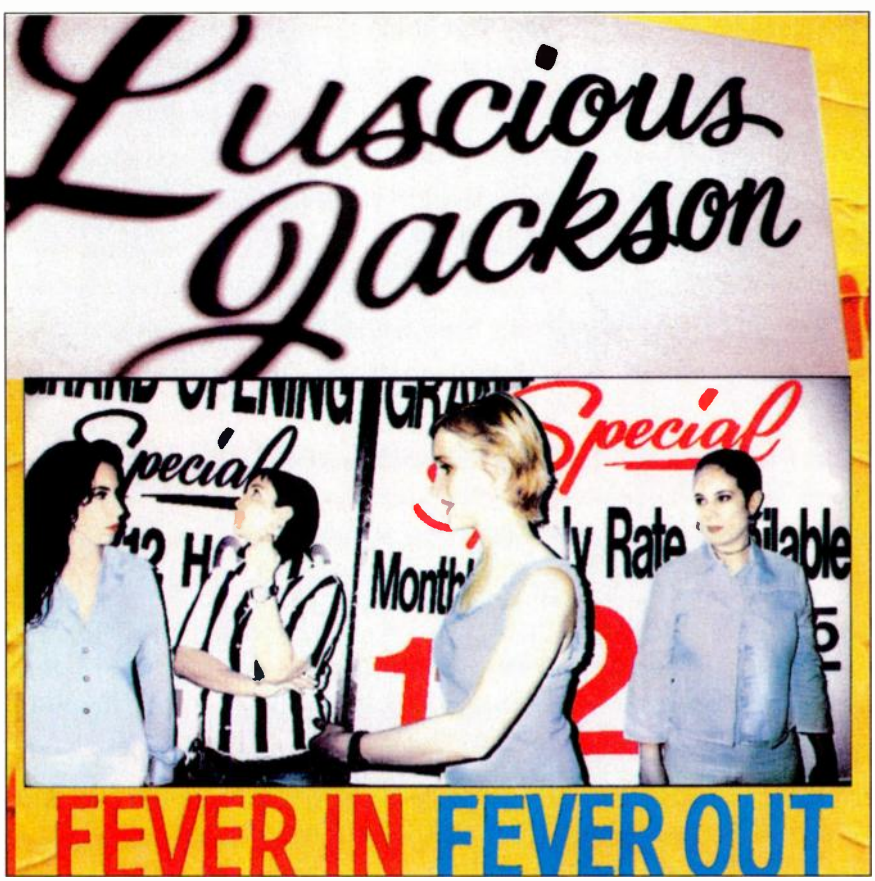
Does the drummer (Kate Schellenbach) play on top of the drum samples?
There are only four drum loops on the track. Kate played an existing loop, and we sampled her.

Was there a lot of looping going on?
The only loops were the drums. The bass, guitar, and everything else is played live.

How did you hook up with your producer, Daniel Lanois?
Daniel was recommended to us by Gary Gersh who runs Capitol Records and he really fit what we needed. We didn't want just a producer we wanted a producer who was also a musician. He's great at percussion and plays bass and guitar. Something else that was important to us was to have a producer who was mentally present, and Dan was just that.

What's this I read about using sage in the sessions?
Dan would go to Penny's General Store, which is an herb store in Manhattan, and buy sage smudge sticks. They're these big sage leaves tied together. He'd then burn them. Sage smoke is believed to clean the air and it's got a lot of spiritual connotations to it. Dan would do things like this in order to distract us and break the tension. For example, if someone was focusing too much on a part, Dan would bring us back to the natural place where music exists.

How did the recording process differ from your last disc?
On the last disc, *Natural Ingredients*, Gabby, Tony, and myself produced as a threesome. The same goes for the one before that (*In Search of Manny*). We'd go to Tony's studio, which was very limited to record. I think there were some ADATs, a Roland sampler, and a 16-track sequencer. So we'd mostly work on sampled stuff and didn't really get a chance to record much live. This time around we toured for a really long time and when we got back we really wanted to take a live approach to recording. And that's just what we did. "Naked Eye" is 70 percent live and 30 percent programmed. EQ



JACKSON 4: Strong vocal arrangements helps give Luscious Jackson a solid hit.

World Radio History

Producers Chris Kimsey (left) and Eddie Kramer

Twenty years after its release, "Frampton Comes Alive" still holds the record for the best selling live album in history.

But for veteran producers Chris Kimsey and Eddie Kramer, it's only one credit in a body of work that spans three decades, includes more than 50 gold and platinum albums and reads like a who's who of rock history.

Kramer's work with Jimi Hendrix is legendary. Not only has he recorded 11 Hendrix albums, but he collaborated with Jimi to build a rock shrine: Electric Lady Studios.

Kimsey's credits are equally impressive. To date, he's been behind the board on nine Rolling Stones albums, in addition to his work with scores of other internationally acclaimed artists.

And although the music they've recorded has changed over the years, their choice in microphones hasn't.

"I've been a big Shure fan since the mid sixties," says Kimsey. "Today I use them more than ever — for both studio and live recording. There's a very high comfort factor."

"Success over time comes from constantly reinventing yourself," adds Kramer, "something Shure has done consistently through the years." Which is why Kramer and Kimsey are frequent users of newer Shure models like the SM98A, SM91A and VP88 condensers and Beta dynamics — along with performance-proven favorites like the SM7, SM81, SM57 and SM58.

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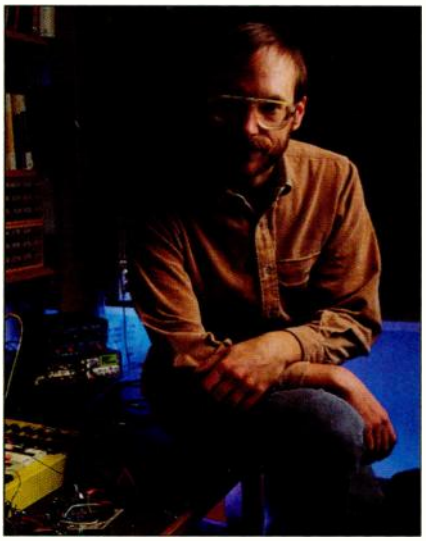
World Radio History

Revenge of the Synthesizers

Synthesizers come into their own — again

BY CRAIG ANDERTON



It's been a long time since synthesizers created much of a stir, but now a new generation of players has come up with its own kind of music — techno, dance, jungle, and a zillion mutant strains — whose pulse comes neither from guitars nor turntables, but synthesizers. And we're not talking piano and French horn samples, but sound for sound's sake. Those born after 1964 (when Robert Moog set up his card table at the NY Audio Engineering Society Convention and the era of commercial synthesis began) have never known a world without synthesis, so they tend to see synths as their own instruments, with their own vocabulary: resonance, hard sync, detuning, arpeggiation, and the like.

Since techno music reigns in Europe, that's often where synth innovations hit first. Current "hot spots" are analog synth emulators (software and/or hardware), which try to re-create and improve upon the synth sounds of old; "groove boxes," which are the descendants of early drum-and-bass packages; and special-purpose sample playback devices. (*Note:* Most of the following product information came from the Frankfurt Musik Messe, where synths were getting a major buzz. Also see the "First Look" on the Korg Z1 on page 34.)

CAN A DIGITAL SING THE ANALOGS?

It shouldn't be that hard to emulate analog circuits digitally; analog oscillators and filters come from operational amplifier technology, which are essentially analog computers. So why haven't digital synths sounded "analog" until recently? Because the digital computing power needed to do functions like cool-sounding resonant filtering in *real time* simply wasn't there yet. As hardware barriers lift, we're hearing sound generators that don't just emulate analog, they improve on it.

Although ancient analog synthesis has a mythical status, drift, day-to-day inconsistency, noise, patch recall problems, and compatibility with other gear were always frustrating, as were those custom analog chips you had to replace when they failed (assuming you could find replacements). Digital boxes deliver analog without the warts; if it's too clean, don't worry — it's far easier to grungify a sound than to clean it up.

For example, a representative from the Waldorf company was showing me, with considerable pride, how they had managed to eliminate digital aliasing in the MicroWave II's high-frequency waveforms, and indeed, it sounded gorgeous. But when I commented that I'd miss the cool effects you could get with aliasing, he went a couple menus down and toggled aliasing back on! Yes, aliasing was now an option, not a design limitation...and if you miss the drift of analog components, you can program that back in too. Waldorf in particular has done a great job of "nailing" the analog sound (right down to self-oscillating 24-dB/octave filters) in both their MicroWave II synth and X-Pole dual filter signal processor.

Another trend is control knobs and switches that send MIDI continuous controller or sys-ex data, so sequencers can capture real-time "performances" (great if you want to "play" the decay in time with the music, or screw around with filter settings manually rather than subject them to envelopes). Even a fairly simple rackmount device like Spectral Audio's "Syntrack" (a rackmount synth module with distorter) has dedicated, MIDI-savvy programming controls; so does Novation's Super BassStation, which can send all rotary control movements as MIDI data.

Some synths use analog as a point of departure, but then add tangents that let you know you're not in Kansas anymore (or any other prog rock band from the '70s, for that matter). TSI's "Virus" synthesizer doesn't just emulate analog filtering; you can route different filter "building blocks" in serial or parallel, just like with the old Curtis filter chips used in several classic synths. Other cool touches: three LFOs per voice, which can cycle once for use as envelopes, and virtually no zipper noise during parameter value sweeps, thanks to adaptive smoothing techniques. Virus comes in console form (no keyboard), sort of like the old Oberheim Xpander.

One of the most intriguing entries at Frankfurt was Clavia's 16-voice Virtual Modular Synthesizer, which is essentially a software "synthesizer construction set" that you program on-screen, then load into a hardware box you can take to the gig with you — all for under $2500. The software runs on a Windows computer, which doesn't do any significant processing and is simply a front end (Mac software will eventually be available, too). There are also two external analog inputs for processing external signals — something that more and more synths are offering these days.

ROGER LINN WAS RIGHT

The ill-fated Linn 9000 (a drums-plus-sequencer box) was plagued by reliability problems and a company that went out of business before those problems could be fixed. But its tight timing and ergonomics made it a favorite among the "groove cognoscente," many of whom cherish it to this day. Well, groove boxes are "in" again, but they've grown up. For example, En-

World Radio History

soniq's ASR-X is a tabletop box with 14 velocity-sensitive pads and an easy-to-use sequencer. It combines an ASR-10-type sampler (but with 20-bit A/D converters and expandability to 34 MB), an MR synth engine, and 24-bit DSP effects. There's the option for eight individual outputs and SCSI.

Boxes that emulate the Roland drum and bass boxes of the mid-'80s are also hot. The Jomox XBase 09 was "inspired" by the TR-909 drum machine, both in terms of sounds and internal sequencer. The analog drum sounds (under digital control) are tunable, modifiable, and have separate outputs; the sequencer can be programmed in real time, with 64 patterns (including "groove" options) and 10 available songs. The Xbase 09 is another machine that talks MIDI so you can record performances.

The virtual version of the Roland TB-303/TR-808 combo, Propellerhead Software's "ReBirth" program for Mac or Windows, does pretty much the same thing as having two TB-303 bass boxes and a TR-808 drum machine sitting in front of you — a replica of the panels shows on-screen, and clicking on buttons performs the same tricks as clicking on the buttons of the original hardware boxes. Sounds are all computer generated, not sampled, and model the sound to an uncanny degree.

Quasimidi's Polymorph is a synth/analog sequencer combination, but again, like most similar machines, the sequencer is designed more for real-time playing. (However, the synth is no slouch, offering eight voices, three VCOs with hard sync and pulse width modulation, high- and low-pass filters with resonance, and three envelope generators.) The 128-step sequencer provides transposition, cycle length, step hold, and step mute. Interestingly, Quasimidi also incorporates most of the Polymorph features and adds several more (arpeggiator, more complex filters, more voices, 61-note keyboard, etc.) in the Nucleus, its flagship "virtual analog synth." [See David Miles Huber's review of Quasimidi's Raven synth in *EQ*'s January '97 issue.]

Another groove box, Metra's Slider X GrooveStation, is designed specifically for DJs and seems more like an overachieving drum machine than a synth. It accommodates MIDI files and samples, and has five assignable "modulation" knobs for real-time control. It includes buttons for triggering sounds (which also serve for programming à la vintage drum machines), and eight linear sliders for changing volume.

SAMPLE PLAYBACK BOXES

Sample playback is far from dead, but is taking new forms. E-mu has found a niche with special-purpose sample playback units for specific musical genres. Their latest addition, Carnaval, is oriented toward the Latin music market and has drum loops as well as sounds; and their Dance Planet module is now Dance Planet Version 2, which adds more presets and new filter wah-wah and retrigger functions (e.g., synchronization to MIDI clock and arpeggiator-style grooves).

ARE NEW CONTROLLERS HEADING OUR WAY?

The final frontier for synthesis is breaking free of keyboards and using controllers designed specifically for synthesis. In an encouraging development, electronic music pioneer Don Buchla has collaborated with E-mu on the development of an ultra-cool, highly expressive MIDI hand percussion controller. Incorporating non-contact, optical sensor technology, the drum can track motion around the head, allowing superb dynamic sensitivity as well as pressure and movement control. Considering that E-mu recently acquired the Kat controller line, it looks like they're pushing alternate controllers in a big way.

It took a while, but synthesizers are developing their own personalities rather than being subjected to a lifetime of trying to sound like a piano. Mark my words: In a couple of years, when musicians go into a music store to check out a synth, they'll be more interested in the type of on-board effects than the acoustic instrument ROM sounds. To me, that would be a good sign.

Craig Anderton, author of* Home Recording for Musicians, *will be giving a master class in musical technology in Austin, TX, July 6–11 and in Frieburg, Germany, August 9–14. For more information, call 800-234-6479 or 860-567-8529.

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

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World Radio History

CIRCLE 51 ON FREE INFO CARD

Tchad Blake

PHOTO BY ED FREEMAN

The Binaural Man speaks out

BY MR. BONZAI

Mr. Bonzai: What are your most essential recording tools?
Tchad Blake: A Neumann KU-100 Head, DOD analog delay, SansAmp guitar pedal, Shure Level Loc podium compressor, Empirical Labs Distressor, and mechanical filters. None of these are really essential, just comfortable. I'll use anything.

What's a mechanical filter?
Pipes, tin boxes, rubber tubes — anything I can put a mic into and alter the response of that mic.

If you were allowed only one mic, which would it be?
The Neumann Head. That way I get two for one.

Who is your favorite engineer?
No favorites, though I think Bob Clearmountain is the best.

What are your best sounding records and why?
In the Pop category, I'd say *Colossal Head* by Los Lobos — it sounds big, tough, and 3D. In the Field category, it would be "Signs of Sardinia" by Gesuino Deiana. It's my best binaural effort.

Why are you obsessed with binaural recording?
I just love what it does in my head. It's such an underused technology, I can't believe it. Besides, I also love the travel and interaction with people I meet.

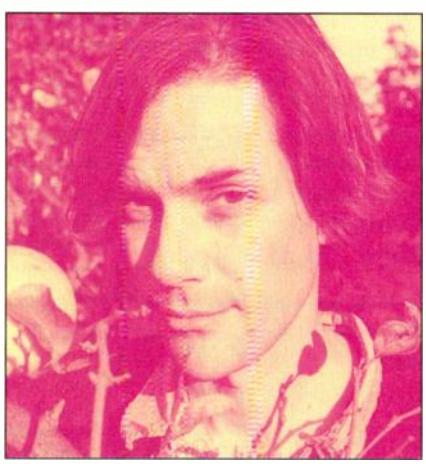
Could you reveal one of your recording secrets?
No secrets here. I'm pretty straight ahead in my recording. The mechanical filters might be the most unusual thing. I haven't seen anybody else do that.

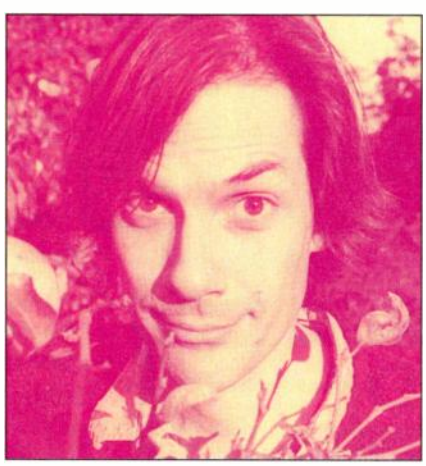
Any comments about analog vs. digital?
Analog is cheaper. You see, this is kind of a boring topic for me. I don't really care enough about the difference in sound. They both can sound great and I've heard both sound awful. I do prefer analog, but for other reasons. I record and mix at 15 ips, so tape use is low. Also, I love to cut tape.

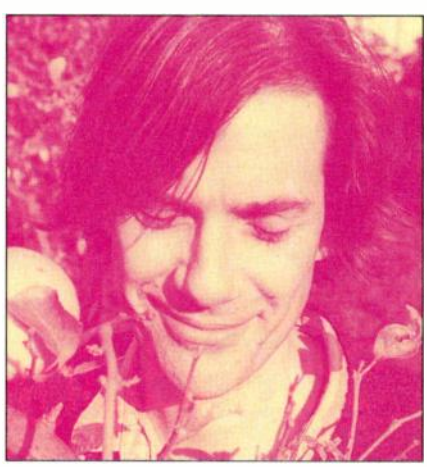
What is your role when you produce?
It's different with each artist. I like a sense of abandon in the studio and I try to work fast, not getting hung up on things that won't be remembered six

Suspect: Tchad Blake
Occupation: Engineer, producer, musician, welder.
Whereabouts: Los Angeles, New Zealand, NYC, Sardinia.
Vehicle: 1968 Ford pickup.
Diet: No meat; favors Italian & Japanese food; red wine.
Hobby: Welds industrial junk into percussion instruments/objets d'art.
First Big Hit: Los Lobos's "La Bamba" (with Mitchell Froom).
Selected Credits: Los Lobos (*Colossal Head*), Richard Thompson (*Mirror Blue*), Suzanne Vega (*Nine Objects of Desire*), Crowded House, The Finn Brothers (co-producer), Sheryl Crow (mixer), Soul Coughing, Ron Sexsmith, Latin Playboys.
Notes: When I study engineers, I look for the obvious qualities: clarity, presence, body, definition. Lastly, I look for character — a subtle signature where the engineer asserts his ego to create the re-creation. Through the years, the preferred "sound" of recording has changed, not always for the better, with the availability of new tools.

Blake is an "in-your-face" engineer, a producer who captures the essence and the energy of the artist, a guitarist, and — with David Hidalgo, Louie Perez, and Mitchell Froom — one of the Latin Playboys. To my ears, he has the remarkable ability to present a rounded soundfield (you've got a good seat in the house), spotlight the players with true appreciation, and occasionally break that soundfield so that certain sonic elements move into and out of the designated space. Sonic spotlights, if you will.







PHOTOS BY MR. BONZAI

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months on. I don't usually think things out beforehand. Spontaneity. I like to jam.

Any secrets of mixing?

Not really, but for those starting out — when getting sounds, mixing or tracking, listen to everything, or as much as you can, together. A common error is to get a great kick sound, then solo the snare, then the overheads, etc. It's best to have it all in, right from the start.

What is the first music you remember hearing?

I was five years old and it was John Prince, music for "Ballet U.S.A." To this day, it's stunning.

Which came first, the music or the musician?

The musician, depending on your definition of music.

Why did you become a recording engineer?

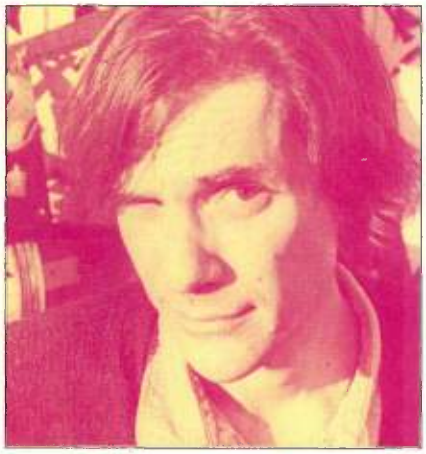
I got a job in a studio thinking I could record my own stuff after hours for free, which I did a little of. The problem was that I'm not a very good composer and just didn't write very much. So the job won out.

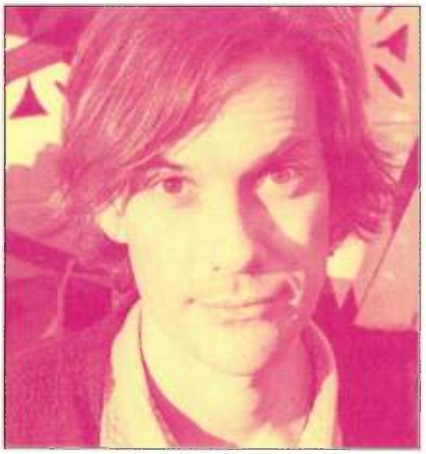
What have you learned from Mitchell Froom?

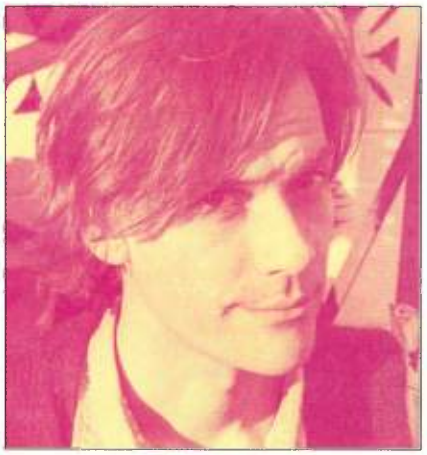
In this business, almost everything. I'd embarrass him if I elaborated and I don't want to do that. I'll just say he's great.

How do you get such gritty shitty sounds?

I don't really know very much about what I'm doing. Maybe the fact that I almost never use reverb contributes to hearing







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more rough edges. Also, I like distortion on everything. That could be a factor.

Have you ever walked off the job?

No. I've asked to be removed a few times and I've been fired once. I was asked back a month later.

What music would you like played at your funeral?

Oh...no funeral. But I wouldn't mind hearing Ron Sexsmith on exit. Mitchell and I just finished his second album, and it's awesome.

Any advice for getting a good start as an engineer?

Don't listen to people who tell you what you can and cannot do, or should or shouldn't use. It's wide open. You can use just about anything to record everything and should.

How do you use computers?

Mostly for mixing. I also use a SADiE hard-disk editor for my field recordings, and the odd fix.

Are you going to release your binaural recordings from Africa?

Yes. Peter Gabriel has created a new record label called "Document" and the *Binaural Zimbabwe Adventure* will be its first release later this year. The binaural recordings I did in Sardinia will be released this May on the Womad Select series.

Who is the most amazing artist you've worked with?

Hmmm...I'm afraid I'm amazed by all of them. But Tom Waits comes to mind.

Any comments about working with Sheryl Crow?

You want dirt, right? I don't have any. She's fun, she's a heavyweight musician, and she has my full respect. Nice forehead.

Is there anyone in the world you would like to record?

Caetano Veloso.

Who's that?

Brazilian composer who plays guitar and sings like nothing on the planet. Get *Gal e Caetano Veloso, Domingo* to start, then you can move on to the 20-odd more albums he's produced. All of them different.

What are you working on now?

Pell Mell for Geffen and Lisa Germano for 4AD. Also, I'm producing Mitchell's solo album for Geffen. Life is too good sometimes.

What's wrong with the music industry?

Oooooh, boy. I'd rather skip that question.

What is your strangest characteristic as a human being?

Cognition. It blows me away — every day.

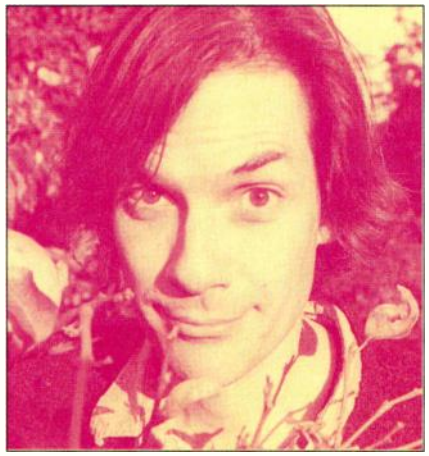
If you were a musical instrument, which would it be?

A Hohner Bravi Alpini harmonica. They always sound as if they're having the greatest time.

How would you like to be remembered in history?

The question seems too big for me. I just want to do good work and hopefully be outside time and fashion. EQ

Mr. Bonzai is working on a tune with no musical instruments.



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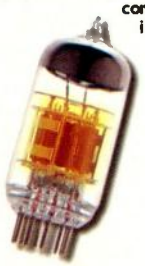

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Groovers 'n' Shakers

Bobby Guy and Ernie Lake have discovered remixing "solutions" through the use of their studio

BY STEVE LA CERRA

If you've set foot in a dance club within the last four years, then you've heard the work of Bobby Guy and Ernie Lake. Formerly known as the production team called Soul Solution (which was also the name of their musical group), Guy and Lake have worked on songs by Patti LaBelle, Isaac Hayes and Gloria Gaynor, Pulse, Reel Soul, and LaBouche, as well as having their own hits such as "Love, Peace, and Happiness." Most recently, Guy & Lake remixes have included Garland Jeffreys' "Sexuality," Crystal Waters' "Freak," Toni Braxton's "Un-Break My Heart," and Whitney Houston's "Step By Step." Guy and Lake recently took some time to speak to *EQ* regarding their remix/re-production efforts, including some of the details involved in their work on the Braxton and Houston songs.

DYNAMICS DUO: Ernie Lake (left) and Bobby Guy have used their studio to produce some of today's most popular remixes.

PHOTOS BY STEVE SANOS

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TOOLS OF THE TRADE

Guy and Lake begin by explaining that at the session for the original mix of a song, it's become standard practice for the producer to print extra mixes to DAT, such as an *a cappella* mix, or a mix of background vocals (both could be with or without effects), specifically because a remix may happen at a later time. So when a record label calls for a remix, the duo receive certain materials required to get the job done. Bobby Guy informs us that, "In the case of Toni (Braxton) or any big artist, we usually get a 2-inch safety master and an *a cappella* DAT so that we can compare the two and listen to the vocal phrasing. Sometimes we get lead vocal on one channel and SMPTE on the other channel of the DAT. Or sometimes it's just lead vocal in stereo with effects, which we try to stay away from — we normally don't use the effects.

"The SMPTE means nothing to us [more on than later —Ed.], because generally we will take the lead vocal off the 2-inch. Hopefully, it's comp'd and we don't have to sort through it. For the background vocals, we'll either rebalance and sample them, or hopefully we'll get a mix of the background vocals separately. There are different situations depending upon what raw materials we get from the producer." If the lead vocal is not comp'd (due to the fact that some producers comp during the mix from the various raw vocal takes), then Guy and Lake must re-comp line by line, using the raw takes and comparing their work to that of the finished vocal of the original mix.

LET THE GAMES BEGIN

Once a finished lead vocal track is established, the games begin at Guy and Lake's Reel Tyme Recording in New York City. An important thing to consider when discussing a Guy/Lake remix is that the tempo is generally at a higher number of beats-per-minute (bpm) than the original. For example, the tempo of "Un-Break My Heart" was originally at around 60 bpm. But these days, their remixes are typically around 125 to 128 bpm. So they loaded Toni Braxton's lead vocal into a Mac IIfx running Steinberg's Time Bandit program. Time Bandit allows the vocal to be lengthened or shortened (thus slowing down or speeding up the tempo) without changing the pitch. By bringing up the tempo of Braxton's vocal track to about 63 or 64 bpm, Guy and Lake were able to double up the musical arrangement beneath the vocal for an effective tempo of around 127. In cases where the tempo of the original vocal is too far away from "optimum dance bpm," they try to get the vocalist back into the studio to re-cut the vocal over the new track they have produced.

Interestingly, Whitney Houston's "Step By Step" remix required the vocal to be time-stretched more than Braxton's vocal. "Step By Step" originally had a tempo of 116 bpm, making it more of a mid-tempo song. In their first attempt to time-stretch the vocal up to a new tempo of 126 bpm, Guy and Lake used the 2-inch (safety) master as the source for the lead vocal, but Lake says, "It just didn't sound right. So we went back to the DAT that Arista (Houston's label) sent to us. This DAT had the lead vocal with effects, and when this was time-stretched to the new tempo, it sounded great."

After the lead vocal has been time-compressed or -expanded, it is digitally loaded into Studio Vision Pro running on a Power Macintosh, where the musical arrangement will be developed. Note that there is no SMPTE code involved at this point — the lead vocal is manually aligned to a reference click in Studio Vision Pro, piece by piece if necessary. According to Lake, the vocal will have to be moved

CUSTOMER SERVICE: Garland Jeffries finds that working with Guy and Lake holds many surprises.

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

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

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

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

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

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

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

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

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

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We'll help. Study these pages carefully. We think you'll soon see that Layla delivers the features and performance you want—at a price that's remarkably easy on your budget.

Okay. Got the picture? Obviously Layla isn't just another card, but a complete system. A system designed to help you make great-sounding music. Designed to grow as your needs grow. Designed to change the way you think about hard disk recording.

Designed to knock your socks off.

Different. Powerful. Multitrack. Digital. 24-bit. Rack-mount. Sync. DSP. MIDI. Timecode. Compatible. Expandable. Lovable (truly). $999. (Wow.)

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Vintage Audio History

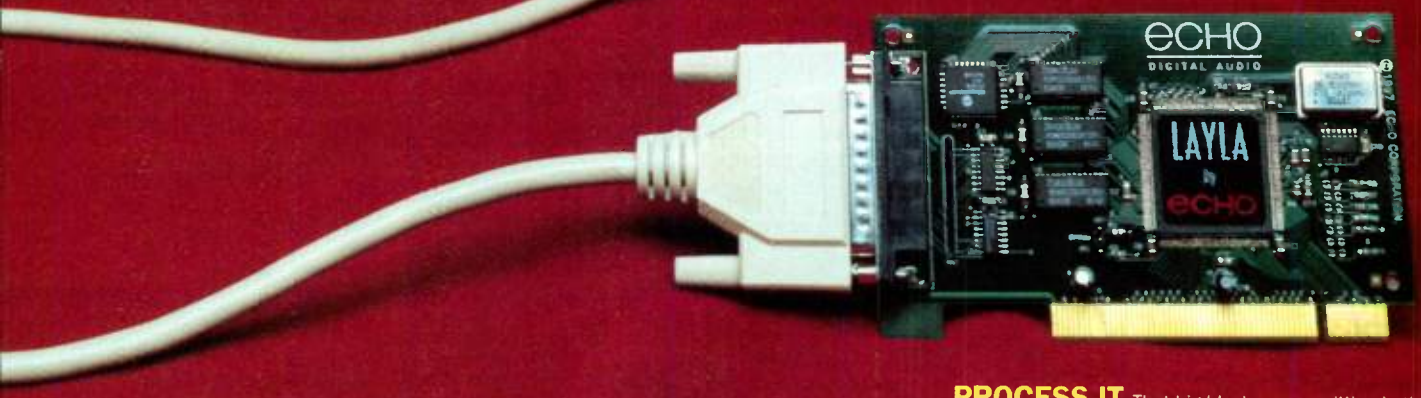
PLAY IT Forget about having to premix output tracks—forever. Layla features ten independent balanced analog outputs, each one boasting a superior quality DAC, for true 20-bit audio performance. And our exclusive OmniBus™ audio assignment architecture lets you easily configure the outputs as aux sends, monitor mixes, discrete track outs—you decide. Plus you can play back on all ten output channels while you're recording on all eight input channels . . . that's not just full duplex—that's octadecaplex!

EXPAND IT Now for the really big news: You can synchronize multiple Layla systems—expansion is as simple as plugging in another card and connecting the word clock output of the master unit into the word clock input of the slave. (Daisy-chain as many Layla units as you have PCI slots in your computer.) When you build a larger system you not only get more hardware ins and outs (how does 24 inputs x 30 outputs grab ya?), you get more (lots more!) DSP horsepower.

MIDI IT(!) All right. We admit that MIDI in/out/thru probably isn't the most earth-shattering feature you've ever seen (even if it is opto-isolated). But we know you'll appreciate the convenience of being able to create a simple, yet powerful audio/MIDI multitrack recording system without having to hook up a ton of additional gear (or worrying about your MIDI interface card conflicting with the IRQ on your digital I/O card, which conflicts with your SCSI card, which conflicts—you get the picture). Did we mention that Layla is a true Plug and Play™ system? That's right, no jumpers to set, no IRQs to configure (in fact, only one IRQ is used for both audio and MIDI functions and no DMA channels at all are used). Setup is as simple as plugging in the card and connecting the included multipin cable from the card to the audio I/O unit.

SYNC IT Layla offers synchronization capabilities that make it perfectly at home in a variety of professional environments. Synchronize to picture via SMPTE/MTC. Lock to external word clock. Generate sample-accurate sync from the master clock out. (Our word clock provides continuous single-sample resolution from 5kHz to 50kHz.)

DIG IT Create a 24-bit stereo master mix to send to the digital output. (Yes, Virginia, there's stereo 24-bit digital input as well.) Or maybe an all-digital effects loop is more to your liking? Whatever the application, your precious audio tracks are handled with 24-bit precision throughout Layla's internal audio path.



EDIT IT Work with total freedom. Edit your music with the precision and flexibility that only random-access disk-based recording can provide. Layla is compatible with any audio recording/editing application that uses standard Microsoft Windows 95 calls—which means Layla works with virtually all of today's most popular programs, including Cakewalk's Cakewalk Pro Audio™, Steinberg's Cubase Audio™, Emagic's Logic Audio™, and Sonic Foundry's Sound Forge™ (to name just a few). You also get support for software plug-ins from respected manufacturers like Waves and Arboretum Systems. Don't yet own recording software? Not to worry: Layla comes complete with a custom version of Syntrillium Software's Cool Edit Pro™—a powerful multitrack audio recording and editing environment—so you can enjoy a no-hassle musical experience right out of the box. (Our Macintosh software package, which provides compatibility with a host of professional audio applications, is scheduled for release in Summer '97.)

PROCESS IT That big black square sitting in the middle of the Layla PCI interface is Motorola's latest generation DSP—the 56301, a 24-bit chip running at an astounding 80 million instructions per second. In addition to being a giant chunk of raw processing power, it's the PCI bus master, meaning that it handles all the routing of data in and around your system. That leaves your computer's CPU free to do things like drawing screens really fast. The 301 also handles audio timing information, so you get dead-on synchronization accuracy and—here's one for the engineers out there—zero-latency sample-positioning (in other words, it always knows what audio is supposed to play when and where).

eCHO IT Why does it say eCHO on the card? Simple. Our strategic partners, eCHO Corporation, are the engineering team behind Layla. eCHO has been providing audio ASICs and DSP system software and drivers to the computer industry for the last 17 years, and their designs have been sold and licensed to such industry leaders as Analog Devices™, Motorola™, Rockwell™, Sony™, S3™, and VLSI™. Why should you care? Because it's your way of knowing that the Layla hardware and software driver (the key to making Layla compatible with so many of the great Windows 95 audio applications) were designed by people who really—we mean *really*—know computer-based digital audio.

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Roland PMA-5: The Project Studio Sound Card?

Sure it's cute, but Roland's "music assistant" is a solid creative tool

BY CRAIG ANDERTON

Roland's PMA-5 is billed as a "personal music assistant" — a handheld, portable sequencer with a decent set of sounds that you can use on the road to write tunes. And while that's all true, there's more to the story than meets the ear.

This article is not a review *per se*; the PMA-5 has been around for a while, and any pros or cons of the concept are pretty well-understood. Instead, we'll cover what aspects of the PMA-5 are relevant to project studios, including some new software that improves interfacing with computers and sequencers.

BUT FIRST, THE BASICS

You create songs with the PMA-5 by stringing together factory or user-programmable *backing tracks* (with phrases of drums, bass, and two other parts) done in a particular "style," and specifying when chord changes occur. The factory styles run the gamut of pop music, from blues to techno. Four additional song-length tracks allow recording solos and other overdubs while the backing tracks churn along in the background.

As expected, you can edit and move tracks, record in step time or real time, turn sequences into styles, edit styles, shift note timing, and so on — the usual sequencer tricks. What's unusual is the interface: a slick, pen-driven display that takes a page straight out of the Newton book.

The music-making process isn't all that interactive, since you assemble a phrase before playing it. (I'd prefer continuous play, where you select from a pool of phrases and keys, with the sequencer remembering the order in which you selected them.) However, once a song is in place, editing is a piece of cake. One of the best applications I've heard was from songwriter Deborah Mays. She writes rock tunes, but was advised that some of her songs would be more saleable if rewritten for country. By changing styles in the PMA-5, she tried out various country arrangements and used those in her demos.

PMA-5 MEETS THE COMPUTER

As a computer sound card, the PMA-5 has a lot going for it:

- Mac/Windows compatible
- MIDI In/Out
- General MIDI/GS compatible, 28-voice sound module
- Onscreen, somewhat playable "keyboard"
- Support software
- Portable

For example, the PMA-5 makes a great PowerBook companion: use your favorite sequencer, and connect the printer or modem cable to the PMA-5

STUDIO TO GO: Well, not really, but the Roland PMA-5 can help you capture those musical ideas.

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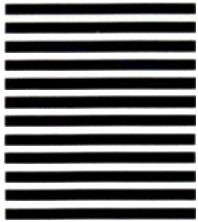

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set to GM/GS mode. Plug in a set of headphones and you have a pretty complete music-making setup that also works especially well for "proofing" sequences while away from your main computer.

THE LATEST WRINKLE

Until recently, the PMA-5 has been limited by the proprietary nature of its software, but that is changing with Roland's PC Communication Kit ($49.95) for both Mac and Windows. It adds:

- PMA-5 Conversion Tool. This program has three main features: bulk dump save/load with the computer, Standard MIDI File conversion, and compatibility with Roland's Music Collage for Windows (i.e., it converts Sound Canvas data to something the PMA-5 can understand).
- Serial MIDI driver for Windows and OMS for the Mac, with appropriate serial cables.
- Additional Style Data. You can always use new styles, right?

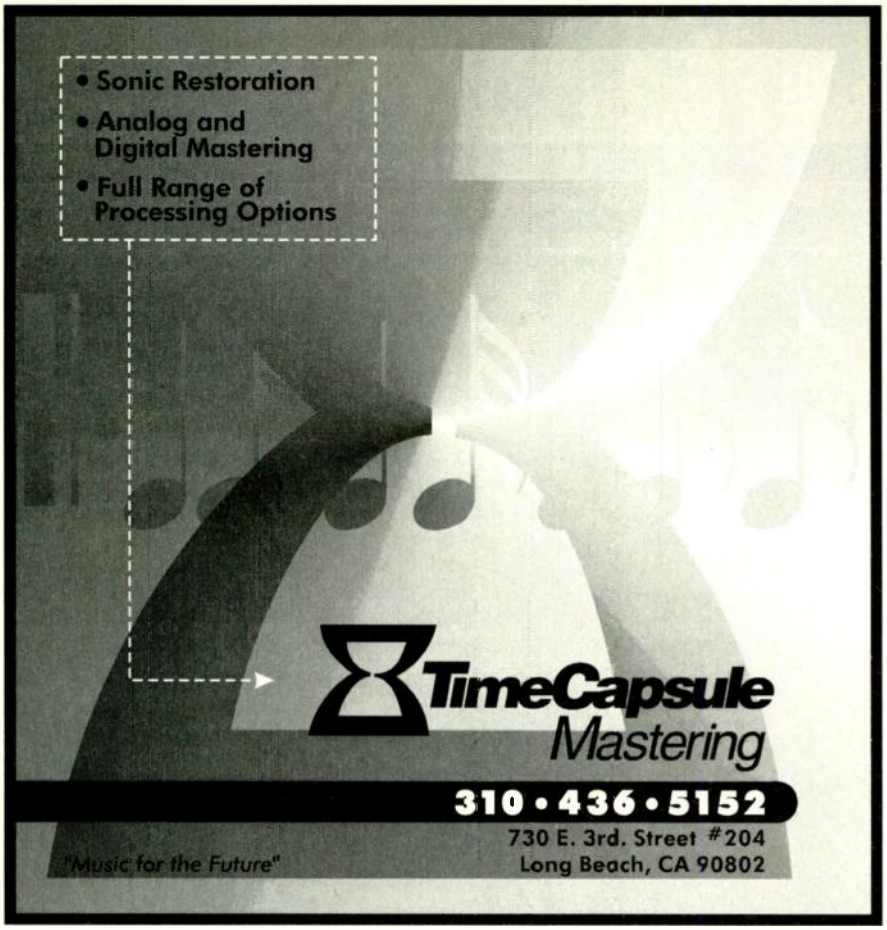
The SMF conversion is crucial, as you can transfer sequences written on the PMA-5 over to your main computer for tweaking. Conversely, if you have some fabulous rhythm track on your computer, then have to go on the road, blast the data into the PMA-5, and work on the plane. SMF conversion also simplifies transferring styles written on your computer over to the PMA-5.

The Serial MIDI driver for Windows enables sending data directly to the PMA-5 using the computer's serial port. If you already have a PMA-5, this driver is available for free from Roland's web site (www.rolandus.com). For Mac fans, OMS compatibility integrates the PMA-5 better with your MIDI setup.

FUN & GAMES

Don't forget — during break time, you can always use the PMA-5 as a MIDI peripheral to augment a Sound Blaster-type board. Feed the sound card's MIDI Out into the PMA-5's MIDI In and go into GM/GS mode; with more and more programs and Web sites generating MIDI, having quality sounds instead of 2-operator FM synthesis greatly enhances the listening experience.

So yeah, the PMA-5 has gotten its accolades as a cool consumer toy and all that. But look a little deeper, and you might find some novel solutions for the project studio composer. EQ



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Roger Nichols of EQ:

"**The 730** is a great sounding piece of equipment... **Provides an entirely fresh approach to dynamic control**... Besides doing an exemplary job at the normal dynamic parameters, **the 730 has added features that are virtually impossible with analog dynamic processors**... attack, release, threshold, gain and ratio, range, **shape, mix, and stereo width**... If you have ever sat in front of a compressor saying to yourself, 'I wish this thing would...' well, this is just the puppy that can. **Good work, Valley Audio, I can't wait to see what's next.**"

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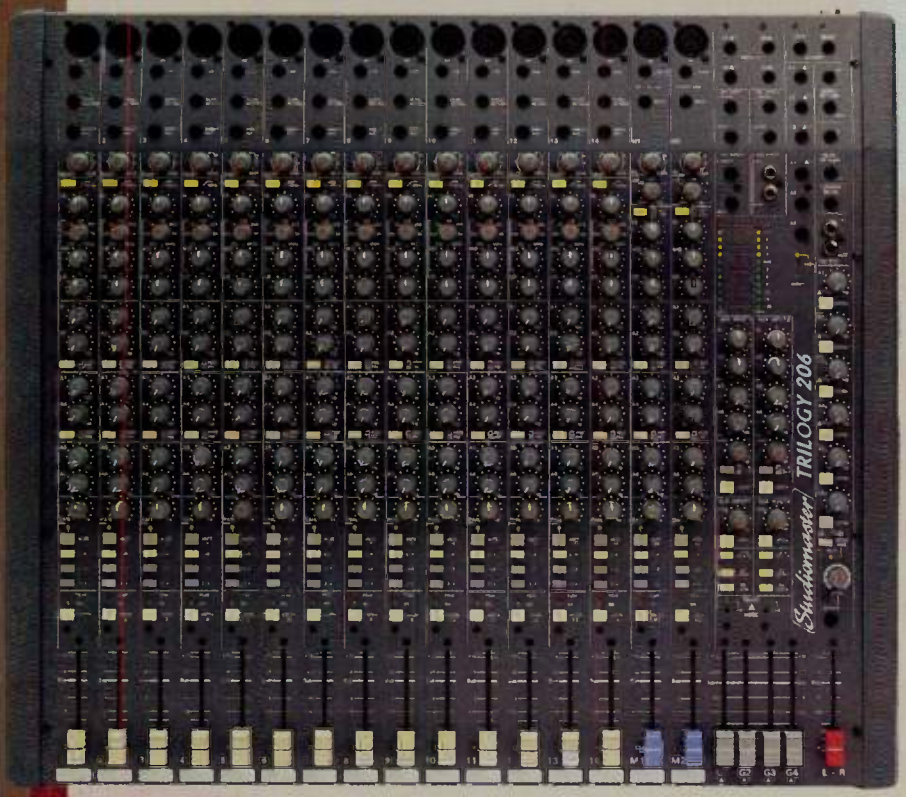
Just Because Your Application Changes Doesn't Mean Your Console Has To.



The new TRILOGY series establishes new and exciting standards in mixing console design. While most mixing consoles are created with only one purpose in mind, the TRILOGY has been designed to easily handle a variety of professional applications with a stunning array of features and superior audio performance. Wether you are mixing live sound, multitrack projects, audio for video, electronic keyboards, or even a dedicated stage monitor mix, the TRILOGY provides all the tools you'll ever need to create a perfect mix from start to finish. Up until now, this kind of flexibility and performance could only be found with mixers costing thousands of dollars more. Backed by Studiomaster's legendary reputation for quality, the TRILOGY is the ultimate workhorse for even the most demanding and ever changing professional applications.

Check out just a few of the TRILOGY's many features:

- 12 (rackmountable) & 16 channel versions
- 10 channel expander
- Main channel direct outputs
- 3 band EQ with mid sweep
- 100Hz channel high pass filter
- 6 full time "balanced" auxiliary sends (pre/post selectable)
- -20dB signal present LED indicators
- Channel mutes with LED status
- PFL and solo in place (globally selectable)
- 4 assignable stereo auxiliary returns, 2 with high & low EQ, and aux 5 & 6 cue sends
- Control room monitor and headphone outs
- 2 track master tape outputs
- Balanced main, mono, sub-group and auxiliary outputs

INPUTS & EXPANSION

Both TRILOGY models afford a tremendous amount of usable inputs - 24 on the TR166 12 channel and 28 on the TR206 16 channel. The TR140ex 10 channel expander can be added for a total of 14 more available inputs.

MON:STER CHANNELS

Each of the last 2 channels of the TRILOGY and the 10 channel expander feature an XLR balanced microphone input and 1/4" left and right stereo line inputs, and both can be used simultaneously - great for effects returns, keyboards, and any other stereo line or mono microphone source. A clever EQ assign switch routes the channel equalization to either the stereo line input or the microphone input.

STAGE MODE SWITCHING

A unique switching circuit turns the TRILOGY into a stand alone 6 bus stereo out stage monitor console. When stage mode is engaged, auxiliaries 1-4 are routed to the subgroup outputs, providing fader control of auxiliary 1-4 master outputs. Combined with auxiliaries 5 and 6, the TRILOGY offers 6 discreet monitor sends. The L/R outputs also remain active and can be utilized for a stereo in-ear monitor or side fill system.

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Born a RAMBL

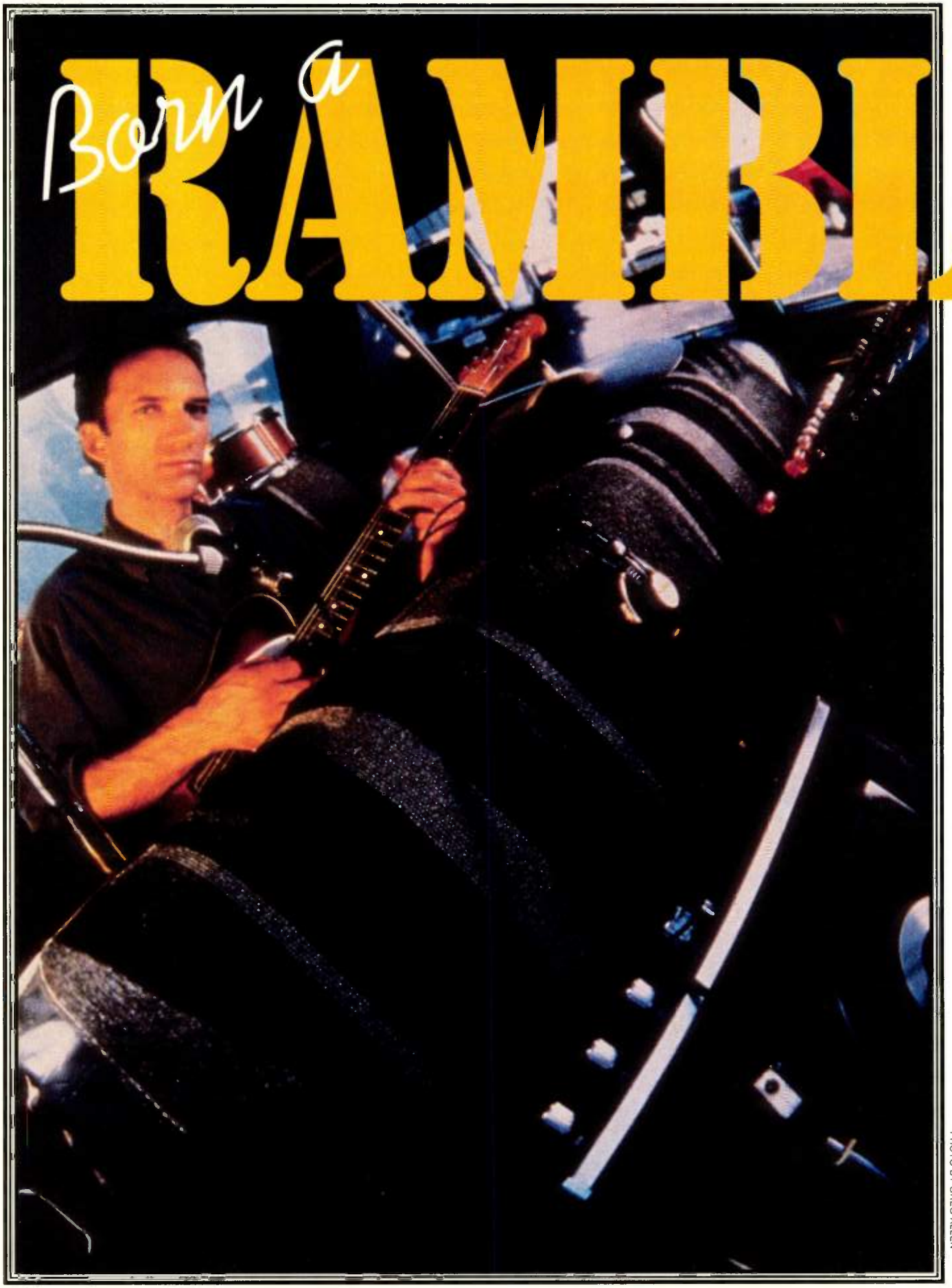

PHOTO BY GREG ALLEN

World Radio History

ERMAN

How Ben Vaughn cut an album in his 1965 Rambler American

BY ALAN DI PERNA

"See, it really sounds good in here...." Ben Vaughn sits in the back seat of his '65 Rambler American four-door sedan, strumming open chords on his Takamine EF-36 acoustic. Up in the front seat, I'm wallowing in old car smell and coming to the realization that an automobile interior is very much like a small iso booth. The dimensions are just about right, and there's a similar combination of reflective and absorptive surfaces. Whatever acoustic phenomena are at play, Vaughn's acoustic guitar certainly sounds nice and tight, with plenty of midrange presence.

"The windshield leaks, so there's a lot of water damage in the headliner," Vaughn volunteers helpfully. "I think that has something to do with the way it sounds. And the carpet on the floor's ripped up, so there's metal down here."

Americans do all kinds of things in their cars — eat, sleep, shave, make love and phone calls. Ben Vaughn made an album in his. Fittingly enough, the record's called Rambler '65 — a first-rate collection of clever, concise, rootsy rock tunes. See, this guy's not just some kook. Vaughn is a critically lauded singer-songwriter with seven prior albums to his name. He's co-written with heavyweight tunesmiths like Marshall Crenshaw, Rodney Crowell and Peter Case. On the production front, his credits include the most recent album from rock cut-ups Ween, 12 Golden Country Greats, and Cubist Blues, a collaboration with the legendary Alex Chilton and [ex-Suicide vocalist] Alan Vega. Vaughn is currently music composer for TV's *Third Rock from the Sun* and *Men Behaving Badly*, a job he does out of a hangar at Santa Monica Airport in L.A. (But that's another story.)

AUTO LOCATION

So how does a serious music industry professional end up cutting an album in his car? Actually the idea was born of a frustrating conga overdub at a studio in Hoboken, New Jersey. "We could probably get a better sound in my car," an exasperated Vaughn cried out after several hours. Little did he know he'd sealed his own fate.

"It was one of those statements like, 'My grandmother could pitch better than that,' " he laughs. "But I immediately starting thinking seriously about the sonic possibilities. Plus the whole concept appealed to me. Rock 'n' roll and cars have always had a symbiotic relationship. I don't think that rock 'n' roll would have been possible if teenagers weren't driving in cars."

Vaughn, who has owned Ramblers exclusively all his life, has two Americans, a '64 and a '65. He grabbed his acoustic guitar and soundchecked them both. The '65 won. The vehicle in question, mind you, is no museum piece. Its dark blue exterior is sun faded and rusting out around the edges. The thing didn't even run at the time, and for a year and a half hadn't budged from the driveway of the house where Vaughn was then living, in Collingswood, New Jersey. "I felt kind of sorry for it, actually," Vaughn says.

FULLY EQUIPPED

Yes, the production was top-drawer all the way. The artist had an old Fostex 1/2-inch reel-to-reel 8-track (with one busted track, no less) propped up against the back door on the driver's side. Up in the front seat, behind the steering wheel, was a modest TASCAM M-208, 8-channel mixer, sit-

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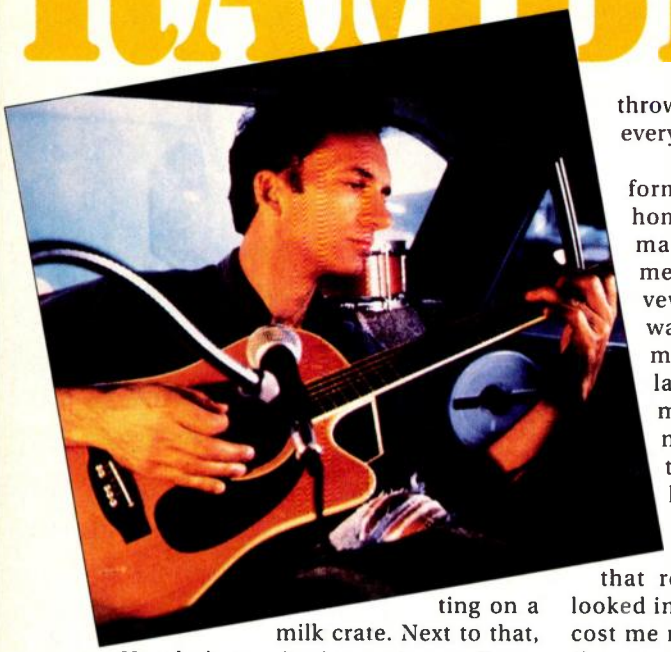
RAMBLERMAN



ting on a milk crate. Next to that, Vaughn's monitoring system: a Panasonic receiver/turntable driving a pair of Radio Shack Realistic speakers tiny enough to perch on the dashboard with room to spare. As a monitoring alternative, there was a pair of AKG headphones. To power all the equipment, Vaughn ran an AC cord from the house, throwing it out his kitchen window every morning.

This superstar cache of gear formed the nucleus of Vaughn's home studio at the time. Its normal residence was the basement of the house with the driveway in which the Rambler was parked. "I never had any money 'til I started doing TV!" laughs the dark-haired, 40-ish musician. Which is why he never repaired the broken track on his Fostex: "My house got hit by lightning once, and for some reason, ever since then, track 2 on that reel-to-reel never worked. I looked into it and found out it would cost me more to fix it than I paid for the machine when it was new. The LED lights don't work either. So I have no idea what levels I'm putting on tape. I just listen, which is the way you oughta do it anyway. I just record and listen for distortion. If it sounds good, I move on. I recorded three albums on this machine and I had no idea what the levels were."

One advantage of recording in his car, Vaughn says, is that it enabled him to indulge his slapdash engineering techniques in peace. There wasn't any room onboard for an engineer or assistant. By not fussing over engineering, Vaughn was able to focus on the real matter at hand: the songs.

"It was a process that I needed to go through at that point in my life and career," he says of the project. "I wasn't going to let somebody talk me into going 24-track or using a noise gate and getting a prettier sound on an acoustic guitar. Which is always happening when you're in a studio with real engineers. Engineers in real studios usually have clients that would freak out if something suddenly sounded bad. So they make very polite, gradual little changes in the sound. Whereas I'll just grab an EQ knob and put the midrange all the way up. I like to make things sound really bad first, then subtract. Rather than politely going toward a point, I like to start by finding out how much is too much."

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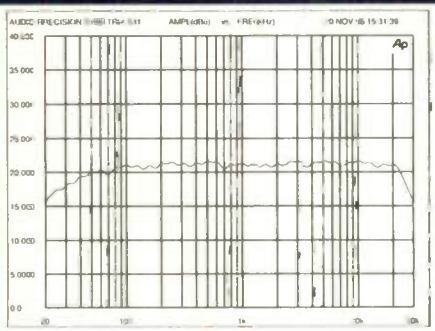
Will a wet woolen blanket placed over my PA system enhance or degrade sound quality?

The answer is: The blanket will degrade sound quality. The so called ***BOSS*** effect (Blanket Over Sound System) can also be achieved without the blanket, but is nevertheless an *undesirable* effect. Often, when the blanket isn't present and the PA still sounds bad, the culprit is none other than the system's graphic EQ!

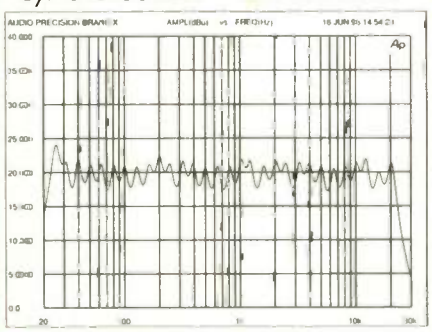
Symetrix is making a couple of new concert sound quality graphics that will blow the blanket off your PA! The details:

➲ **Constant Q equalizers** exhibit superior feedback control characteristics, but don't all sound the same. Filters must combine with minimum ripple to achieve predictable frequency response. Q must be optimized to limit interaction between adjacent bands. Our filters exhibit the very best combination of minimum ripple and maximum selectivity.

The graphs to the right were made with all faders at maximum boost, not a typical setting, but a test that can immediately pinpoint an equalizer's problems. The ripple from the well known brand X is not hard to hear! The Symetrix graphics not only look better on paper, they sound significantly better!



Symetrix 531E ∩ ∪Brand X EQ



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➲ **Variable low and high cut filters.** Visible woofer cone movement is the result of subsonic audio passing through your system. Our variable low cut filter stabilizes your speaker voice coils without sacrifycing low end audio. Ultrasonic audio destroys horns. The 531E and 532E variable hi cut filter removes the high frequencies you can't hear, and saves you money at the same time.

➲ The two position **range control** switches the 31 graphic faders between a standard +/-12dB range and a high resolution +/-6dB range.

➲ **Large high contrast knobs and crisp graphics.** A feature we know you'll appreciate late at night when you're really tired. (Many EQ's don't even have fader knobs!)

➲ **Servo controlled output stages** eliminate large electrolytic caps from the output. The result is zero DC output offset, a low -3db rolloff point (6Hz), and the elimination of output loading effects.

➲ **LED input level ladder.** An EQ's dynamic range spec can only be achieved when the incoming signal is properly adjusted. With the 531E and 532E input signals are set precisely where they need to be. Dynamic range of over 112dB is assured.

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Specs can tell you a lot, but the sound is everything. Give our 531E or 532E a try and we're sure you'll agree that these EQ's can indeed **blow the blanket off your PA!**

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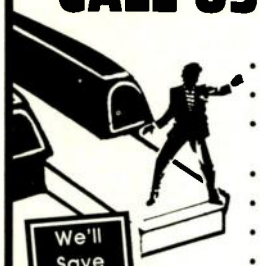
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RAMBLERMAN

LOADS OF CARGO SPACE

The back seat of the Rambler, next to the multitrack machine, was Vaughn's performance space. He'd sit there, strum one of his guitars and sing. Besides his Takamine acoustic, he used a newish Fender Telecaster and a '66 Fender Mustang. The electric guitars were sometimes recorded direct, usually through one of Vaughn's stomp-box effects. But he wanted miked amp sounds as well, especially the tremolo on his Fender Deluxe combo. Since he likes to cut his vocals and rhythm guitar at the same time, he needed to find an iso booth for his amp. Luckily, Rambler's designers had foreseen his needs and provided a nice trunk, just the right size. A mechanic friend came up with the idea of removing a tail light and running AC power and the guitar lead through the hole.

"I just laid the amp in the trunk," Vaughn explains, "resting it at an angle against my toolkit. I hung the microphone [a Shure SM58] from the trunk lid with some duct tape. And when I closed the lid, it was a close-miked amplifier: maybe half-an-inch from the grille cloth. I listened to it, it sounded great, so I recorded it. And if you solo up the vocal tracks, you won't hear any leakage from the guitar amp."

Try that with a Japanese car.

Apart from the Shure SM58 he used on the amp, Vaughn had just one other mic, a Shure SM57. He alternated between the two for vocals. A major factor in his vocal mic choice was whether or not he was going to sing through one of his guitar stomp boxes (which he did quite a bit on the record): "When I wanted to effect the vocals, I would use the '57 more, because it doesn't have a ball on the end. So you can get up really close on the mike. When you're singing through a distortion pedal, it seems to sound best when you really eat the mic. The '57 is better for harmonica for that same reason. The '58 is more of a pretty mic for normal vocals."

Vaughn is one of those guys with 101 uses for his stomp boxes. For example, what sounds like a Theramin or synth behind the sitar solo in "Levitation" is really just Vaughn fiddling with the regeneration knob on his Ibanez FL9 flanger pedal. As for singing through effects, that's something that goes back to Vaughn's earliest home recording experiments with a 4-track Dokoder when he was in high school.

"So this record is kind of getting back to my roots," he says: "the whole idea of getting real excited about a sound and then recording it before you talk yourself out of it. Ride each idea quick, try to do one take, and try to keep the whole thing immediate. I think, for that reason, this record is my favorite of all the ones I've made. Just the way it sounds — alive. I always had trouble getting that in a real studio with my music.

RIDE SYMBOL

Vaughn even managed to do live drums in his car — albeit in a small way. He had a 10-inch Premiere snare that he'd just lay on the back seat to play. There was also a little 10-inch cymbal of no discernible brand that looks like it came off a hihat. Apart from a cheesy Casio preset beat on the track "Song for You," most other drum sounds on the album came from an Alesis H-16 drum machine. But Vaughn took pains to avoid the tick-tock drum machine rhythms that are the bane of most home — and car — recordings:

"I always mix in other percussive elements so that the drum machine isn't the only source of rhythm in the track. I do things where the acoustic guitar will take up part of what a drum kit usually does. And maracas will take up part of it. For me, the maracas are the lead instrument on "Seven Days Without Love" [the album's first single]. Maracas aren't really appreciated enough today. I always liked those Bo Diddley records and Manfred Mann's "Do Wah Diddy" and their version of "John Hardy" [the B side of their single, "Sha La La"] — those are heavy maracas songs. But the best maracas stuff is the Stones' "Jumpin' Jack Flash" and "Street Fighting Man." Jimmy Miller [the Stones' producer at the time] was apparently very into maracas."

REGULARLY SCHEDULED TUNEUPS

To make an album in a car, you must be organized. "Before I even started," Vaughn says, "I made a checklist of what I was going to do — which songs I was going to record and which instruments I was going to use for each song. I had to do that first. You can't really experiment with different instruments too much when you're in a Rambler. You gotta know what pieces of equipment you're going to have in there with you to record a given part. So it was good discipline for me — squeezing as much out

continued on page 130

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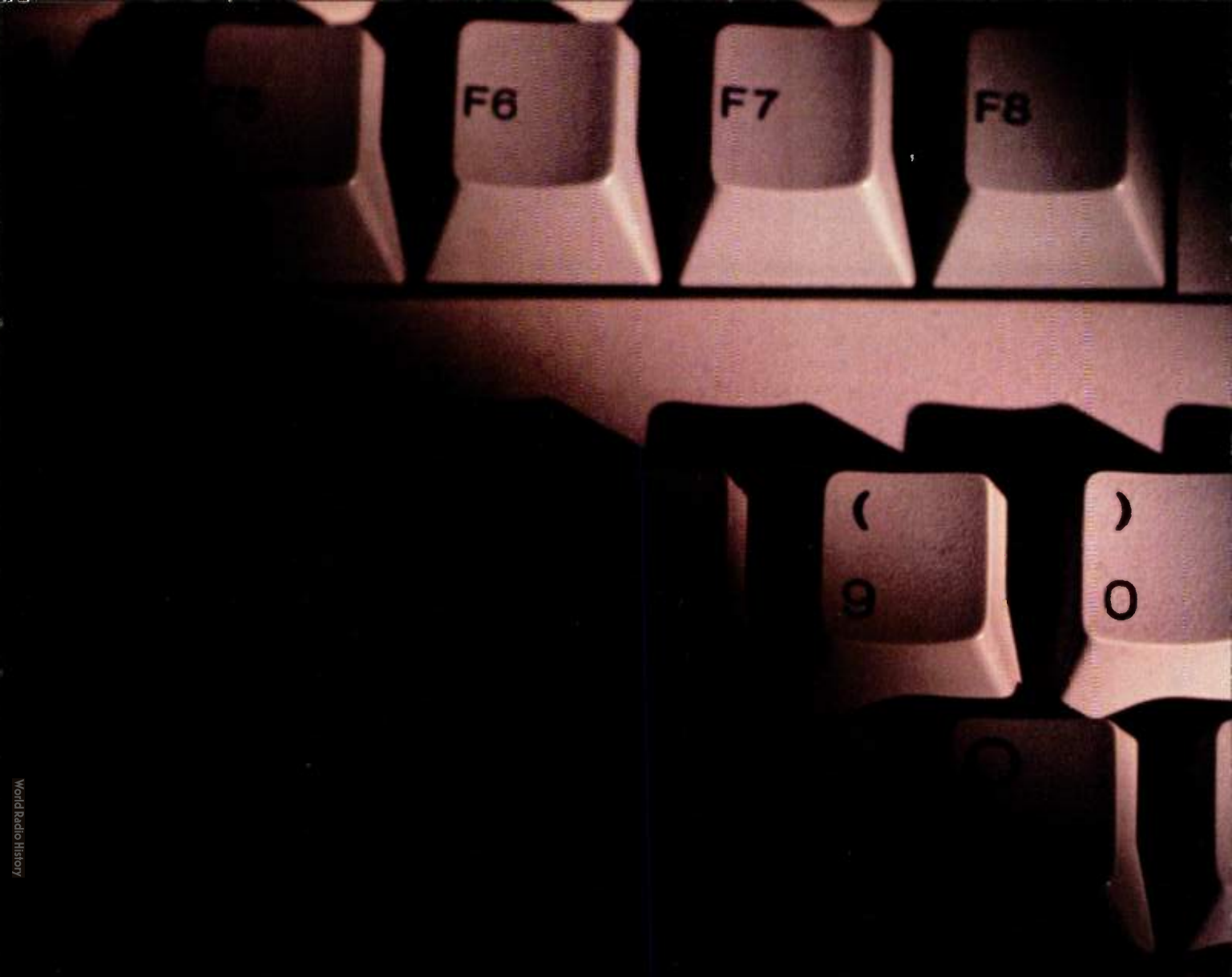

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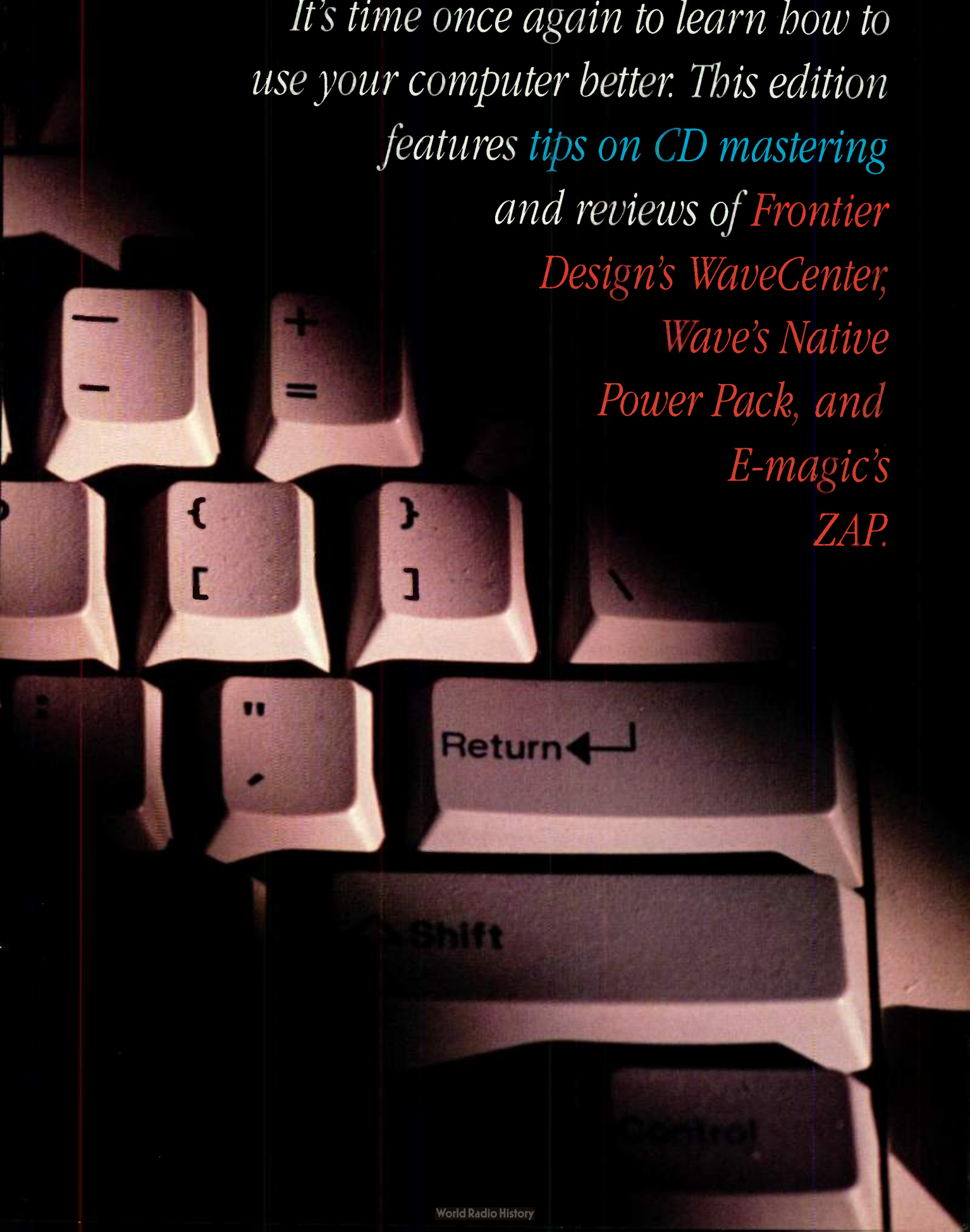

It's time once again to learn how to use your computer better. This edition features tips on CD mastering and reviews of Frontier Design's WaveCenter, Wave's Native Power Pack, and E-magic's ZAP.

World Radio History

Mastering Tips: Integration Via CD Writer

Now that you are cutting your own CDs, here's how to get the results you want

BY EDDIE CILETTI

Tracking, overdubbing, or mixing are three distinct tasks each requiring a very specific state of mind. Mastering is more than that; it's mind altering. Now that you've got a CD writer, the next step is to roll your own CDs. Here are some important points to help with perspective:

• **Monitor Environment:** Perspective is key, so choose a comfortable monitoring level using a commercially mastered CD and stick to it. (If you need to listen at low levels from time to time, use the "Dim" feature, if available.) Then make a mark and/or place some tape on the monitor level pot as a reminder. It's a good idea to have a few choice CDs on hand and advisable to make frequent comparisons.

• **Assembly:** After collecting the material (music, spoken word, etc.), choosing an order, and deciding whether to put silence or a crossfade between the tracks, the more difficult task will be to set the levels from piece to piece. No matter what you thought you knew about limiting and compression — on a per-mix basis — mastering a compilation will be an ear-raising experience.

• **The Level Law:** Everyone wants their CD to be the loudest (it must be a music thang), but there is no "overdrive" in the digital domain. Digital Law states that nothing can be louder than 0 dB full scale (fs). First determine the loudest piece. If it doesn't seem as loud as the reference CDs, it may be necessary to use more compression. Some dynamics processors will simultaneously compress and peak limit. To preserve dynamics and to avoid elevating the noise floor, use less-aggressive compression with more peak limiting. Simply leveling the peaks will allow the overall volume to be raised.

If your workstation supports plug-ins, check out the Waves L1 Ultra Maximizer, which will up the "average" level high without getting "overs" via its peak limiter. The L1 also has very nice noise-shaped dithering (something we'll get into another time).

NOTE: Most mastering tools — software and hardware — will warn you when a signal becomes overloaded. If you want the CD to become the master, there can be no "overs." An over is commonly defined as three or more consecutive samples at a level of 0 dB fs.

• **Cutting A Reference:** Before getting into EQ, cut a flat reference and take a break. (Some of us spend an inordinate amount of time in ye olde control cave.) Go ahead, get out and see the world. Listen to your work in every possible environment — especially "the transitions" from track to track — and take notes!

• **Equalization Plus:** Some mastering engineers put the whole master through a favorite piece of gear that exudes such "character" (a euphemism for "pleasing" distortion) as to smooth out radical track-to-track differences. Sometimes this homogenization process is what characterizes the sound of a record.

If you can't "get it" with EQ and can't rent or own a vintage magic box, try using a multiband compressor/limiter such as the Aphex Dominator or TC Electronic Finalizer. Or, if your soft-/firmware supports plug-ins, check out the Waves C-1 (www.waves.com). [Check out the Waves Power Pack review on page 82.] In fact, being able to process high-frequency dynamics (such as de-essing) separate from the low and/or midrange frequencies can really smooth things out. It's sort of like audio multitasking.

• **The Final Tweaks:** The next reference CD you cut should be much closer to what the final product will be. Live with it for a while. If you're having trouble getting something close to professional results, it may be time to seek help. Now you know why mastering houses charge extra for client participation. EQ

World Radio History

Sound Forge Heats Up With ActiveMovie

Sound Forge 4.0, the award-winning digital sound editor for Windows, now supports ActiveMovie audio plug-ins. Sonic Foundry has selected ActiveMovie (a component of Microsoft's Interactive Media technology) as the foundation for the Sound Forge plug-in architecture. ActiveMovie plug-ins will be supported by a variety of audio software companies including Sonic Foundry and Waves.

Sound Forge also supports the ActiveX Streaming Format (ASF) – the new audio and video Internet and intranet streaming standard used by Microsoft's NetShow On-Demand.

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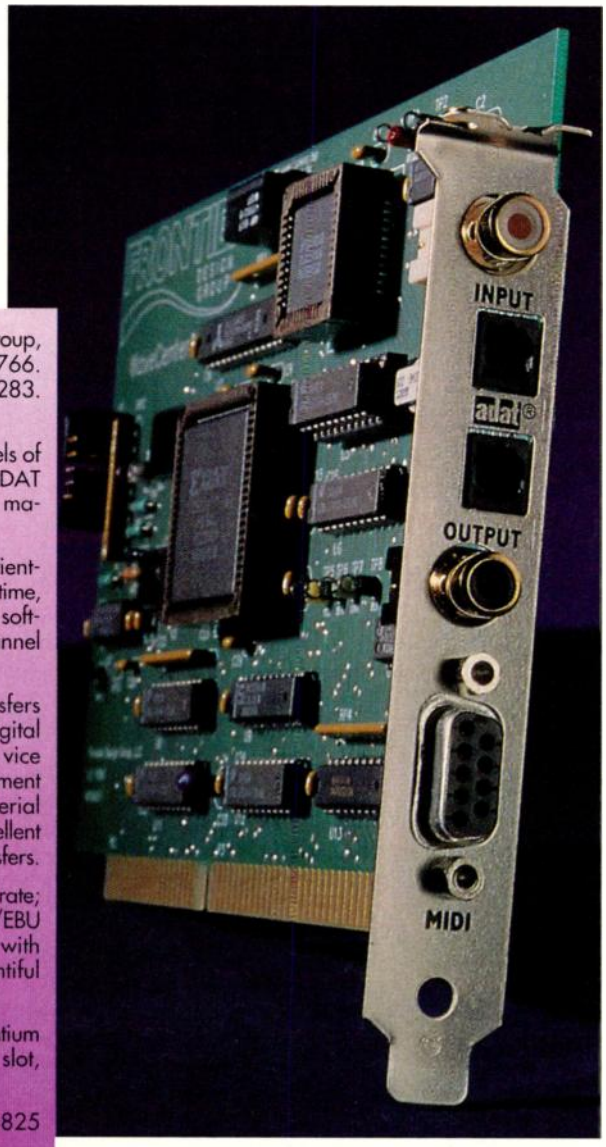
Frontier Design WaveCenter Digital I/O

Frontier Design provides a solid link between your personal computer and your ADAT

BY CRAIG ANDERTON

PC sound cards continue to diversify, specialize, and orient themselves more toward pro audio. Frontier Design's ISA slot-compatible WaveCenter provides multichannel, ADAT-compatible optical digital I/O along with S/PDIF optical, S/PDIF electrical (both usable simultaneously), and MIDI I/O with 1 in and 3 independent output ports. The ADAT and S/PDIF optical I/O share a pair of TOSLINK connectors; S/PDIF electrical uses RCA connectors, and the MIDI connectors require a special breakout cable (included) that hooks into a DB-9 connector. There's no analog I/O or on-board sounds, although there is a connector for a CD-ROM digital out; this is a digital-only affair. (Note: for DA-88 compatibility, use a format translator such as the Otari FC-24, Spectral Translator, or Apogee FC-8.)



Among other tricks, the WaveCenter can digitally transfer digital 8-track recordings to/from the PC, convert ADAT stereo pairs to S/PDIF (and vice-versa), translate electrical S/PDIF to/from optical S/PDIF, use ADAT as eight channels of A/D or D/A converters for hard-disk recording programs, and transform any ADAT-compatible output or input to S/PDIF. Although Alesis no longer makes the AI-1 for ADAT/S/PDIF/AES/EBU translation, the WaveCenter provides the same basic functions, as well as several enhancements (Kurzweil's DMTi box will also do the job).

MANUFACTURER: Frontier Design Group, 31 Old Etna Rd., Lebanon, NH 03766. Tel: 800-928-3236 or 603-448-6283. Web: www.FrontierDesign.com.

APPLICATION: Move multiple channels of digital audio, including direct ADAT support, to and from Windows 95 machines.

SUMMARY: A well-designed, pro-oriented sound card that's a bit ahead of its time, but should come into its own as more software programs implement multichannel recording and playback.

STRENGTHS: Easy installation; transfers ADAT-compatible multichannel digital audio; S/PDIF coax-to-optical (and vice versa) conversion; enhanced replacement for Alesis AI-1 interface; ignores Serial Copy Management System flags; excellent manual; supports 24- and 16-bit transfers.

WEAKNESSES: No 32 kHz sampling rate; no analog output for monitoring; AES/EBU interface not implemented; software with multichannel support should be plentiful soon, but is still scarce.

SYSTEM REQUIREMENTS: 486 or Pentium processor, Windows 95, 16-bit ISA slot, free IRQ, 16k of adapter space.

PRICE: $698 USA/Canada direct, $825 worldwide

EQ FREE LIT. #: 120

INSTALLATION

In a word: painless. Just follow the manual; all you need is an open IRQ (choices are 5, 7, 9, 10, 11, 12, 15) and 16k of adapter RAM — no DMA required.

THE SOFTWARE

The companion WaveTray application appears on the Taskbar (fig. 1). The little squares and dots use various colors to show the input/output status of the eight ADAT channels and two S/PDIF pairs. The three horizontal bars are essentially error indicators; clicking on the sync field (in this example, EXT) brings up the WaveTray menu.

USING & ABUSING

Currently, Saw Plus from IQS (Innovative Quality Software) can transfer eight tracks at a time during record or playback, and does so with sample accuracy if everything is recorded in the same pass. Samplitude Studio, the next best option, can record only a stereo pair, but can play back all eight tracks simultaneously. However, Cakewalk 6.0, Samplitude Studio 4.0, Cool Edit Pro, and several other programs are

World Radio History

slated to add multichannel capabilities soon.

Meanwhile, the WaveCenter looks like multiple stereo sound cards, so any application that uses standard Windows 95 multimedia drivers (Sound Forge, Cubase, Logic Audio, Cakewalk, etc.) can bring signals in and out as stereo pairs. Of course, like all other things digital, you must select the right sample rate and clock source, as well as select the appropriate driver in your hard-disk recording program.

Editing ADAT audio on hard disk and bouncing it back again to the same place requires deriving MTC from the ADAT (e.g., Alesis BRC or JL Cooper DataSync 2), and a program that can chase or trigger to MIDI Timecode. Saw Plus and Samplitude Studio can chase or trigger; Digital Orchestrator Plus, Sound Forge, and Logic Audio for Windows can trigger only. (Incidentally, Cakewalk Pro Audio defaults to chase, but you can make it "lock and release" by adding two lines to the AUDMM.INI file in the [Wave] section of the SYSTEM.INI file: SyncMaxErr=10000, and SyncDivisor=32000.)

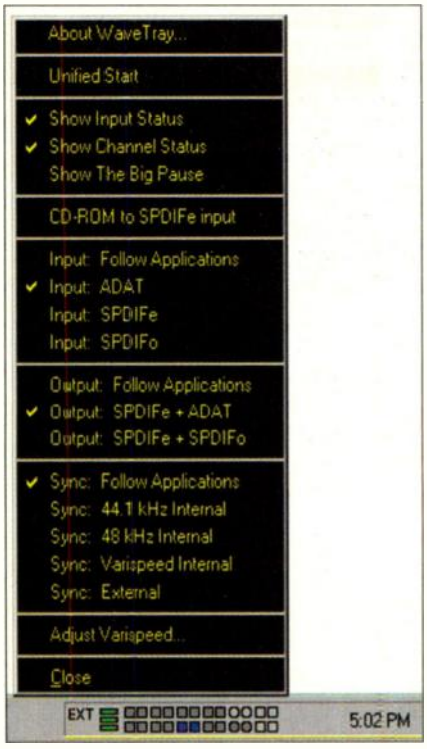


FIGURE 1: The WaveTray options menu.

With triggering, when the tape reaches a certain location, the trigger causes the program to start recording. When it's time to bounce edited material back into ADAT, the program will commence playback from the same location. Curiously, none of this is mentioned in the otherwise excellent manual, but is mentioned on their web site.

One workaround for multitrack recording uses Cool Edit, which can open up several "ghosts" of the same application. Call up Cool Edit four times, and record four sets of stereo pairs. The WaveTray software allows for playing or recording with all four windows at once. It's a cool trick, and requires a reasonably high-performance computer, but it'll do while we wait for more multichannel support.

IS IT WORTH IT?

The WaveCenter is intelligently engineered and adds more pro credibility to the PC. If you have Saw Plus and an ADAT, it's an excellent choice for an interface.

continued on page 151

CIRCLE 05 ON FREE INFO CARD

World Radio History

Waves Native Power Pack

Seven powerful plug-ins for a price that just can't be beat

BY DAVID MILES HUBER

Digital audio plug-ins have lately been sharing much of the hard-disk recording limelight, and for quite some time now, the folks at Waves have been a major player in the market due to apps like their award-winning C1 compressor/gate and L1 Ultramaximizer for the Mac. Recently, however, Waves has jumped onto the cross-platform bandwagon in a big way by bundling seven killer applications into a single package that includes such plug-ins as the Q10 Paragraphic Equalizer, C1 Compressor/ Gate, L1-Ultramaximizer, S1 Stereo Imager, TrueVerb, and WaveConvert. This package, which is known as the Native Power Pack, can be used with such Mac-based editors as Pro Tools 4, Deck II, Peak, and Steinberg's Cubase VST, as well as PC editors running on Windows 95/NT like Sound Forge 4.0a, Cakewalk Pro Audio, and Steinberg's WaveLab.

MANUFACTURER: us Waves, 6716 Central Avenue Pike, Suite 8, Knoxville, TN 37912. Tel. 423-689-5395. E-mail: waves@waves.com.

APPLICATION: Seven digital audio editor plug-ins and two stand-alone apps that perform a wide range of DSP functions for mastering, sound design, multimedia, and audio-for-the-Internet authoring.

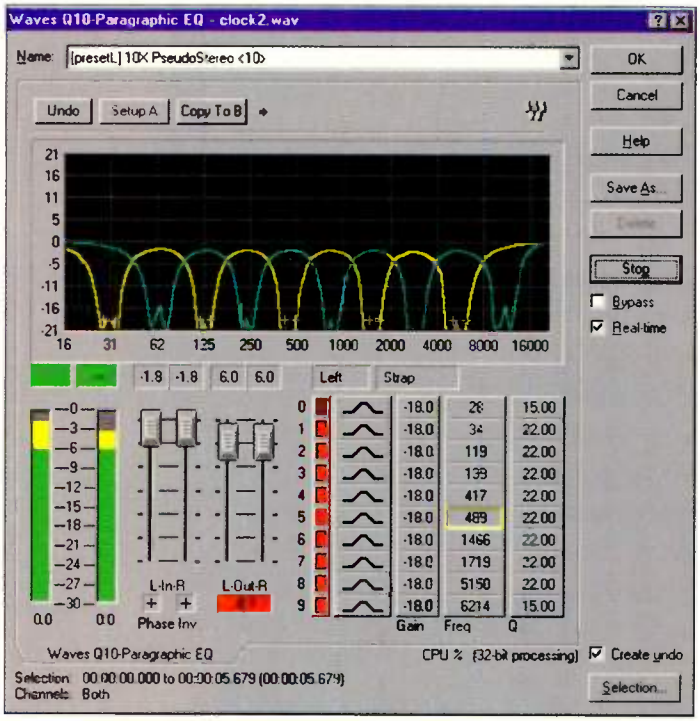
SUMMARY: A bundled series of high-end signal processing plug-ins for various audio editors on both the Mac and Windows 95/NT platforms.

STRENGTHS: Each of the plug-ins sound great; the mouse-driven graphic interface is simple to use and the online help makes it easy to get the job done; Audio Preview feature lets you hear an effect in real-time, before committing it to disk.

WEAKNESSES: The Pack comes on three floppy disks rather than on CD-ROM install disks; the extra disc space would've let them put the [Sonic Foundry] Sound Forge 4.0a update, real help file documentation, and the necessary ActiveMovie applications onto the disc (word has it that the next production batch will be on CD).

MANUAL: Manual? What manual? The install documentation (which in this case is critical) was virtually nonexistent. What documentation that I could figure out was written in html (the standard Web site programming language)...a bit bizarre! Fortunately, the help files are well written.

PRICE: $600
EQ FREE LIT. #: 121



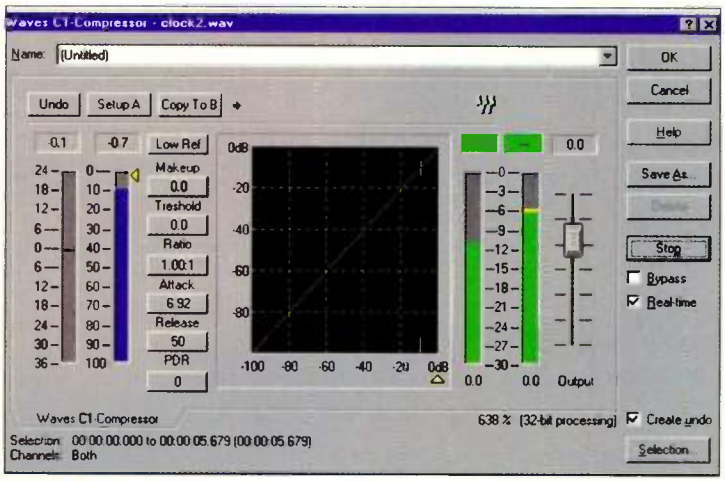


FIGURE 1 (top) and FIGURE 2: The Paragraphic EQ and C1 compressor/gate, respectively.

LEADERS OF THE PACK

The Q10 "Paragraphic" equalizer (see fig. 1) is a mono or stereo equalizer that lets you use the mouse to draw and tailor the up to ten bands of an EQ curve on screen. Controls for Frequency, Gain, and Q for each of the 10 equalizer bands, as well as overall metering and gain, are shown beneath the frequency curve display.

The Q10's controls allow for precise EQ contours, with frequencies being adjustable in 1/16-tone steps (96 steps per octave) and Q values (which determines the width of a filter's notch) of up to 100 being possible (to notch out specific frequencies, such as hum). Almost 200 EQ presets and processing functions are included within the Q10's setup library, and most of these can be user customized.

The C1 (see fig. 2) consists of two independent stereo processing modules: Compressor/Expander and Gate/Expander. The Comp/Exp module operates as a high- or mid-level compressor, with a gentle, soft-knee expander that can be "tuned" in real-time (when used with a powerful enough CPU) to maximize a program's

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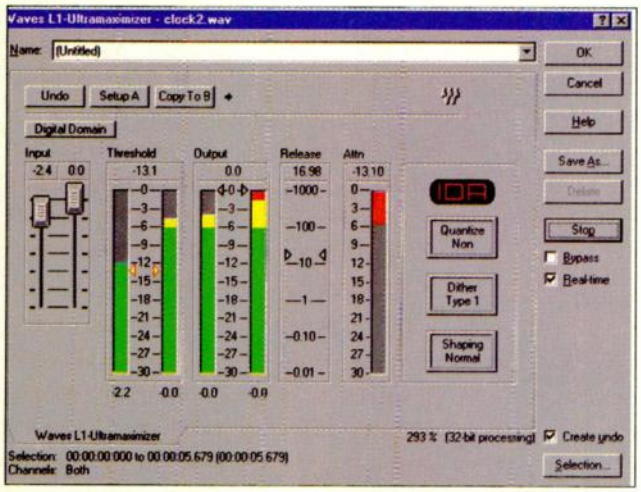

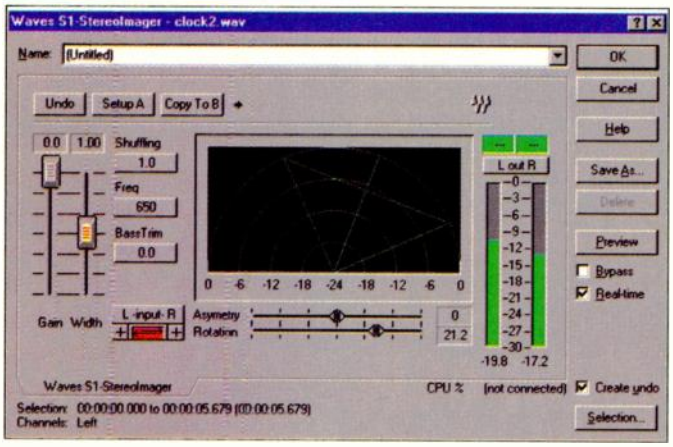

FIGURE 3 (top) and FIGURE 4: The L1-Ultramaximizer and S1 Stereo Imager screens, respectively.

overall signal gain. The gate/expander module can operate either as a fully featured expander or gate to "compress up" lower level signals. A unique PDR (Program Dependent Release) feature allows the release time to track the audio content and automatically vary with changes in the program.

The L1-Ultramaximizer (see fig. 3) is a sophisticated plug-in that combines an advanced peak limiter, level maximizer, and a high-performance requantizer into a single audio processing tool kit for mastering and digital editing applications.

Because a typical digital audio music file contains many high-intensity, short-duration peaks, simple normalization might still result in a low average signal level. Using the L1's "lookahead" peak limiter, it's possible to significantly increase the average signal level of a typical audio file without introducing any audible side effects. In addition, the implementation of Michael Gerzon's IDR (Increased Digital Resolution) noise-shaped redithering process makes it possible for the L1 to requantize digital data at all bit-depths, including the 24-bit to 16-bit conversions that are needed for all 24-bit and 20-bit mastering systems.

The S1 Stereo Imager (see fig. 4) expands the width and improves spaciousness of any stereo program material. It also can be used to adjust the center channel's imaging, relative to the stereo image, as well as being a handy-dandy MS stereo matrix processor.

The most noticeable feature of the interface is the stereo vector display, with its half-circle shape and soundstage graphic that shows you where the original left, center, and right sounds are positioned in the processed stereo field, while indicating their relative balance levels. In addition, a "shuffling" feature can increase the overall stereo width at bass frequencies, which makes the stereo image sound more spacious. Unlike other software systems that use this feature, it's fully phase compensated (i.e., doesn't cancel out when played back in mono). Channel Polarity and Channel Swap buttons are also included to cope with situations where the phase and channels have been accidentally reversed.

The TrueVerb plug-in (see fig. 5) is a virtual room/reverb that offers control over room size and room response characteristics, as well as a unique processor that varies an instrument's perceived miking distance.

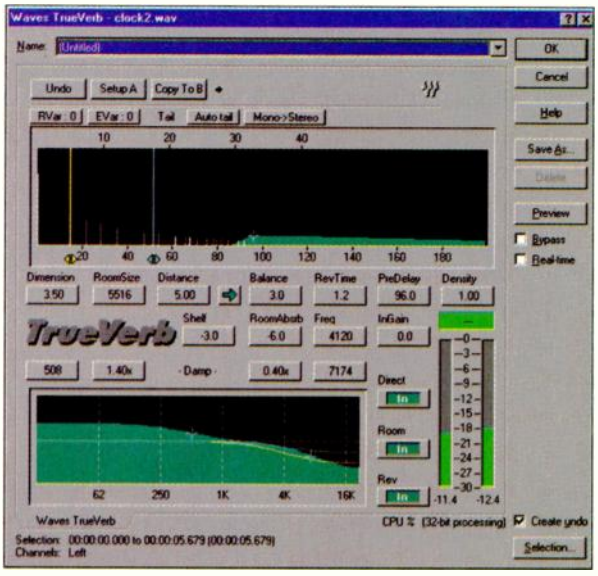

FIGURE 5: The TrueVerb Plug-In.

TrueVerb's bottom window is a frequency response graph that shows the reverb's frequency "contour," the RevShelf, and the RoomAbsorb (a display that simulates the absorption characteristics of a real room's surface), while the top window shows a time response graph, room size, distance to source, the early reflections, predelay, reverb tail, and various relative levels.

The WaveConvert batch file processor/converter is used to automatically limit and/or convert the sample rate, bit rate, and soundfile type of any number of soundfiles at any one time, using a single batch command. Unlike the other plug-ins, WaveConvert is a fully functional program that can be used independently without having to run from within a host editor. Some of the conversion features include: file-type conversion (WAV, AIFF), sample- and bit-rate conversion, stereo/mono conversion, normalization, EQ, and noise gating.

INSTALL WOES

On the doggie-downer side, the single instruction sheet that comes in the box hardly says jack crap about the installation requirements, which for certain editor packages, is critical. So, I'll fill you in on some insider tips: For those of you who are wanting to use Power Pack with Sound Forge, make sure that you've loaded version 4.0a (a recent update that includes several improvements and supports Microsoft's ActiveMovie plug-in architecture) into the system. Don't even try to load it into Forge 4.0! For all of the supported Windows edit packages, you'll also have to make sure that the ActiveMovie apps have been loaded onto disk

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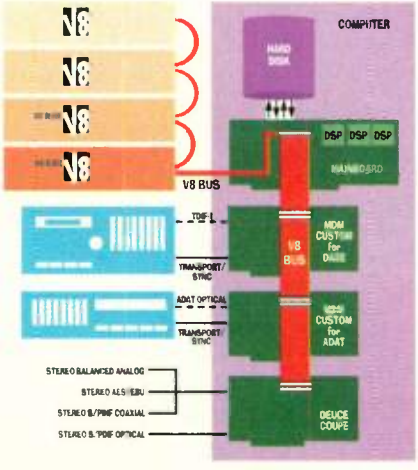
Start Your Engines.

It's time for a complete studio overhaul. The new Digital Audio Labs V8 multitrack digital audio platform rules the road with more channels, more DSP horsepower, and more I/O options than systems twice the price. And, since the PC based V8 system will support application and DSP software from all your favorite audio editing and MIDI sequencing companies, you already know how to drive it!

Under The Hood

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



The V8 Audio Gearhead Partners; Your Interface to the V8 System

With the V8 System, there's no new proprietary software to struggle with. Simply mix and match any combination of powerful applications and DSP plug-ins from our ever growing list of Audio Gearhead Software Partners to create your own custom tailored workstation. Look for the Audio Gearhead Approved seal on your favorite audio and music software, your assurance that the software is fully V8 enabled.

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(both the 4.0a and ActiveMovie files can be downloaded free of charge from the www.sfoundry.com site.)

For those of you who already have other Waves non-ActiveMovie plug-ins for Windows (such as AudioTrack or the L1), you may have to reload them again, as the Power Pack install kicked 'em off my hard disk...frustration city! But wait, folks, I'm not done yet! The hardware protection key (a.k.a. dongle) that plugs into the printer port won't pass data to my 8Port/SE MIDI interface. To get around this snag, I've had to rig up a switchbox to accommodate the dongle's unfortunate dangling-tangle. Oh yeah, WaveConvert will require that you enter a serial number that's provided on the box; however, I've tried the number several times with no success. Hey guys, don't you trust this face?

FROM THE TEST BENCH

Besides the fact that the Power Pack is cross platform and supports Microsoft's new ActiveMovie architecture (which makes the plug-ins available to any Windows program on your system that supports ActiveMovie), one of the biggest bonuses about the Native Power Pack is the price. In the not-so-distant past, the price of either the C1 or L1 plug-in alone was nearly the price of this entire package.

The sonic quality of each plug-in is simply superb! The ability to audition snippets of previewed audio lets you hear your changes in real time (a big and rather new bonus for us PC folks), and once you've gotten the settings that you like, you can check it against the original soundfile by using the bypass button...and save the file to disk.

In my book, honorable mention goes to both the S1 Stereo Imager and to TrueVerb. Unlike other Windows-based stereo spatializer plug-ins that increase a program's spatial width by putting the signal out-of-phase, signals processed by the S1 won't disappear when listened to in mono. Big thumbs up! In addition, TrueVerb's overall reverb quality has to be heard to be believed. Its decay, reflection and dispersion characteristics hold up to any of the 'verb boxes I've ever heard, regardless of price. Rich and creamy are words that come to mind.

ALL IN ALL

Once you've passed the install hurdle (hey, maybe you'll have better luck), you'll find the Power Pack to be a really powerful and useful collection of effects tools that, only a short while ago, would've cost a small fortune. EQ

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CIRCLE 85 ON FREE INFO CARD

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Emagic Zero-loss Audio Packer

Emagic finds a way to shrink audio files without sacrificing quality

BY CRAIG ANDERTON

"Space is the place," as Sun Ra once said, and storage space becomes more problematic as we accumulate more and more digital audio files. Removable cartridge drives and DAT backup help, but it would be nice if files just didn't take up so much blasted space in the first place (and don't even mention downloading a decent-sized 16-bit, 44.1 kHz stereo file from the Internet). Generally, though, standard compression packages aren't optimized for digital audio; for example, using Stuffit generally saves only about 10% (at least in my experience).

Now Emagic has launched ZAP, a Mac/Windows compression utility (the Mac version is reviewed here). It claims to reduce digital audio file sizes by 20% to 60%, and it actually does.

ZAP wants at least a 68020 processor, System 7.0, and 1.5 MB of free RAM. The program supports Sound Designer II (mono or interleaved stereo), AIFF (mono or stereo), and WAV (mono or stereo) 16-bit file formats. Forget 8-bit or data-compressed files.

Installation follows standard disk copy protection procedures — "authorize" your hard disk so the program works only on that disk, and de-install to regain an authorization. There are two installs in case your hard disk crashes.

Using the program is simple. Launch it, then open the file to be zapped (or just drag-and-drop on the program icon). A status screen appears with the estimated processing time, percentage of space saved, and the before-and-after file sizes. On 68K Macs, processing can take a while — up to 24 minutes for a typical pop tune on an 030 machine. A Power Mac moves dramatically faster on all types of files.

You can also create an archive of files, which is treated like one big file. This is helpful if you want to telecommunicate, for example, a collection of files to a friend. Even better, you can create a self-extracting, .sea-type file. This requires about 30k more than a non-self-extracting file, but the recipient does not need ZAP to decompress it.

Although it may appear you can't save a zapped file to a drive other than the one it's on, going into Preferences and checking "collect all items in one archive," then "choose archive name before zapping," allows rename and "save as" functions.

I tested ZAP with several file types; the more unpredictable and complex the material, the longer the processing time and the lesser the memory savings. For example, a TR-808 snare was reduced by only 13 percent, and program material averaged around 20 percent. Narration went from 30–40 percent, depending on the amount of background ambience, and samples were cut by around 40–50 percent.

The most compression came with an individual guitar track on a multitrack recording: it had lots of silence when the lead wasn't playing, resulting in savings of 63 percent. While ZAP's ability to cut 20 percent off program material can be useful, I think the real value lies in backing up multitrack hard-disk recording data. Many times, such data contains material that can be drastically compressed.

There's nothing too sexy about a data compression program, but being able to cut storage requirements puts a lot less strain on your available disk space. If you save one Jaz cartridge's worth of data due to ZAP, the program has paid for itself. EQ

MANUFACTURER: Emagic, 13348 Grass Valley Ave., Grass Valley, CA 95945. Tel. 916-477-1051.

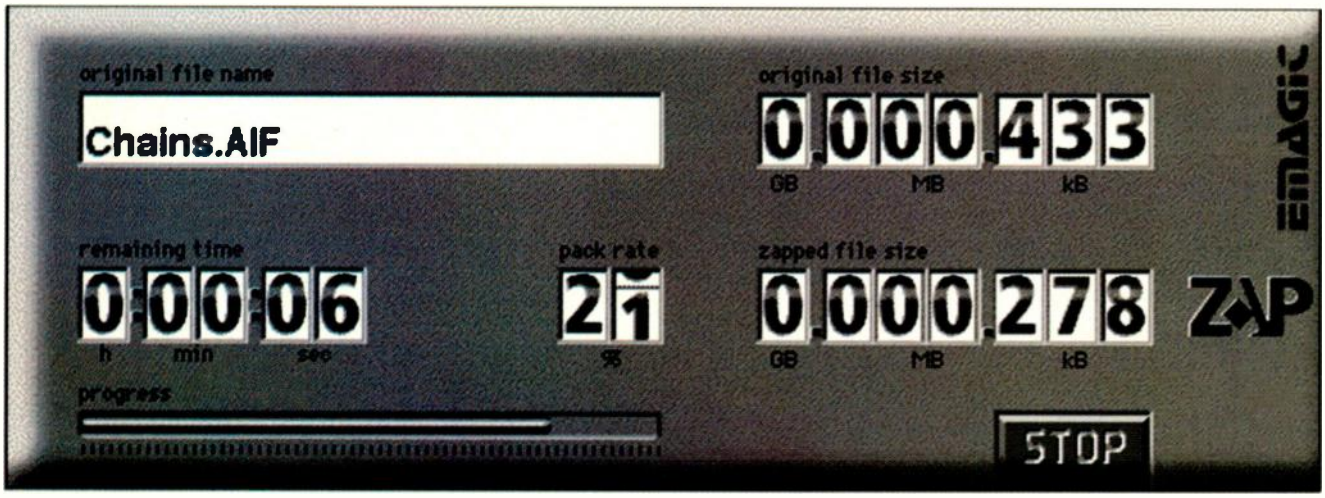
APPLICATION: Provide lossless audio file compression to save storage space or transmission time when telecommunicating files.

SUMMARY: Does what it claims and, over time, can pay for itself.

STRENGTHS: Works with 68K and PowerPC-based Macs; easy to use; can create self-extracting files; lossless compression scheme avoids audio degradation; can convert multiple files at once.

WEAKNESSES: Copy protected; memory savings depend on material being compressed; zapping some files may not be worth the effort.

PRICE: $99 **FREE LIT. #:** 122



The ZAP window shows the status of the packing procedure, the original and packed file sizes, the amount of savings, and the file name.

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MD

The comeback of the MiniDisc within the pro-audio world seems to have some staying power, with three industry heavy-hitters releasing mini-studios offering plenty of bang for the buck. But which model is right for you? Craig Anderton reviews the new TASCAM and Sony models, and brings it all together with a comparison between these two and the Yamaha model (reviewed in the October '96 issue.)

World Radio History

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MD mildness

TASCAM 564 Digital Portastudio

TASCAM's MD mini-studio entry keeps the musician in mind

BY CRAIG ANDERTON

The TASCAM 564 feels like it was designed for multitracking musicians instead of being a more general-purpose, or hobbyist-oriented, product. While the 564 can play back MD audio disks, it records exclusively in 4-track mode (the other multitrack MDs record in stereo and mono too). The 564 allows five songs per disc as opposed to the competition's 250+, but given the multitrack emphasis, this makes sense since with 4-track MD recording there's only 37 minutes available anyway (and even less if you leave about 15 minutes open as a "buffer" for edit operations).

This box is pretty easy to figure out. All jacks are accessible from the top, and the manual is solid: there are tutorials for those who are new to the game, block and level diagrams, and a complete reference section with many step-by-step, fully illustrated examples of how to perform specific tasks. The only thing lacking is an index.

OPERATIONS CENTER

Recording is very simple; the 564 goes for a strict stereo paradigm as opposed to 4-bus operation (although you can record four inputs at once by feeding them direct into the MD). The first track's length sets the song length, which can only be changed by creating a playlist of sections of the song longer than the song itself, copying this to create a new song, then recording over the regions you want to extend.

Tracks 1 and 3 can be set to direct input, safe mode, or left bus. Two and 4 are the same, except they feed the right bus. Transport controls are Stop, Play, Record, a jog/shuttle wheel, and 20 namable "index" points, which can be used for autolocation as well as to mark different tune sections for cut, paste, copy, and playlist operations. The jog wheel steps through the index points and (thankfully) plays looped audio during the jogging process; when using the shuttle wheel to "fast forward" and "rewind" (from 2X to 32X normal speed depending on the wheel rotation), you hear audio snippets if the unit is already playing.

You can also return to zero, to the previous point where recording was initiated (good for checking overdubs), repeat the material between any two index points, or repeat for up to 9.9 seconds starting at any index point (with a programmable pause up to 9.9 seconds before returning to the beginning). However this can't be used for tight looping; even with no programmed pause, there can be a noticeable gap. It makes more sense to use the playlist option for repeats.

You must save the disc's Table of

EQ LAB REPORT

MANUFACTURER: TASCAM, 7733 Telegraph Rd., Montebello, CA 90640. Tel: 213-726-0303.

APPLICATION: Integrated 4-channel recording studio for songwriting, demos, broadcast, multimedia, and theater use.

SUMMARY: As the most "musician-oriented" of the current 4-track MD recorders, the 564 costs more, but justifies the expense.

STRENGTHS: Sweepable midrange EQ; very effective jog/shuttle wheel; many undoable functions; select one of up to five takes per punch; MTC and MIDI clock sync (MIDI clocks track varispeed changes); bounce forward and playlist functions are well-implemented; pleasing ergonomic design.

WEAKNESSES: As with other MD machines, bouncing does not occur digitally; MD media is difficult to back up; tempo maps restricted to 1 BPM changes; edit operations apply to all four tracks at once, not individual tracks.

PRICE: $1499 **EQ FREE LIT. #:** 123

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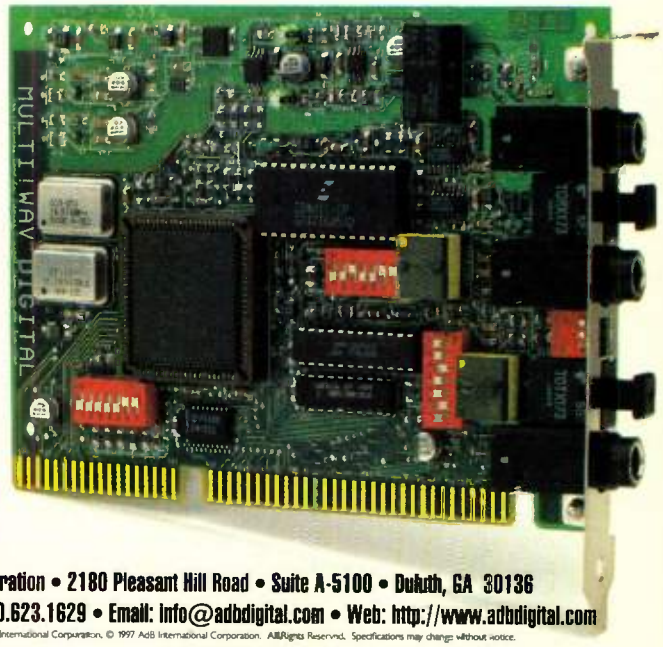

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Contents periodically, but there's no "Save" button — either eject the disc (which means popping it back in again), or switch to a different song. However, the TOC updates automatically when you go from one edit operation to another, so there's never more than one edit in the buffer.

EDITING

You can delete the range between two index points, move one section so that it slides in between two other sections, or copy a section to duplicate it elsewhere in the tune.

Playlists can be up to 99 steps, and the transitions are seamless. Index points are trimmable within a little under ±6 ms, which does the job. The playlist reflects any index point editing; you can also insert and delete steps. While not as precise as using hard-disk editing, the 564 implements playlists very well. Bouncing the revised version forward creates a new song.

Punching is particularly cool. You can do it in real time (buttons or footswitch) or automate the punch between two index settings — either mode allows pre- and postroll for rehearsal. Best of all, you can record up to five different takes per punch, then select one as the "keeper."

Undo/redo is available for overdubs, manual punching, index clear, move and erase editing functions, song erase, and disc erase; you can't undo automated punches or the initial (non-overdub) recording, but that's not a real issue since TASCAM instead implemented the more useful option of being able to do multiple takes per punch. Although the copy editing function is not undoable, you can just erase the copy as a workaround.

The "bounce forward" feature mixes all four tracks down to one or two tracks (through the analog mixer) to a new song, and you can overdub while bouncing. This is different from the Yamaha MD4 and Sony MDM-X4, where you must first copy the song before adding overdubs. Since bounce forward retains older versions of songs, if you blow a premix you can return to the previous version and start over. However, you can only bounce forward four times before hitting the disc's five-song limit, at which point you need to erase older versions. As expected, you can't bounce forward if there's not enough free disc space.

The 564 also has a "black out" feature that stops playback at any point without disturbing what comes afterward — useful if you want to try out different tune endings.

MIDI WORLD

Sync a sequencer to the 564 for a lot more tracks. The 564 outputs MTC (24, 25, or 30 frame, drop or nondrop) or MIDI clocks with Song Pointer, and responds to MIDI Machine Control stop, deferred play, and locate commands. Tempo maps allow time signature changes every bar, and tempo changes (with 1 BPM resolution) every 1/4 note if desired; there can be 32 changes per song, and 96 maximum for the disc. There's no tap tempo, so set up the map before you start recording any digital audio.

Changing pitch (up to ±9.9% in 0.1% increments) changes the song's tempo too. MTC and MIDI clocks track any changes, even if you change pitch or return to normal pitch while the song is playing.

OVERALL

The 564 gets very high marks. Its musician-friendly approach, quality sound, and "bonus" features such as multiple takes and bounce forward put it in a class by itself. Speed of operation is also a major issue: the 564 spends very little time processing data. This is also important for bouncing forward, as you can interrupt in the middle of the process if something's wrong (like you miss bringing up a fader). With other MD multitrack machines, you have to copy first, and if something is wrong, wait until the copy is complete before making another attempt. The 564 may be the most expensive of the MD recorders, but use it for a few days, and you'll see why. EQ

THE 564'S MIXER

The 564 mixer sports several key features compared to other machines: more inputs (and the option to feed in virtual tracks while monitoring MD tracks), a pair of insert jacks, mixdown deck input, digital output, two simultaneously available aux sends, and sweepable midrange EQ.

Main Inputs: XLR and 1/4-inch phone (mic/line; only one usable at a time) for input channels 1–4. Stereo inputs 5/6 and 7/8 have dual 1/4-inch inputs that feed their own input channels (the fader, EQ, etc. affect both channels simultaneously). Stereo inputs 9/10 and 11/12 go directly to the L/R bus and have only individual volume trims (they're ideal for effects returns).

Insert Jacks: Post-EQ, prefader TRS 1/4-inch phone jacks for channels 1 and 2.

Input Channel 1–4 Controls: Gain trim (up to 65 dB), input switch for line/mic input, MD track, or both (MD is main source, but inputs go directly to bus through trim control). Four EQ controls (high shelf @ 12 kHz, ±12 dB; mid sweep 250 Hz to 5 kHz, ±14 dB; low 80 Hz, ±12 dB), 2 mono aux bus sends, pan, 44-mm fader.

Input Channel 5/6 and 7/8 Controls: Same as 1–4 except no trim or midrange EQ, pan is replaced by balance for stereo signals (using one channel of the stereo pair for mono changes this back to pan), and the assign switch selects among main stereo bus, off, and cue.

Input Channel 9/10 and 11/12 Controls: Level, assign switch selects among main stereo bus, off, and cue.

2-TR Input: Output section can listen to this for monitoring, for example, mixdown deck outs.

Output Section: Master monitor level, 2 master effects sends, 60 mm master fader, cue mix section with cue master control, level controls for all four MD tracks, and monitor select switches for left, right, cue, effect send 1, effect send 2, and 2-TR in.

Output Jacks (1/4-inch phone): Two effects sends outs, cue out, headphones.

Output Jacks (RCA phono): Stereo main bus out, 4 MD track outs, stereo monitor out.

Digital Output: S/PDIF from main mixer bus.

MIDI: In, Out, and Thru (5-pin DIN)

Punch Footswitch Input: 1/4-inch phone jack

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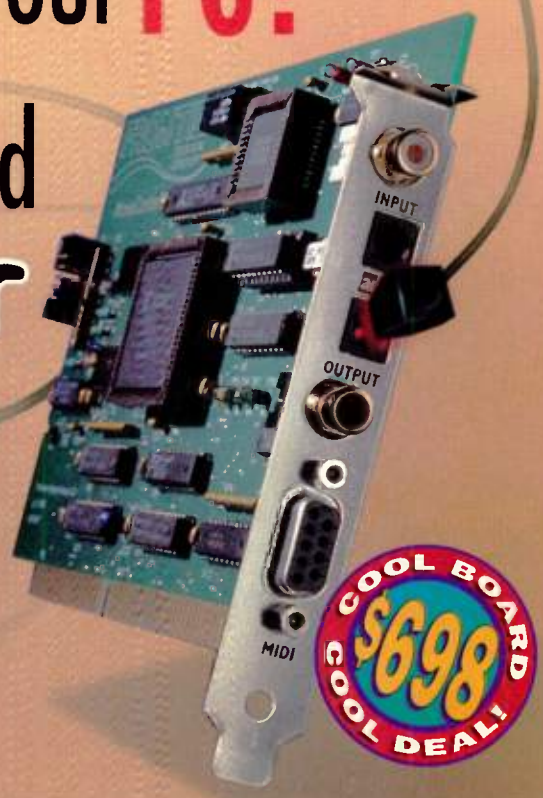

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MD madness

Sony MDM-X4 MiniDisc Recorder

The inventor of the MD comes out with a mini-studio of its own

BY CRAIG ANDERTON

Considering buying a 4-track cassette deck? Check out the alternative: MiniDisc-based 4-track recorders offer superior sound quality, more robust storage medium (optical-based), cut and paste editing options, the ability to bounce into already recorded tracks, built-in MIDI sync (which doesn't require giving up a track) for teaming up with a sequencer, and no rewind or fast forward times. The main disadvantage is price — not only do MiniDisc (MD) recorders cost more than cassette equivalents, blank MD Data discs list for around $30 each (when you can find them). But if you have the bucks, MD-based multitrack recorders leave cassettes in the dust.

Sony's MD multitrack entry, the MDM-X4, is a "desktop studio" that integrates an analog mixer with a MiniDisc storage medium. Although the MDM-X4 uses MD Data discs to record up to 37 minutes of 4-track material, it can also accept standard MD Audio discs for recording and playing back 74 minutes of two-track material, or 148 minutes in mono.

TRANSPORT TIME: BEAM ME UP

The mixer is a pretty conventional analog mixer (see sidebar), so let's jump into recording with the MDM-X4.

It's not much different from cassettes: you record enable individual channels, have record and play buttons, and create up to 11 markers for autolocation. Two of these markers, In and Out, set the area affected by editing operations.

You can also do block repeats between in and out points; there's still a gap when it returns to the beginning, but it sure beats tape. Other keys autolocate to the beginning of the current song, previous song, or next song, or enable repeat functions — just one song, or all the songs on the disc. There's no rewind or fast forward; instead there's the jog wheel, which moves you expeditiously through the tune and navigates the editable parameters.

A "rehearsal" mode enables practicing a take without actually recording. It's also great for setting locate points, as a temporary volume shift occurs at the locate point to emphasize the point's transition. If you're cutting audio, this helps find the best splice point, although you're restricted to single-frame accuracy.

The MDM-X4 is straightforward. There's a nice ergonomic feel (as befits a "sketchpad" recorder, all jacks except MIDI and master/monitor outputs are accessible at the top of the front panel), and while compact, it doesn't feel cramped.

The manual is effective, although absolute beginners will need outside help to fully grasp how recording and MIDI work. Those with a general familiarity of multitrack recording should have no trouble.

The MDM-X4 outputs MTC (25 or 30 frame, nondrop) or MIDI clocks with Song Pointer, and responds to MIDI Machine Control commands so it can serve as an "intelligent peripheral" for your sequencer. In fact, if your computer lacks the needed resources for a MIDI + Digital Audio program (fast hard drive and processor, plenty of

EQ LAB REPORT

MANUFACTURER: Sony, 3 Paragon Dr., Montvale, NJ 07645. Tel. 201-930-1000.

APPLICATION: Four-channel recording studio for "audio scratchpad," demos, broadcast, multimedia, and theater use.

SUMMARY: Relatively easy to use, the MDM-X4 is further evidence that the analog cassette's days may be numbered as a multitracking medium.

STRENGTHS: Jog/shuttle wheel; audio and data MiniDisc compatibility; MIDI timecode or MIDI clock sync output (with tempo map); responds to MIDI Machine Control; editing operations can apply to individual tracks, not just sections, and occur in the digital domain; pitch change parameter; 3-band mixer EQ.

WEAKNESSES: Track bouncing is done via analog mixer, not digitally; difficult to back up disc; MIDI clock out does not follow pitch control changes (although MTC does); tempo maps restricted to 1 BPM changes.

PRICE: $1250 **EQ FREE LIT. #:** 124

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RAM, etc.), slaving the MDM-X4 to provide some digital audio tracks can be a cost-effective workaround.

Using MIDI clocks allows up to 50 tempo maps (although you'll run out of memory space to hold tempo map information if you use a lot of them in your songs). Tempo maps should be set up prior to recording; there's no "tap tempo" feature to reconcile the map with your playing after-the-fact. Tempos are precise to 1 BPM.

Speaking of tempo, the pitch control (±8% in 0.25% increments) is not a "stretch" function; i.e., raising pitch increases the song's tempo, and lowering pitch slows the tempo. If you sync a sequencer to the MDM-X4 using MTC, the sequencer will follow the tempo change caused by pitch-shifting. However, MIDI clocks are constant regardless of the pitch control; if you're using MIDI clocks to provide virtual tracks, you're okay as long as you don't change pitch.

EDITING

Automatic punch in/out works like a regular recorder, although there's a pre/post roll time of 1 to 10 seconds in rehearsal mode (for example, with a 2-second setting, the MDM-X4 starts playing 2 seconds before the punch-in point, and continues for 2 seconds after). The punch can be programmed or done manually.

The best aspect of punching is that you can undo and redo it. If you didn't get the punch points right, no problem; just hit Undo. As with other MD multitracks, you can bounce audio into existing channels of audio, but that's not undoable — copy the song later on the disc as a "safety," just in case the bouncing doesn't turn out right.

Track editing is very cool. You can copy, move (insert), or delete any portion of any track, or exchange two different areas of any track (whether in the same song or not). All of these operations also apply to entire sections of a tune (i.e., all four tracks at once), and are undoable.

The same operations can apply to complete songs, too, but there are two more options: song divide (splits a song into two parts) and combine (adds two songs together). Interestingly, you can't punch in/out on songs that were combined; you have to copy the combined piece to create a new song. Essentially, these editing options are an indirect method of playlist creation.

The song operations (except delete) are undoable, because they all leave the original material intact. However, you can't just hit the Undo button; you must go back and rearrange the material (e.g., if you moved a song, you have to manually go in and move it back).

You can even put together collages of loops by copying, moving, etc., although this is much more tedious than working with a computer-based system because of the MD's processing time, and the time it takes to set the in and out points precisely. If you're doing dance remixes, stick to hard-disk recording. For less intense editing, the MD works fine.

The footswitch option is helpful. There are two footswitches, each assignable to one of the following functions: play, punch in/out, stop, block repeat playback, toggle playback (press once to play, once to stop), and toggle record (press once to record, once to stop).

Quality sound, smooth operation, editing functions...it all sounds great. But the one problem with MiniDisc is that it's hard to back up. Backup is important, because as the manual states, if power is turned off while recording, you may not only lose the current song data, but all data on the disk. I tried this a few times; I wasn't able to dump the whole disc, but with a little effort could screw up the song being worked on enough to be unusable. If you live where power outages are common, better invest in a UPS (uninterruptible power supply).

But this is a limitation of all MD-based multitrack recorders. Overall, the MDM-X4 is a well-rounded combination of simplicity and functionality; it beats the cassette equivalent in almost every respect, and holds its own against the current competition. If you're looking to record four digital tracks in a portable studio at a midrange price point, the MDM-X4 proves that you can go pretty far with a MiniDisc. EQ

ABOUT DATA COMPRESSION

Recording 148 track-minutes of 44.1 kHz, 16-bit audio requires over 700 MB of storage space, but data MDs only hold 140 MB. Using data compression reduces storage requirements, but unlike computer programs that compress and decompress back to their original form, the ATRAC compression algorithm used in MD is lossy — it discards information deemed unnecessary.

Although compression affects the sound, ATRAC continues to evolve and improve. Compression can become noticeable when doing multiple bounces of the same material; bounce a recorded track several times, and on the third bounce, you just start to hear ATRAC modulating the highs a bit. Bottom line: the sound is almost as good as DAT, and light years ahead of cassettes.

THE MIXER

The mixer is fairly conventional; here are the details.

Main Inputs: Two XLR+1/4-inch phone and two 1/4-inch phone jacks feed input channels 1–4. Stereo input 5+6 has individual 1/4-inch inputs that feed another input channel (the fader, EQ, etc., affect both channels simultaneously)

Input channel 1–4 Controls: Gain trim (up to 40 dB), source switch for line/mic or MD track playback, 3 EQ controls (±15 dB; high 15 kHz, mid 2.5 kHz, low 50 Hz), mono aux bus send (center position gives no send; clockwise sends more signal to Aux 2, and counterclockwise more signal to Aux 1), pan, bus assign switch (1+2 or 3+4), 60 mm fader

Input Channel 5 + 6 Controls: High and low EQ, bus assign switch, balance control, 60 mm fader

Effects Returns: Two stereo returns, also usable as two mono returns with 1/4-inch jacks

Effects Return Controls: Level and stereo bus assign switch

Output Jacks (1/4-inch phone): 4 MD track outs, two aux out, headphones

Output Jacks (RCA phono): Monitor out, main stereo bus out

Output Section: Master fader and monitor section with monitor level control, level controls for all four MD tracks, and monitor select switches for busses 1+2, 3+4, the recorder tracks (cue), or main stereo bus

MIDI: In, Out, and Thru (5-pin DIN)

Footswitch Inputs: Two 1/4-inch phone jacks

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Audix Studio 1A

SPECIFICATIONS

frequency range	*50Hz-18kHz (± 3dB)*
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MADE IN USA

MD madness

The Big **Wrap-Up**

What the three MD studios mean to us

BY CRAIG ANDERTON

First came the Yamaha MD4 (reviewed in the October 1996 issue of *EQ*), then the Sony MDM-X4, and now TASCAM's 564. At this point, the strengths and weaknesses of the MiniDisc multitrack format, regardless of machine, are pretty well-known: they're simple and fast to use, and despite data compression, the sound is far superior to analog cassette multitracks—if you do get a "magic take," the sound quality is good enough for prime time. Other plusses include cut-and-paste editing, playlist options for re-sequencing different tune sections, built-in MIDI sync that doesn't use up a track, and the ability to bounce into existing tracks.

The downside: While MiniDiscs are extremely durable, you can't back them up (even more problematic is the fact that if power goes out while recording, you could lose a song, or possibly all data on the disc). Also, data-type MiniDiscs are hard to find and cost around $30 in single quantities. Still, for those who want painless digital, the combination of ease of use coupled with high sound quality underscore why MD multitrack recorders have captured the musician's attention.

The main question: Should you go for the Yamaha MD4, Sony MDM-X4, or TASCAM 564? My take is that the Yamaha and Sony are the more consumer-oriented models, designed for those who like MiniDiscs and want to branch out into hobbyist or semi-pro recording. Both units hedge their bets by offering compatibility with audio MDs, and listing for about 20 percent under the 564. However, the MDM-X4 has one mondo unique feature: the ability to apply editing operations to individual tracks (even those in different songs), not just entire sections. This feature alone might be enough to put some musicians in the Sony camp. Unfortunately, unlike the 564, its MIDI clock sync does not follow pitch changes.

The 564, which seems designed from the ground up as a multitrack machine for musicians (according to TASCAM, it also uses a custom-designed MD drive optimized for multitracking), throws in a lot more features — and faster operation — for the extra $300 or so. The bounce forward feature is wonderful (the MD4 and MDM-X4 can do something similar, but in a more time-consuming way), playlists are seamless (and with 99 steps — far more than the 9 offered by the MD4, or the MDM-X4's divide-and-combine approach), having up to five alternate takes per punch is fabulous, and the mixer has an edge over the others thanks to sweepable mid-EQ, more inputs, and S/PDIF digital out.

Digital Out may seem like a gimmick; if you're mixing to something like DAT, it's only worth using if you think the A/D converter in the 564 beats the DAT's A/D converter. Where it is useful is mixing down to a computer program. More and more personal computer interfaces have S/PDIF I/O, which means you can bypass all the noise problems of analog sound cards just by going digitally into the computer.

MD multitrack machines in general are relatively costly to run; include the cost of 20 MDs, and you've just added another $600 to the price. Yet economics isn't everything. Although four extra tracks is enticing, tape tends to be more trouble-prone, and the entire setup is far less portable. Also, tape can't do any of the editing an MD-based machine can do, let alone put together playlists.

Of the three existing MD multitracks, the short-form summary is this: if your budget is really tight and your interest in music is casual to semi-pro, the MD4 and MDM-X4 are a coin toss, with the MD4 having slightly better-sounding mic preamps and the Sony having the per-track editing options. If you're serious about your music, and are willing to pay the extra cost, the 564 is the most musician-friendly of the lot. **EQ**

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Create killer vocals

Jon Anderson/YES

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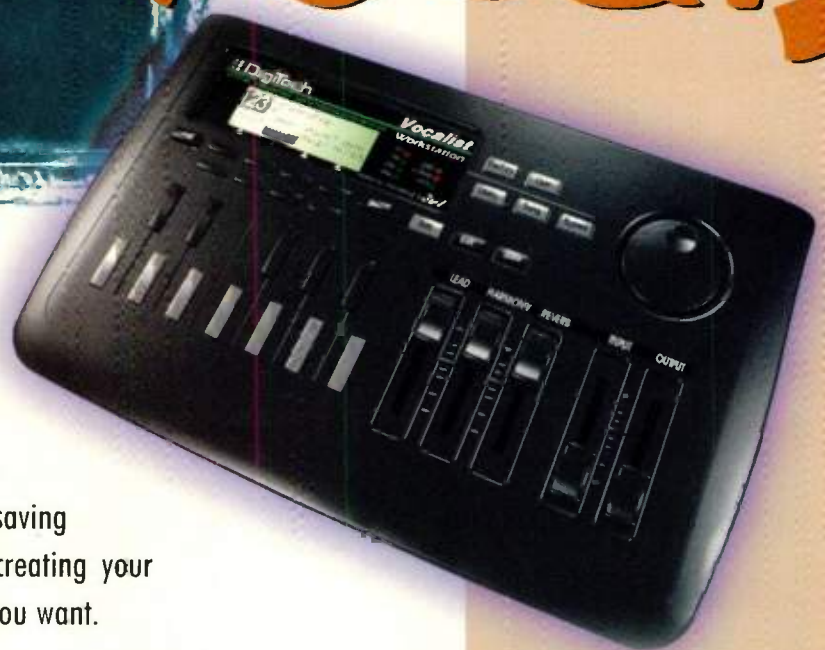

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EQ LIVE

Ear mixing 101

Your guide to getting the most out of personal monitors and how to handle the talent that uses them.

By JP Armstrong

New Gear
Page 116

EAR PHOTO COURTESY OF SENSAPHONICS

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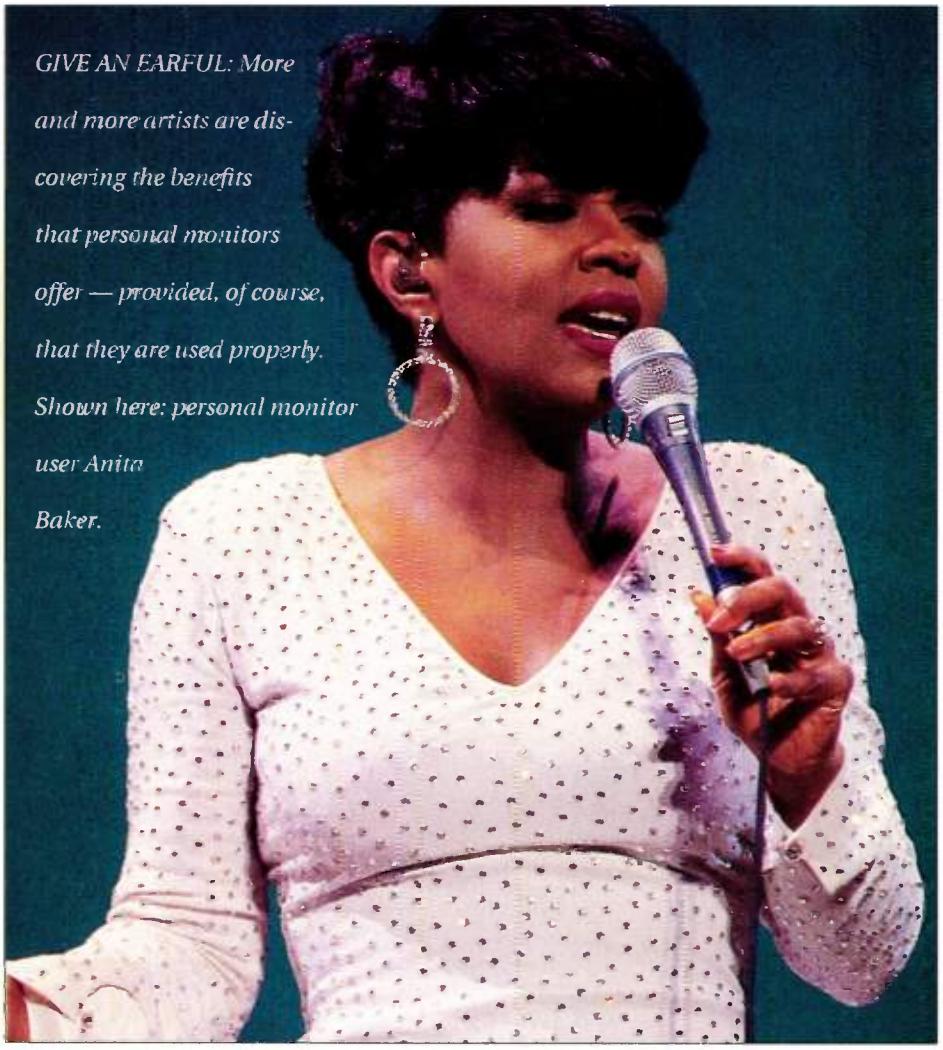
EAR MIXING 101

PERSONAL MONITORS OPEN A WORLD OF OPPORTUNITIES FOR BOTH PERFORMERS AND ENGINEERS — PROVIDED THEY ARE USED PROPERLY

By JP Armstrong



GIVE AN EARFUL: More and more artists are discovering the benefits that personal monitors offer — provided, of course, that they are used properly. Shown here: personal monitor user Anita Baker.

PHOTOS BY STEVE JENNINGS

So you get this phone call..."Dude! Guess what! We just bought new personal monitors for the band!"

"Huh?"

"Yeah! And we fired that loser monitor dude, too. You're gonna mix monitors! It'll be *great*!"

Thus begins your journey into the world of personal monitors. The house engineer thinks it's cool. The band isn't sure. The accountant wants you to send the whole rig back. And you don't even like headphones. Fear not, for the voodoo to do is not hard to learn. Personal-monitoring systems are yet another tool for curing stage ailments, but they are neither an easy fix nor a cure-all. PMs are not significantly superior to floor monitors — in fact they present a vast range of difficulties of their own. However, they certainly have advantages over traditional monitoring systems and — used properly — can provide benefits besides simply making life easier for the FOH engineer.

My own experience with PMs has been a series of hypotheses and experiments, some more successful than others. These modern monitoring systems have spawned multitudes of approaches to their use. I have seen many engineers grappling with the same problems in different ways. But there are a few things that I've learned...

FIRST DAY OF SCHOOL

The primary concerns of mixing personal monitors are fairly simple. First is audibility (duh). The desire to achieve clarity and consistency is the artist's primary concern and motivating factor in purchasing an PM system most of the time. That and looking cool. Second (and no less important) is safety, specifically the protection of ears that might be worth millions of dollars. Musicians should be responsible for being aware of their volume levels and liability for hearing damage, but it is imperative that engineers make musicians aware of the risks they run (and in my opinion are negligent if they do not). I have found that most professional musicians are concerned with protecting their hearing and are usually willing to try to adjust their habits to do so. (Until showtime anyway.)

I try to set a personal monitor level with the artist's vocal mic that sounds more or less the same as when I speak loudly in a quiet room. This is usually at or about the maximum undistorted output level of the wireless system. Adjust the compression so that a strong signal crosses slightly past the compression threshold, and a full-on scream goes deeply into compression. *It is not impossible to hear PMs at this volume.* The usable limit of SPL at the eardrum is not only finite, it is something to which peo-

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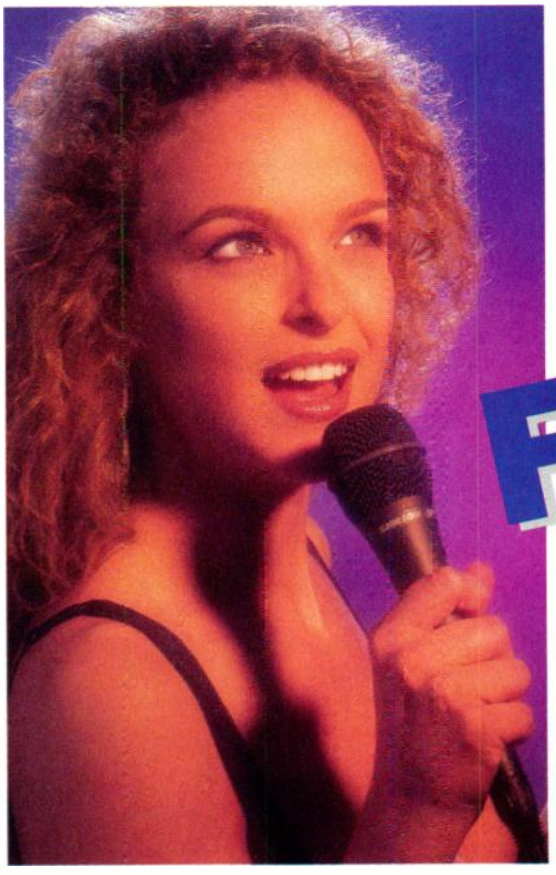

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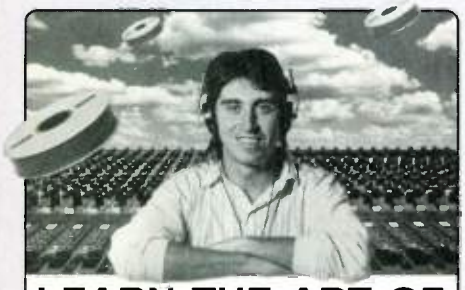

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ple become accustomed. I have several clients who have trained themselves to be comfortable with volume levels that are only a step below detonation of a small high-explosive device. Helping them to lower their comfort threshold is a delicate political negotiation, but it is something that a conscientious engineer will at least mention now and again. The only reason one thinks one needs more volume is external masking. Anything louder is only going to cause further hearing damage.

THE ABCS OF SPLS

A show during which the house PA or the band's instruments create SPLs greater than about 105 dB at the vocal mic usually creates the necessity of chasing the artist's vocal mic ±6 or 12 dB to prevent the mix from sounding like a train wreck when the artist steps away from the mic. This effect goes almost unnoticed when using floor wedges, but it can be the PM engineer's worst nightmare. Of course, if a singer puts out 110 dB of vocal but the ambient sound pressure at the mic is 115 dB, you're fighting a losing battle — personal monitors cannot fix this. However, personal monitors can be used to amplify a weak vocal — provided the engineer has time to "chase" the mic with each vocal line, or the ambient stage volume is sufficiently low.

MOBILE MONITORS

The first significant difference between traditional stage monitors and personal monitors is that while floor (or "open") wedges just sit there (if they're lucky), personal monitors follow the artist around on a stage. Although we hear with our ears, that's only the beginning of the sensation we call hearing. Everybody knows how we feel very low frequency response more than we hear it, but it seems many people fail to recognize how much of the rest of the audible range is perceived in places besides our ears. The creation of a transparent image requires the engineer to complement the sound already present at an artist's position on stage. This means assessing whatever is rolling around the stage, the room, and the artist's head — then attempting to fill in only enough holes to make it feel natural.

Which leads us to the second major difference between floor wedges and PMs: reverberance. Reverb exists in every environment, and must be simulated. The primary function of a reverb in an PM mix is to bridge the gap between the artist's head and the PA system. Personal monitors tend to sound muddled when the mix is too dry, or the reverb's decay time is too long or too short. The yardstick for a proper PM reverb setting is the sound of the environment in which they will be used.

Other common mistakes in personal monitoring are rooted in and around this 'psychology of hearing.' By and large, musicians are right about their monitoring problems onstage, even if they can't find a way to express it. Troubles usually arise when an engineer fails to account for circumstances the musician experiences. For example, what sound can one hear which is always centered in one's field of hearing? Your voice is the only sound that you hear so consistently. Your own voice decreases the efficiency of your hearing ability by causing increased pressure in the nasal cavity and Eustachian tube, which changes the way things sound when we speak (or, more importantly, sing). This is one of the first things one should discover about PMs.

Here's an example: If a microphone is being used up for a primary vocal and adjusted it so that it sounds loud and full-bodied for *your* voice, the odds are your artist will seem so (comparatively) loud it will make your head ring when they belt out the first line. Yet they may ask you for more. Artists are often surprised to hear how loud someone else sounds when singing through the same mic. When there is no properly timed external sound pressure to provide a reference for the person singing, the sound is not perceived as loudly. Reverberance from the house PA usually exacerbates this phenomena, as it is delayed and usually lacks any discernible high-end components, which serves to muddle perception. We are working with people, so it is important to remember to think of a room (or other environment) as a mono sound source; only people are stereo. But people hear with their ears and their bodies, so accommodating all three is very important.

"LET IT EAT"

PM mixes also need to be tailored to the type of instrumentation they'll be monitoring. Most guitarists hate the way their guitar sounds through PMs. This is because a tone that should be coming from a 12-inch speaker and moving a bunch of air (and shaking your insides) is being pushed through a driver that is 2.5 mm in diameter. It sounds bad. The key is approach (and this is very important): *For a vocalist, PMs are monitors, but for a guitarist (or a drummer, or other loud players), PMs are protection.* The reason why an engineer can't make PMs sound like a Marshall stack should be obvious, but I

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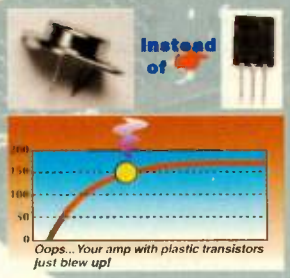
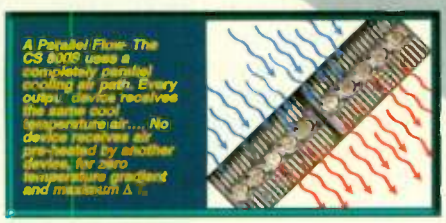


Oops... Your amp with plastic transistors just blew up!



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.

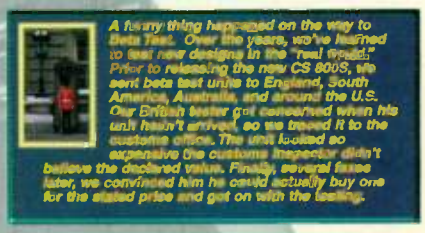
With two variable-speed 32 CFM fans cooling hundreds of square inches of heat sink area, and metal (TO-3) power devices (in the air stream), the CS 800S will play very loud for very long (years - not minutes or seconds).

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.)

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)



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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.

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World Radio History

Miking Acoustic and Ethnic Instruments

How to get the sound you are looking for without ruining the natural tones of the instrument

By Mike Sokol

The musical performance industry is on a back-to-the-basics trend. After the last few decades of buildup from the simplistic technical setups of the '60s to the mega-stages of the '80s, more acts are unplugging their banks of stage amps and going to a simpler acoustic set up. This is great for musical writing and arrangement, since now popular music has broken the mold of guitars/drums/vocals popular since the Beatles and Elvis. Eric Clapton, Crosby, Stills & Nash, among others, have done acoustic albums and tours, lending pop credibility to this oldest of performance formats. Popular acts have begun to use a wide variety of ethnic and acoustic instruments both in performance and recording, and in doing so have broadened the possibilities of musical structure and style. Many studio techniques can be used in the field for live sound reinforcement of acoustic instruments, as long as the basic physics and limitations of "real instruments" are understood by both the musicians and technicians.

WHAT ARE "ACOUSTIC" INSTRUMENTS?

For the purposes of this article, acoustic and ethnic instruments will be defined as those instruments designed and built to sound "complete" without any additional amplification, signal processing, or digital sampling. Even though, technically, all music becomes acoustic when it's finally heard by a listener, many popular instruments don't qualify. For instance, I don't consider a modern rock drum kit to be an acoustic instrument, although there are no transistors involved. The process of close miking each drum, gating the snare with added reverb and white noise, and processing the kick drum, produces a drum sound that only remotely resembles the actual sound of a real drum kit. If you don't believe this, mute all the drum mics for a moment on your next soundcheck and listen to the drum sound. Or better yet, go to a small jazz club where a drum kit is used intentionally without amplification — a good example of what an acoustic drum set really sounds like. You'll be surprised at the tonal differences between miked and acoustic drums. They're really two different instruments, as dissimilar as electric and acoustic guitars.

Speaking of electric guitars, Stratocasters and Les Pauls running through Fender or Marshall guitar amplifiers don't qualify as acoustic instruments either. True, the sound eventually does come out in acoustic form from the speakers, but the endless variations in tone and timbre are mostly produced by the nearly infinite combinations of pickups, amplifier settings, speaker enclosures and external processing gear (e.g., stomp boxes) rather than any acoustic treatment done in the instrument itself. Yes, it's a refined and defined sound all its own...it's just not acoustic.

Real acoustic instruments make noise on their own, and it's the job of the recording and reinforcement engineer to capture and amplify that sound without adding or subtracting from the basic sonic qualities of the instrument. While it's pretty easy to mic a Marshall stack and a Strat as long as you have sufficient power in the FOH system to overcome the sonic bleed from the stage, getting the real sound of a didgeridoo or hammer dulcimer can be challenging, especially on a live stage for a large audience.

START BY LISTENING

This may seem obvious, but there are literally thousands of ethnic instruments, each with its own "proper" sound. Many have resonators, jangles, and timbres that will be strange and unfamiliar to you. First, find a quiet corner off the stage and have the musician play a representative tune that spans the full register of the instrument. Now, really listen and try to

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7. **Save Feature** allows you to save up to 50 of your edited/defined effects.
8. **Value Control Wheel** allows you to select an effect, or control the value of a parameter being edited.
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cians blowing across the top of the opening. This makes a wind blast that will cause most mic diaphragms to "bottom out." In the studio, pop screens are very effective, but in live situations, a foam pop filter is usually the best you can do. Of course, some pop filters cause high-frequency roll-off. But this can usually be corrected by a 2 or 3 dB boost in the 10 to 15 kHz region. Just use your ears.....

ON-BOARD MICS

In the last few years, miniature condenser microphones such as Audio-Technica's ATM15 have become very popular with bluegrass and Celtic musicians. This miniature electret-condenser microphone can be clipped directly to the sound hole of most stringed instruments. Other miniature mics such as the AKG 409 are mounted on a stalk that allows the element to be positioned a few inches above the surface of the instrument. This is a favorite microphone of a tuba player I regularly engineer. A mic positioned this way has the advantage of always being in the same relative position with respect to the instrument, an advantage when the artist moves around a lot. (Yes, the tuba player does have a wireless rig.) But care must be taken in positioning miniature microphones next to the nose and mouth of musicians playing instruments close to their face. Violins miked this way often pickup the huffing and puffing sounds of the musician mixed in equally with the sound of the instrument. This is most noticeable on quiet passages, and will spoil an otherwise good recording.

Some of the simplest acoustic instruments can be as loud as an electric guitar going at full tilt.

BUILT-IN PICKUPS (DI SENDS)

Many acoustic guitars are now factory built with internal pickups: some with a simple piezo transducer under the bridge, others consisting of multiple internal condenser mics and piezo transducers with on-board mixers and equalizers. Just down the road from my studio, Paul Beard builds his world-class resonator guitars, adding a Crown miniature microphone inside them for ease of use on stage. Even accordions get treated this way, with a line-array of miniature microphones down the front of the reed chamber, and a separate bass mic with a coiled cord to allow operation of the bellows. K&K Sound Systems [http://www. kksound.com] makes a complete system that has 3 mics for the descant side, and 1 mic for the bass side. Included is a volume control for the bass mic to allow you to adjust balance.

Depending on the design and placement of the pickup elements, the sound of these DI sends can be anything from great to dismal. One good method for using them both live and in the studio is to add a front mic in a good position and route the DI send and mic feeds to separate channels on the mixing board. If you're recording, send the DI and mic feeds to separate tracks, if possible. If you're doing live sound, then the DI feed can be used

continued on page 151

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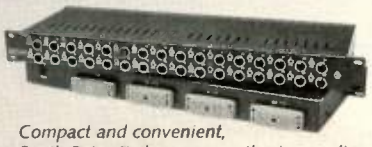

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GEAR FOR YOUR NEXT GIG

KICK IT!

Electro-Voice's N/D868 is a true, large-diaphragm microphone that offers the advantage of extended low-frequency response while its highly directional pickup pattern minimizes its potential for feedback from external stage noise. With a peak in the upper midrange and another bump in the 50–60 Hz range, users can more easily capture both the attack of the beater and the solid bass fundamentals. The new N/D868 comes with E-V's Mermaflex grille, which helps to eliminate dents and bends in the grille surrounding the transducer, while a heavy-duty mic case will help protect it on the road. For more information, contact EVI, 600 Cecil Street, Buchanan, MI 49107. Tel: 800-234-6831. Circle EQ free lit. #125.

CARRY PROTECTION

The new SKB19-3S rack case is designed for shallower depth effects products. The 3-space rack can carry three effects processors in a case that is 11.25 inches deep. The front panel attached with two posi-lock latches that create a weatherproof fit. The rack is roto-molded of high-density polyethylene and is manufactured with a molded-in handle. Price is $99.95. For more details, contact SKB, 13501 SW 128th St., Suite 204, Miami, FL 33186. Tel: 305-378-1818. Circle EQ free lit. #126.

ROLLS WITH IT, BABY

Each channel of Rolls Corporation's RM65 6 x 4 mixer boasts XLR and 1/4-inch inputs with a trim control, bass and treble controls, monitor send, effects send, pan control, and a sliding fader. The master section features the effects return level control and master right and left output level controls. The RM65 utilizes two five-segment LED ladders to indicate the output level of each channel. Each of the units six mic inputs have individual phantom power switches and input gain trims located on the rear panel. For further details, contact Rolls Corporation, 5143 South Main Street, Salt Lake City, UT 84107. Tel: 801-263-9053. Web: www.xmission.com/~rollsrfx. Circle EQ free lit. #127.

DATE WITH EIGHT

Designed primarily for FOH applications, DDA's new CS8 modular, 8-bus console has eight subgroups, eight auxiliary sends, and six matrix outputs. The CS8 also features DDA's proprietary Spatial Image System (SIS), which lets the signal be panned left-to-center or right-to-center. The modules are configured in blocks of eight, and the individual vertical PCBs are removable with the rotary knobs still attached. The console also has long-throw faders, switchable gain, phase reversal, 4-band swept mid EQ, and three pre/post switches. For more information, contact the EVI Professional Audio Group, 448 Post Rd., Buchanan, MI 49107. Tel: 616-695-4750. Circle EQ free lit. #128.

YOU'LL ALWAYS HAVE PARIS

Technomad's new Paris 616 speaker, like its other speakers, is designed to withstand the rigors of live sound — both indoors and out. The Paris is specifically designed for high-output, distributed sound systems, compact mobile sound, or underbalcony and delay fills. The Paris features the company's WeatherTech housing, which is a sealed, 1/2-inch thick, Mil-Spec, roto-molded polyethylene cabinet with a 10-year unconditional guarantee. For more information, contact Technomad, 12 Elm Street, Hatfield, MA 01038. Tel: 800-464-7757. Web: www.technomad.com. Circle EQ free lit. #129.

POWER UP

Yorkville's Micromix Series mixers have been redesigned to provide more power with additional features at lower prices. New features include scratch-resistant front panels with metal phone jacks; 9-band graphic EQ; built-in limiter; XLR, 1/4-inch, and RCA inputs; and 19-inch rackmount versions. New models include the MP10DS stereo powered mixer, which has 6 mono and 2 stereo channels and a price of $999; the MP8D dual-powered mixer, which is an 8-channel unit with a price of $899; the MP8DX 8-channel

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EQ LIVE

Yorkville Micromix

mixer, which has dual power amps and a price of $1099; and the MP6T 6-channel power mixer, which has a price of $699. All of the mixers come with Yorkville's standard two-year warranty. For more information, contact Yorkville Sound, 4625 Witmer Industrial Estate, Niagara Falls, NY 14305-1390. Tel: 716-297-2920. Circle EQ free lit. #130.

31 Flavors

Symetrix, Inc.'s 532E is a 2-channel, 31-band, 1/3-octave, graphic equalizer. It is a 2U dual mono EQ with 20 mm sliders. The constant Q design features ±12 and ±6 dB range switching, variable high- and low-cut filters, fail-safe bypass relays, and an internal power supply. The constant Q filters are built with multi-dielectric high-precision film capacitors. The 532E has direct coupled inputs and DC servo-controlled outputs that remove DC and produce extended low-frequency response (–3 dB at 6 Hz). The price for the 532E is $699. For more information, contact Symetrix, 14926 35th Avenue West, Lynnwood, WA 98037. Tel: 206-787-3222. Web:www.symetrixaudio.com. Circle EQ free lit. #131.

Lovely to CQ

Meyer Sound Laboratories has recently released the CQ-1 and CQ-2 self-powered reinforcement loudspeakers. The speakers, like all of the products in Meyer's Self-Powered Series, feature the Intelligent AC system, which performs automatic voltage selection, EMI filtering, soft current turn-on, and surge suppression. The CQ speakers are phase corrected models that are available in either high Q (CQ-2) or low Q (CQ-1) configurations. CQ stands for "constant Q," which means that the distribution of acoustic energy is even across the coverage area, for all frequencies. Both models have a 15-inch low-frequency driver and a frequency response of ±4 dB from 40 Hz to 18 kHz. The CQ-1 provides a SPL of 136 dB, while the CQ-2 provides 139 dB. For more details, contact Meyer Sound Laboratories, 2832 San Pablo Ave., Berkley, CA 94702-2204. Tel: 510-486-1166. Web: www.meyersound.com. Circle EQ free lit. #132. EQ

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ATI 8MX2 Mic Preamp/Mixer

BY EDDIE CILETTI

Thinking of doing remote recording? If so, you would do well to purchase digital 8-track recorders, which, because of their compact size, are well-suited for live recording. The 8-tracks have certainly made what used to be a luxury (i.e., recording each performance) for touring artists much easier and commonplace. In addition, you also might want to look at the new Audio Toys Incorporated (ATI) 8MX2 mixer, which can make the job even easier.

You might being asking, "Why pay $1899 (list) for an 8 x 2 mixer?" The answer, quite simply, is "space." Not as in "The Final Frontier," but rather as in the *lack* of space that is the common thread linking life on the road with that of apartment dwellers from Tokyo to Manhattan.

The 8MX2 comfortably accommodates eight high-voltage mic preamps, each with phantom power, a peak limiter, and phase reverse and cue/solo switches, in a single rack space. All eight post-limiter outputs end up on a single female DB-25 connector that — via snake outfitted with the appropriate multipin connectors — will interface to the analog inputs of your favorite digital or analog recorder. Another female DB-25 connector accepts the "return" signal from the recorder for monitoring via the built-in 8 x 2 mixer.

Notice that at no time did I say this stuff has been "squeezed" into a single-rack space. That's because ATI uses surface-mount technology that leaves a remarkable amount of breathing room under the hood. (There's even a fan inside!) Few compromises have been made with this product's sonic integrity. It's not a vintage Neve or a modern API module, but it is capable of delivering uncolored, clean, punchy sound. It is also remarkably quiet.

THE "D" CONNECTION

The DB-25 connector is identically configured to those on the TASCAM DA-38/88 and Fostex RD-8. It outputs and accepts high-level (+4 dBu) balanced signals. For this review, I used an RD-8 and made my own interface using a flat ribbon and a pair of DB-25 (male) insulation displacement-type connectors (from Ray's Shack). While twisted-pair cabling is recommended, it is likely that the 8MX2 will live immediately above or below the tape machine. Therefore, I chose the flat cable as much for convenience as I did to challenge the situation. Challenge met; rack wiring neat.

HARNESSING THE DOCUMENTATION

ATI offers five-foot harnesses for all of the popular recorders, including the Roland DM-800. There's also a 12-inch DB-9 jumper to link multiple 8MX2's. According to the manual, custom configurations are also an option. Documentation is excellent. All connector pinouts are clearly detailed and information specific to the interface (cue logic levels, VCA control voltage, etc.) is presented in a non-proprietary, no-bull manner. A blueprint schematic was included with the review unit.

Users familiar with ATI gear will appreciate that the 8MX2 employs the same, high-voltage (48 V) preamp technology found in its Paragon console and Pro6 Processor. The 8MX2 interfaced perfectly with the Fostex RD-8. Gain structure was such that all of the controls were able to live in their design-optimized positions. Even with every channel cranked, the mixer only disclosed the noise of the source (the RD-8).

At the mic inputs, a Wurlitzer electric piano was connected via the custom direct box featured in my March *EQ* maintenance column. The ATI limiter is very fast and, in conjunction with the mic preamp, sounded warm and clear on vocals using a Shure SM58. Its infinite-to-one ratio is intended to level peaks and not for use as an "electric crayon." For example, when excessively set as a compressor, it attempted to "undo" the Wurlitzer's built-in vibrato.

Choosy folks would argue that there is no [on-board] VCA bypass. I'll put forth that it is better to have peak protection than distortion. Other than the VCA (THAT's 2181A), all of the op amps are Analog De-

ROAD TEST

MANUFACTURER: Audio Toys, Inc., 9017-C Mendenhall Court; Columbia, MD. Tel. 410-381-7879. Web: www.audiotoys.com.

APPLICATION: Analog mic preamp-mixer combination for use with an 8-track recorder.

SUMMARY: Eight mic preamps, each with phantom power, plus an 8 x 2 mixer to monitor the return from tape.

STRENGTHS: Each preamp has a peak limiter to maximize the signal to tape, phase reverse, and cue (solo). The mixer has additional input/output connectors for linking multiple units plus a stereo tape return.

WEAKNESSES: Could use more blinkies!

PRICE: $1899 **EQ FREE LIT. #:** 133

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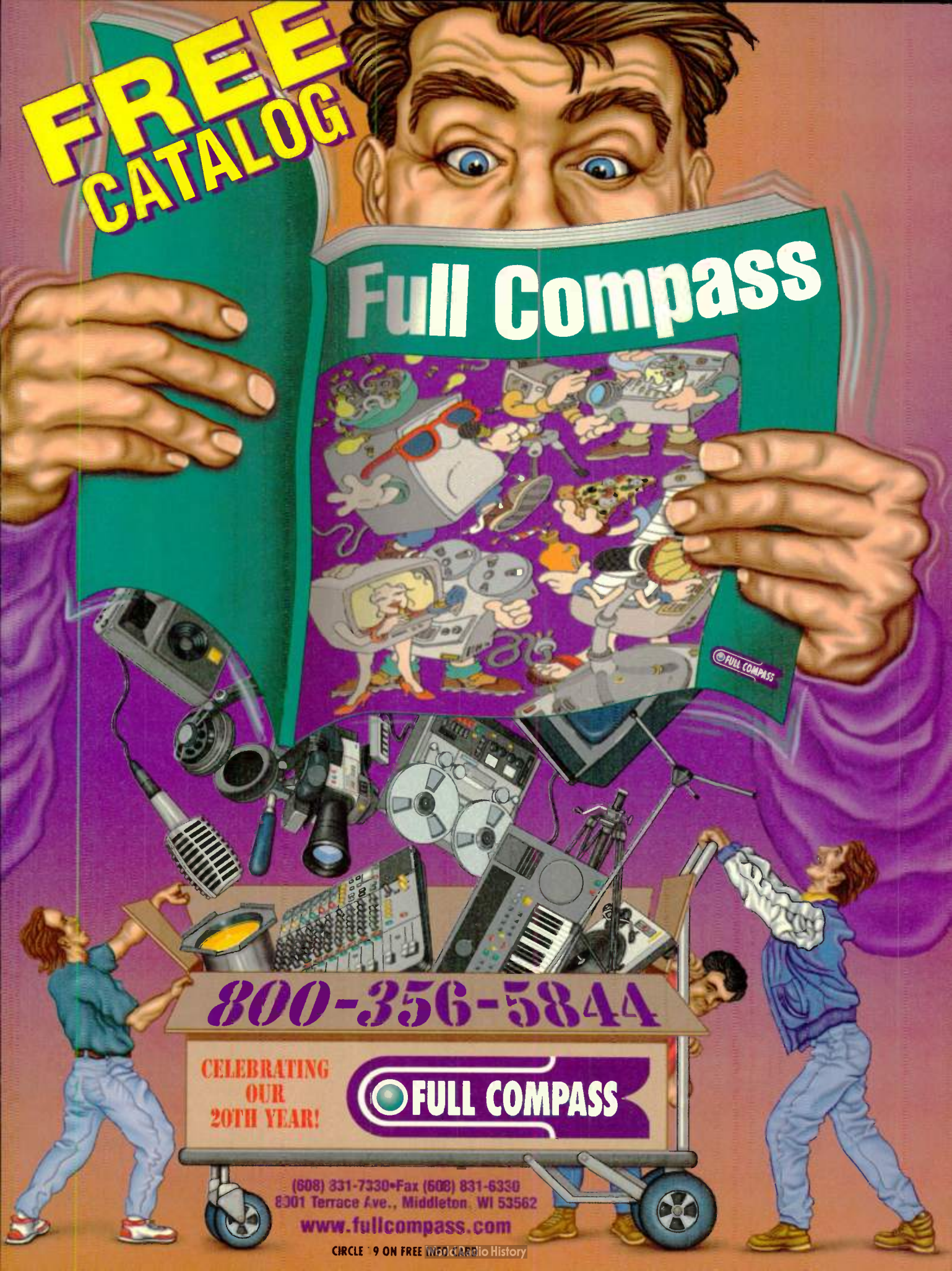

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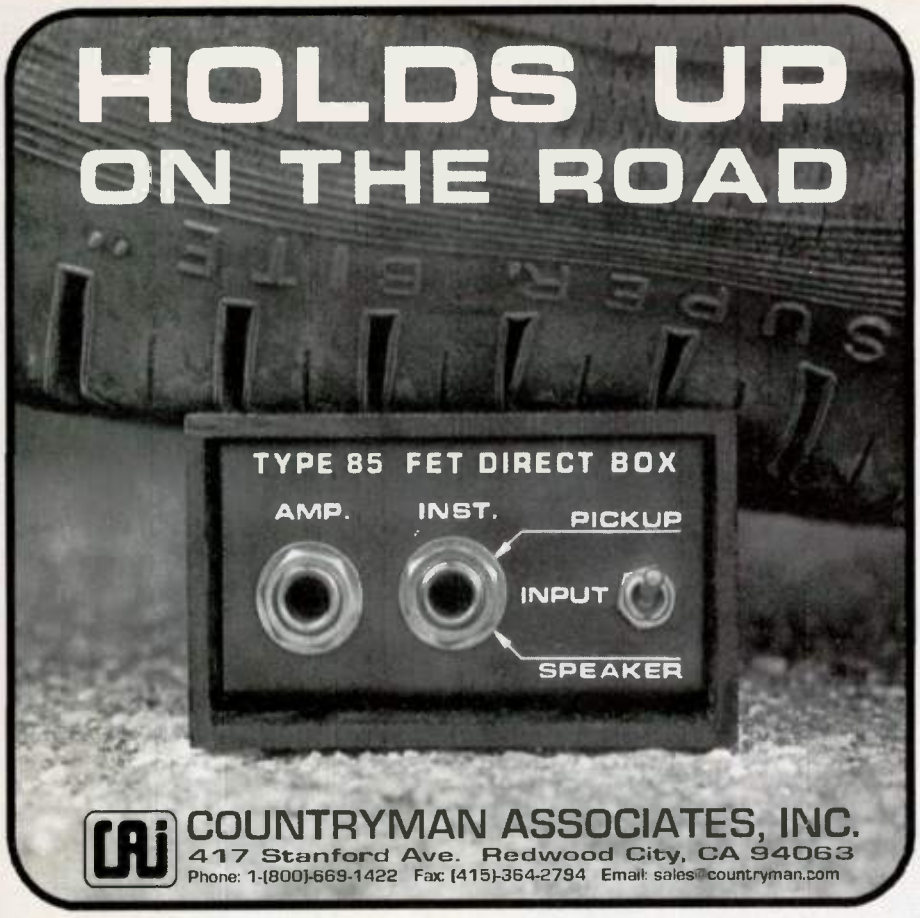

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EQ LIVE

vices OP275GS, with the exception of the SSM 2142 balanced output amplifiers. The latter are also the only socketed ICs. Inside, the layout is clean (there's even a little elbow room) and the bipolar 20-volt rails ensure the 20-dB headroom spec. Clipping is +24 dBm.

On the front panel are four switches per channel, three in the master/monitor section. The monitor can select the mix bus, the cue bus, and the 2-track return. (The latter item can also serve as an effects return via the only internal jumpers.) On the rear panel are Phantom Power and Ground Lift switches for each channel.

In a stand-alone application, the location of the phantom switches might be a little inconvenient, but it is a set-and-forget deal on a per-gig basis. In any professional encounter, such as those including a mic splitter, phantom is provided either by the FOH or monitor mixer, in which case, the Ground Lift switches are key.

There are two LED bargraphs: one to indicate signal level; one to indicate the amount of gain reduction. There is no room on the front panel for individual level or limiting LEDs. (It occurred to me that, circuitry permitting, LEDs could be mounted behind translucent button caps....) All dreaming aside, a live recording requires constant user-intervention. If you're watching the signal to tape and an occasional peak upsets what otherwise would be the optimum gain setting, then just dial in a little limiting and pay attention.

Perhaps the only obstacle to a long trouble-free existence for this unit is the length of its knobs. If the 8MX2 is your idea of nirvana, consider having the rack rails recessed about 1-1/4 inches. It would be a shame to lose "controls" from an accidental side swipe.

THE INTERNATIONAL ROAD WARRIOR

Live recording applications offer little time to experiment. The primary goal is to accurately capture a signal of sufficient level with minimal distortion and the least possible electrical interference. With a name like Audio Toys Incorporated, you know that the 8MX2 has nothing to do with fruit preserves. It does, however, have the potential to get you into the jam (session). No other specialty mixer comes to mind that is equally compact, versatile (100 to 240 volt AC), and roadworthy. EQ

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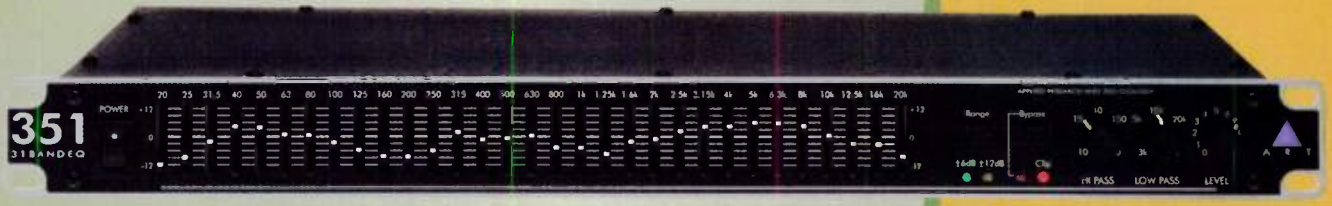
Real World Dependability and Value



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Lexicon MPX 1 *Multieffects Processor*

Lexicon gives a number of effects in one good-sounding, intuitive package

BY ROGER NICHOLS

This could turn out to be the shortest review I have ever done. All you really need to know is that it is a Lexicon, it sounds as good as the name implies, and it is affordable. Now go buy one. See you next time.

For those of you who have decided to read on, I will dig a little deeper into the Lexicon MPX 1. By now we know that a "multieffects processor" is a box that can provide us with many effects simultaneously. All of the effects are added to the single stereo audio source.

The MPX 1 can provide 56 different pitch, chorus, EQ, modulation, delay, and reverb effects. Combinations of these effects are available in 200 preset (and 50 user) programs designed for a wide variety of audio sources and applications. You can also sort the program database by type so that only the ones you are interested in scroll by as you audition different programs.

Lexicon's expertise is high-quality reverb sounds. There probably isn't a studio in the world that doesn't have at least two Lexicon reverbs. To maintain the high standard, the MPX 1 employs two separate DSP processors. One, the Lexichip, is dedicated to delivering the world-class stereo reverb and ambience algorithms. The other is a fast-math DSP used to create the other effects. This means that if you decide to throw every effect at the incoming audio, no amount of complexity will compromise the quality of the ambience or reverb settings.

Some reverbs with a single DSP start stealing processor power from one effect to allow the addition of another effect. The reason being that you won't notice a few missing early reflections if you are slicing and dicing the sound with bizarre algorithms from other effects. No cheating here.

The MPX 1 also contains a multilevel Help system built in, so you don't have to keep referring to the manual to remember how to access seldom-used features. At any time just press and hold any button to display a message explaining the function of that button without executing any action. There is also a sleep mode that, when selected, displays useful messages when the MPX 1 is idle.

Oh, don't let me forget, the MPX 1 also has digital In and Out via S/PDIF connectors on the rear panel. Thank you, Lexicon.

FRONT PANEL

The front panel has many dedicated indicators and displays to let you know where you are and what features are available at all times.

- Effect Select buttons that light to show which effects are active in a particular program. Each effect can be turned on or off individually so you can hear how a complex effect is built.
- Tempo LED that flashes at the current tempo in any program that uses tempo-controlled delay times or modulation rates.
- Tap button that lets you change tempo on the fly.
- A/B button that lets you morph between two effects or parameters when lit.
- Numeric display that makes program and patch numbers highly visible.
- Alphanumeric display that shows

EQ LAB REPORT

MANUFACTURER: Lexicon, Inc., 3 Oak Park, Bedford, MA 01730-1441. Tel. 617-280-0300. E-mail: info@lexicon.com

APPLICATION: Spatial multieffects for the studio, stage, and individual instruments.

SUMMARY: Performs well, offers functionality not found elsewhere, great sounding reverb.

STRENGTHS: Employs two separate DSP processors; built-in help function; well done display; digital I/O, extensive MIDI control; 200 good presets; it's affordable; it's a Lexicon.

WEAKNESSES: Mutes momentarily when changing effects; menus can sometimes be overwhelming, but I suggest Lexicon leave it with me long enough to find some real weaknesses.

PRICE: $1299 **EQ FREE LIT. #:** 134

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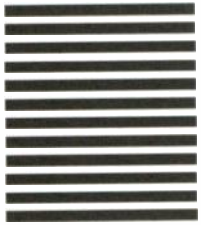

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programs, parameters, and routing displays.

• Mix button give you instant access to mix and level settings without having to navigate menus.

• Patch button that lights whenever a patched parameter is displayed, allowing you to access the patch directly.

• Options button that lights whenever additional features are available.

The front panel also includes input and output level controls when connected to an analog source. There is an Edit button to access the parameters of a program for editing, a Store button to save edited programs and a System button to change some of the global settings like digital I/O, MIDI response, and whether Tempo and Mix are global or program specific. I won't mention the On/ Off switch because I don't ever expect to see an MPX 1 in the Off position.

Patch is a feature that you don't see very often, yet it can make the difference as to whether an effect is so-so or amazing. When you have a bunch of separate effects boxes connected to an audio source, the order in which you connect them determines the final sound. Sometimes the audio goes serially from one to the other and sometimes they should be connected in parallel to obtain the desired results.

The MPX 1 provides a graphic method of connecting the effects together. They can be connected any way you want, just as if you were using a physical patchbay and mixer. You can go through one effect, split the signal, and feed it through two other effects, merge them back together for another effect, split them apart again, tie them in a knot, and then merge them together for the final output. Throughout the patching, all routing remains stereo.

EXTERNAL CONTROL

Of course, the MPX 1 has MIDI bulk data dump and load capability, but the MIDI features don't stop there. All effects parameters can be controlled via MIDI. You can also have MIDI control over master and individual bypass, mix, level, A/B morphing and tempo tap. Tempo parameters can be synchronized to incoming MIDI clock. The MPX 1 can also generate MIDI clock based on its internal tempo setting.

All of the MPX 1 internal control sources (audio level, LFO, ADR, S/H, pedal, etc.) can be transmitted as MIDI Continuous Controller messages.

SOUND QUALITY

I knew it would come to this. I played with the MPX 1 for two weeks before writing this review. Sometimes when you first listen to a new piece of gear it sounds great, until the novelty wears off. Then you start to hear problems. Not so with the MPX 1.

The reverb quality is dense and smooth. You can't hear any unwanted artifacts in the reverb tails. The ambience is as good as that in a Lexicon 480, the flagship of the Lexicon line. The delayed audio sounds as good as the original audio. With each effect it is easy to tell the difference when a parameter is changed only slightly. Drums pumped into the reverb don't rip your head off, they are smooth and the space is realistic.

Actually, I hope you don't believe me. You'll just have to buy one and try it out for yourself. EQ

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They *LAUGHED* when I said they could have **Perfect Pitch**

...until I showed them the secret!

► The **TRUE STORY** *by David L. Burge*

It all started in ninth grade as a sort of teenage rivalry.

I'd slave at the piano for five hours daily. Linda practiced far less. But somehow she always had an edge that made *her* the star performer of our school. It was frustrating. *What does she have that I don't?* I'd wonder.

Linda's best friend Sheryl sensed my competition. One day she bragged on and on about Linda, adding more fuel to my fire.

"You could *never* be as good as *Linda*," she taunted me. "*Linda's* got *Perfect Pitch*."

"What's Perfect Pitch?" I asked.

Sheryl gloated over a few of Linda's uncanny abilities: how she could name any tone or chord—*just by ear*; how she could sing any pitch she wanted—*from mere memory*; how she could play songs after only *listening* to them on the radio!

My heart sank. *Her fantastic EAR is the key to her success* I thought. How could I ever hope to compete with her?

But later I doubted Sheryl's story. How could anyone possibly know F♯ or B♭ just by *listening*? An ear like that would give them a *mastery of the entire musical language!*

It bothered me. Did she *really* have Perfect Pitch? I got up the nerve, approached Linda, and asked her point-blank if it were true.

"Yes," she nodded to me aloofly.

But Perfect Pitch was too good to believe. I rudely pressed, "*Can I test you sometime?*"

"OK," she replied cheerfully.

Now I'd make her eat her words...

My plan was ingeniously simple: I picked a moment when Linda least suspected. Then I boldly challenged her to name tones *by ear*.

I made sure she had not been playing any music. I made her stand so she could not see the piano keyboard. I made certain that other classmates could not help her. I set everything up perfectly so I could expose her Perfect Pitch claims as a ridiculous joke.

Nervously, I plotted my testing strategy. Linda appeared serene. Then, with silent apprehension, I selected a tone to play. (She'll *never* guess F♯!)

I had barely touched the key. "F♯," she said. I was astonished. I played another tone. She didn't even stop to think. *Instantly* she announced the correct pitch. Frantically I played more tones, skipping here and there all over the keyboard. But somehow she knew the pitch each time. She was *SO amazing*. She knew tones like colors!

"Sing an E♭," I demanded, determined to mess her up. She sang a tone. I checked her on the keyboard. She was right on! Now I was starting to boil. I called out more tones for her to sing, trying hard to make them increasingly difficult. Still she sang each note perfectly on pitch.

I was totally boggled. "*How in the world do you do it?*" I blurted.

"I don't know," she sighed. And to my dismay, that was all I could get out of her!

The dazzle of Perfect Pitch hit me like a ton of bricks. My head was dizzy with disbelief. Yet from that moment on I knew *Perfect Pitch is real.*

I couldn't figure it out...

"*How does she DO it?*" I kept asking myself. On the other hand, why can't *everyone* recognize tones by ear? It dawned on me that most musicians can't tell a simple C from a C♯, or the key of *A major* from *F major*! I thought about that. A *musician* who cannot tell tones by ear?! That's like a painter who can't recognize the rainbow of colors on his palette! It seemed odd and contradictory.

I found myself more mystified than ever. Humiliated and puzzled, I went home to work on this problem. At age 14, this was a hard nut to crack.

You can be sure I tried it myself. I would sweet-talk my three brothers and two sisters into playing tones for me, which I would then try to identify by ear. My attempts were dismal failures, a mere guessing game.

So I tried playing the tones *over* and *over* in order to memorize them. I tried to feel the "highness" or "lowness" of each pitch. I tried day after day to learn and absorb those elusive tones. But nothing worked. After weeks of struggle, I still couldn't do it. So I finally gave up. Sure, Linda had an extraordinary gift: the ultimate ear for music, the master key to many talents. I wished I had an ear like that. But it was out of my reach.

Then it happened...

It was like a miracle. A twist of fate. Like finding the lost Holy Grail. Once I had stopped *straining* my ear, I started to listen NATURALLY. Then the incredible secret to Perfect Pitch jumped right into my lap.

I began to notice faint "colors" within the tones. Not *visual* colors, but colors of *pitch*, colors of *sound*. They had always been there. But this was the first time I had ever "let go"—and *listened*— to discover these subtle differences within the musical tones.

Soon—to my own disbelief—*I too could recognize the tones by ear!* It was simple. I could hear how F♯ sounds one way, while B♭ has a *different sound*—sort of like "hearing" red and blue. The realization struck me: THIS IS PERFECT PITCH! This is how Bach, Beethoven and Mozart could envision their masterpieces—and know tones, chords and keys all by ear—*by tuning in to these subtle "pitch colors" within the tones.*

It was almost childish—I felt sure that *anyone* could unlock their own Perfect Pitch with this simple secret of "color hearing."

Bursting with excitement, I went and told my best friend Ann (a flutist) that she too could have Perfect Pitch. She *laughed* at me.

"You have to be *born* with Perfect Pitch," she asserted. "You can't develop it."

"You don't understand what Perfect Pitch *is* or how it works," I countered. "I couldn't recognize one note before. Now it's *easy*."

I showed her how to listen. Timidly, she confessed that she too could hear the pitch colors. With this jump start, it wasn't long before Ann had *also* acquired Perfect Pitch.

At school we became instant celebrities. Classmates would test our ears, endlessly fascinated with our "supernatural" powers. Yet to us, our hearing was nothing "super"—just "natural."

Way back then I never dreamed I would later cause a stir among college music professors. But when I got a little older, I eventually started to explain my discovery to the academic world.

They *laughed* at me. Many told me: "You must be *born* with Perfect Pitch; you can't develop it." I'd listen politely. Then I'd reveal the simple secret—*so they could hear for themselves*. You'd be surprised how fast they would change their tune!

As I continued with my own college studies, my "perfect ear" allowed me to progress far faster than I ever thought possible. I even *skipped over* two required courses. Perfect Pitch made *everything* easier—performing, composing, arranging, sight-reading, transposing, improvising—and it skyrocketed my *enjoyment* of music as well. I learned that music is definitely a HEARING art.

And as for Linda?

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Rocksonics MB-3X
Multiband Stereo Compressor

Extra controls over thresholds highlight Rocksonics's latest compressor

BY STEVE LA CERRA

The most recent offering from Rocksonics is the MB-3X multiband stereo compressor. Unlike most "normal" (mono-band) compressors, the MB-3X is designed with a built-in crossover that routes highs, mids, and lows to three separate gain stages. Mono-band compressors work equally on frequencies across the entire audio range, which can sometimes lead to compression artifacts. A good example of this is the pumping that occurs in a ballad when the kick drum hits — mid and high frequencies get sucked down because energy from the kick is causing gain reduction across the entire frequency spectrum. And even when pumping is not evident, high-frequency loss can still be a problem. By dividing the frequency spectrum at roughly 160 Hz and then again at 1500 Hz, and allowing you to set separate thresholds for highs, mids, and lows, the Rocksonics MB-3X is designed to avoid such problems.

A line-lump power supply is provided to run the MB-3X and is the source of our major gripe with Rocksonics: it connects with a standard five-pin DIN connector — in other words, a MIDI connector. Now in spite of the fact that the plug is labeled with a strip of yellow vinyl "caution" tape, we envision the day the tape falls off, that is the day when some poor fool is fumbling in back of a poorly-lit rack and plugs this power supply into a MIDI port of another effect unit living in the same rack. It is not a pleasant vision. This connector could easily be changed to a six-pin DIN plug (which would *not* mate with a MIDI jack) and would save a lot of heartache. [*Rocksonics says it chose the 5-pin connector because it could be more easily be replaced in the field and, therefore, not force customers to have to procure special-order items. Further, internal power supplies would cause an increase in the $599 price. —Ed.*] In addition to the power supply input, the rear panel is also home to pairs of 1/4-inch inputs and outputs (balanced TRS or unbalanced TS) and a –10/+4 switch for each channel (thank you, Rocksonics).

Controls on the front panel include a Process In/Out switch, threshold, threshold trim for lows/highs and mids (more on those coming), ratio (variable from 1:1 up to 4:1), fast or slow release time, gain, EQ and independent threshold adjustment for the MB-3X's built-in limiter. In the center of the one-rack-space panel is a set of three LED displays that show gain reduction being applied to high, mid, or low frequencies. Rocksonics provides a short but well-written manual to explain the functions of each of these as well as to give you a brief understanding of compression and limiting. We wish that Rocksonics had labeled their controls more accurately. There is no "0" indication for the threshold, threshold trim or EQ, and while it's easy to figure out that 12 o'clock is the "0" mark for the trim and EQ controls, we would like to have seen a hash mark and click stop for accuracy. Repeat settings will not be easy to log.

The manual also clearly explains how to use the MB-3X. The threshold controls should be set so that the meter shows equal gain reduction for each frequency band. At first, this took a little getting used to because of the way the trim controls are labeled. Low/high trim affects threshold for the low- and high-frequency bands. At the center position, trim is at "0" for both bands. As you move the trim knob clockwise, you are simultaneously lowering the threshold for the low frequencies and raising it for the high frequencies. Since the low frequencies are now being more

EQ LAB REPORT

MANUFACTURER: Rocksonics, P.O. Box 442, Los Alamitos, CA 90720. Tel/Fax: 714-901-9238. E-mail: rocksonics@aol.com.

APPLICATION: Recording, live sound, cassette duplication, broadcast production.

SUMMARY: Multiband, stereo compressor with discrete limiter.

STRENGTHS: Offers a very wide range of compression options; –10 or +4 operating levels.

WEAKNESSES: Line-lump power supply; unit is somewhat noisy [see text].

PRICE: $599 **EQ FREE LIT. #:** 135

World Radio History

compressed relative to the highs (the meter confirms this) your signal sounds brighter; vice versa for moving that trim knob counterclockwise. Midrange trim allows the compressor to act more (counterclockwise) or less (clockwise) on the mid frequencies.

Mind you that compressing any of the bands has a distinctly different sound than just using the EQ. You can really change the sound of the source with the MB-3X. For those who don't really want to do so, the company's setup tip can result in compression that is barely audible — though we did notice a slight increase in the noise floor when the unit was switched 'in' (signal absent, no compression). [*Rocksonics makes three good points regarding the increased noise floor: (1) compressors by their nature reduce peaks and raise the noise floor via "make-up gain"; (2) the MB-3X has three VCAs per channel, not just one, so noise the floor is greater than with a single-band compressor; (3) Multiband compressors also equalize, so low-level, high-frequency program material will be accentuated during quiet musical passages. Noise floor measurements are taken at unity gain.*] Make sure that you bring speaker volume level down when using the process switch — it does make a "pop" when engaged.

Rocksonics offers suggested settings for the MB-3X in a variety of applications, and, in spite of the fact that it is a stereo unit, it can be used to compress individual sources such as vocals. By trimming down the high-frequency threshold you can easily tame out-of-control sibilance on a vocal. Too bad there aren't separate controls for each channel because we could see using the MB-3X simultaneously on discrete sources. If you run different signals into the left and right channels, the signal from one channel will modulate the compression on the other channel (which could actually be a cool effect).

We were able to wind the unit up for 15 to 18 dB of compression, and it still sounded good. One application in particular that we really like using the MB-3X for was to compress overheads on a drum kit. By moving the low/high trim to 9 o'clock, the highs were subject to more compression and this seemed to make cymbal crashes last for days. Beware of excessively raising the threshold on the low frequencies because this can make the bottom end build up in relation to the highs and mids (which are getting squashed and seem lower in comparison).

The Rocksonics MB-3X won't solve every compression crisis but by offering a unique palate of sounds it could be a valuable addition to your audio tool kit. EQ

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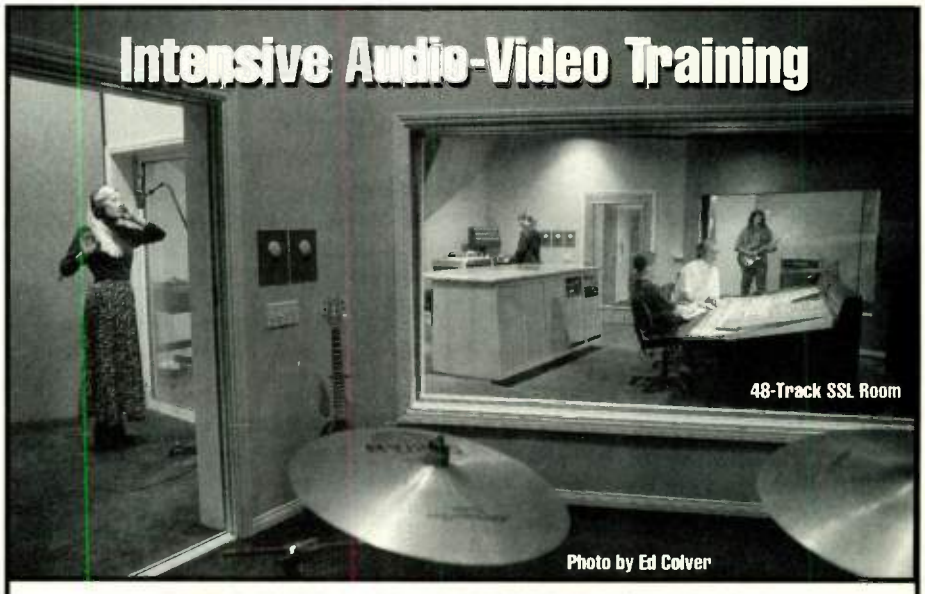

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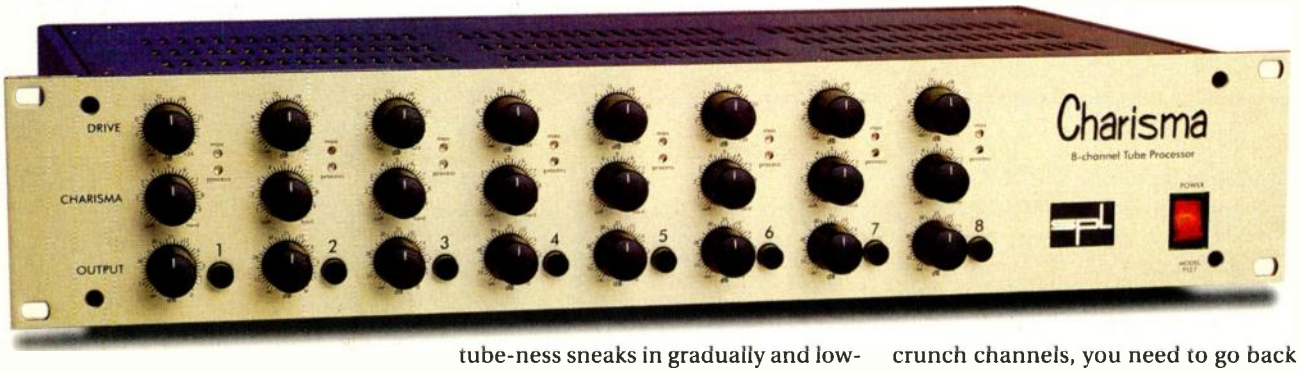

Get a little Charisma in your life to win friends and some warmth to your recordings

BY ROGER NICHOLS

Some people add a certain charisma to a recording session just by showing up. Some of us need help. My help came from SPL (Sound Performance Lab). The Charisma is a device containing eight tubes with line level in and out for each tube channel.

On the Charisma's front panel are three knobs, a Bypass switch, and two indicator lights per channel. The knobs are labeled Drive, Charisma, and Output. The switch is for Bypass on the individual channel.

This knob sets the drive level of the tube. This gives you complete control over the tubes' saturation threshold. The higher the setting, the more tube harmonics are being generated and added into the signal, along with tube limiting, which increases the density of the tubes' distortion.

The Charisma control works much the same as a hard knee/soft knee adjustment on a limiter. At the Hard setting, the signal remains clean up to the limiting point, wherein the tube limiting jumps in with both feet. This adjustment tends to make the sound punch out at you with crisp crunchiness. (You can quote me on that.)

At the Soft end of the control, the tube-ness sneaks in gradually and low-level signals start getting the additional harmonics. The result is a smooth, warm sound. There are more harmonics here than at the Hard setting.

This control is used to set the output level of the channel to compensate for the level increase due to the setting of the Drive control. When you drive the tube harder, it gets louder and you have to turn it down somewhere. This makes it easier to compare a signal with and without processing while maintaining the same relative level.

That's it. What in the world do I use this thing for, you ask? Just about everything, I answer. I have used devices in the past to add tube distortion to instruments, and I like it. The problem usually is that you want to perform the tube compression on more than one channel. With only one device, you have to set up your crunchiness for the first channel, record it to tape, and then work on the next channel. What usually happens is that after you start hearing the interaction between the two crunch channels, you need to go back and change the original sound. It usually takes a few trips back and forth to get the final sound you were looking for.

Since the Charisma is an 8-channel box, you can easily hear the interaction among multiple instruments that are all being crunched. You can also set different channels for different parts of the song, and then switch back and forth among them as necessary without losing your presets.

I tried it on acoustic guitars, and it warmed them right up. If they had gotten any warmer, I would have started worrying about spontaneous combustion. Drums sounded great. I used a little warmth on the overhead mics and tube limited the kick and snare. It sounded just like 2-inch, 16-track analog tape (which I am not allowed to use anymore). Tube compression on a sequenced Moog bass line leapt out at you like a carjacker from behind a bus bench.

Now that I have a Charisma, maybe I will get more respect when I walk into a studio. Try it sometime. EQ

EQ LAB REPORT

MANUFACTURER: SPL (Sound Performance Lab), distributed by beyerdynamic, 56 Central Avenue, Farmingdale, NY 11735. Tel: 516-293-3200/800-294-4463.

APPLICATION: Warm sound for digital recordings; add crunch to direct guitars and keyboards.

SUMMARY: The opposite of Wintery.

STRENGTHS: Multiple channels; line level; balanced or unbalanced without level change; sounds great.

WEAKNESSES: No digitally controlled settings for memory storage of parameters. (What, am I supposed to remember where I set the knobs?)

PRICE: $1999 **EQ FREE LIT. #:** 136

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EQ

COMING UP IN JUNE

BLINDED BY SCIENCE?
Electronic music legend Thomas Dolby gets grilled by EQ's own FezGuys as they pick his brain to find out what innovative ways he is using the Internet to further his — and other's — musical careers.

PRE-VIEW.
The mic preamp craze that started some time back has yet to abate, which is why EQ is offering these looks at many of the most talked-about mic pres — including those from Demeter, ART, JoeMeek, Amek, Peavey, and many more.

BURN YOUR OWN.
With CD-Rs becoming more affordable, EQ presents a special section offering tips on how to use them, reviews of new units, and much more.

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

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JOHN TESH

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apartment in New York City back in 1976 or '77 where I had an (MCI) JH24 multitrack and a Trident Series 70B console. Nowadays the reason I have the studio in my house is that I have a family and it enables me at any time to be with my three-year old or to play basketball with my 15-year old — then I can jump back into the studio. If I am mixing a project, I am not the type of person that stays in the hair of my engineer. After I've tracked a project, I'll turn it over to Ross. When he gets things sounding the way he likes them, he'll call me in the house, I can come into the studio, and we can confer on the mix.

One of my favorite pieces of gear in the studio is the Synclavier. I don't use its sequencer anymore (I use Performer to drive it) but I don't think the quality of that system can never be duplicated — the piano sound is still pretty killer and I like the drums, brass and strings as well. About six months ago I got the Otari RADAR system and it really changed the way I work. I'm not a big fan of recording to hard drive, but the RADAR sounds great. I don't really like to have everybody in the studio sitting around when I'm playing a piano solo or trying out an idea. So my acoustic piano in the studio is always miked and normalled to three tracks of the RADAR system. So I can walk in there, hit Record, and play, and that one take could be what is on the record. That's a nice thing for me rather than to try and re-create that mood I had when I was in the studio at three-o'clock in the morning. We actually take it on the road with us. I'm a back-up freak and we back up to 8 mm EXABYTE and also we have six drives total. So I'll work on three drives and bounce the material over to the other three as a safety.

PRODUCTION NOTES: According to Chris Chandler: In addition to sending MIDI data, the Yamaha Disklavier can also save files in its own format. We can have John record a file back at the studio when he has the time and the Disklavier can play the file back at any time later on. This allows us to run the file and have the piano play itself while we're miking it — we don't need John or someone else to sit there and play while we work on the sound. We also have (on occasion) used the Disklavier to play itself along with the band for a few songs at soundcheck while getting the monitors set up. EQ

BEN VAUGHN

continued from page 74

of the confines of the space and situation. The amount of time I was actually able to spend was dictated by the fact that I was in a driveway, with kids coming home from school every day. They would start hassling me, so I had to get out of the car before they got home. Which was fine with me anyway. It gets pretty claustrophobic in there. Most of the tracks were first takes, just so I could get the hell out."

With just seven tracks at his disposal, Vaughn has learned to budget wisely. "I usually put the drums on tracks 7 and 8. I'll have the kick and cymbals on one of those and the snare on the other track, in case I want to process it separately." Bass goes on track 1, so that the dysfunctional track 2 can act as a guard band. The remaining tracks were divided up as needed among vocals, guitars, percussion, and keyboard parts played on Vaughn's old Sequential Circuits Six Track, Casio PT-80, and MT68. Only a few songs involved bouncedowns. "On 'Seven Days without Love,' " says Vaughn, "I recorded drum machine, bass and two acoustic guitars, then bounced all that down to two tracks and recorded the rest on the five remaining tracks."

THE HOME STRETCH

Once all the tracks were recorded, Vaughn took all his audio gear out of the Rambler and set it back up in the house for mixing. "Mixing the record was interesting," he says, "because I didn't really realize what I had until then. And it sounded good. The stuff was cutting through, just the natural frequencies. I didn't really have to do too much doctoring."

The only additional equipment Vaughn added to his setup for the mix was a dbx 163X compressor, added to vocals via a mixer channel insert point, and an Alesis Midiverb. Echo effects during mixdown were provided by Vaughn's trusty Ibanez AD9 delay pedal.

"If you pay attention, you don't need a lot of equipment to do a good record or a good mix," the artist concludes. "I think it has a lot to do with having real songs. That helps. The most time I spent on this record was writing the songs. When you have songs that you know are finished and a clear idea of how they should sound, then cutting them is not that big a deal." EQ

World Radio History

Save What You Store

Where are you putting your valuable studio masters?

BY MARTIN POLON

Nothing is more annoying, confusing, or potentially expensive than the burden of storing finished masters from a recording project. Ideally, the client or artist involved in a session will keep either the digital copies of the session or the digital original once the evolution is finished. It is usually not the legal responsibility of the studio involved to provide safe storage. Unfortunately, since the advent of lacquer masters for 78 RPM records in the 1940s, storage of masters has frequently become the de facto responsibility of the studio where work on the project takes place. Clients, agents, and/or record label A&R people just leave completed masters and/or copies with the studios.

Another variation on this theme is the number of unfinished recording projects that a studio is more or less obligated to store awaiting the reincarnation of the project in question. In both cases, while it is not absolutely clear as a "letter of the law" for studios to store such materials safely, there is no question that improper storage or even relegating the materials to the dreaded "circular file" could and probably would result in some truly nasty litigation!

The growing range of storage media from digital and analog recording sessions can include, but is not limited to, Philips analog cassettes; Philips DCC digital cassettes; Sony Mini Disc; 1/4-inch open reel, 1/2-inch open reel, 1-inch open reel, 2-inch open reel (all either analog or digital); DAT; CD-R; computer optical recording media; Zip/Jaz drives; SyQuest drives; portable hard drives, and even the lowly floppy disk among other options.

In general, all of these storage media have varying long-term storage requirements, but it is usually safe to say that they need to be warm (but not too warm), dry (but not too dry), and devoid of magnetic fields and static electricity — not to mention lightning!

What one finds via a recent survey of large and small recording facilities plus personal and project studios is that these relatively valuable and frequently irreplaceable completed or partially completed projects end up in desk drawers, file cabinets, shelves (wooden and metal), closets, garages, spare bedrooms, under beds, in cardboard boxes laying on floors in corners of recording rooms or mixing booths, and so on. The media are in file folders, plastic "Zip-Loc-type" bags, the original packaging they came in, Xerox-type copy paper boxes, paper bags from hamburger take-outs, supermarket plastic sacks, etc., or any combinations thereof.

The most valuable result of any recording facility is frequently shoved away as a storage nuisance.

In short, the most valuable result of any recording facility is frequently shoved away as a storage nuisance. There are better and more reliable ways to store these projects either in-house or off premises.

1. The "bugaboo" raised most often is the specter of partial or total erasure by various and sundry magnetic fields in the studio or in its immediate vicinity. In fact, several studies have shown a reasonable resistance to erasure by computer magnetic media — with computer media frequently used for storing digital audio being similarly resistant according to some scientists. The head contact to recording surfaces in these computer-based formats tend to be so close in tolerance that most magnetic fields in casual contact cannot achieve permanent impact.

Yet, there is a strong body of anecdotal "evidence" that telephones, refrigerators (or is that refrigerator magnets), vacuum cleaners, hair dryers, television sets, computer monitors, and airport X-rays can and have erased various kinds of magnetic media. It is difficult, if not impossible, to sort out what is real and what isn't. In addition, audio cassettes and open-reel audio tapes have suffered demonstrably from casual fields, and since other environmental issues have to be heeded, safe storage makes sense.

2. In-house storage can be handled affordably with a designated closet or small room that has no heat or magnetic field producing environments on the other side of the connecting walls. Either shelves can be used with the original packaging for the media (which is designed for safe storage), or special file cabinets that are both fire resistant and magnetic-field resistant. There is a range of plastic sleeves available for such storage that keep the media environmentally safe — or at least as safe as one can within a studio facility.

3. Traditionally, both in terms of ease of ensuring such stored materials and for reasons of temperature and humidity regulation, security, and fire protection, many large and small entertainment companies store their masters in former salt or metal mines or similar facilities. The reliability of such storage has been well proven through the years, and some large companies even maintain duplicate computer facilities within these spaces to back up their corporate sites in case of catastrophe.

Recently, however, one of these "safe storage" providers had a fire in a facility. That makes the ultimate disposition of valuable media a judgment call. Certainly, insurance rates for such out-of-studio storage will go up. Nevertheless, the cost of insurance and overall reliability is still significantly better than with in-studio storage. And it seems clear that the likelihood of a repeat catastrophic occurrence at a safe storage center is very low! EQ

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Farm Animals *And The Law*

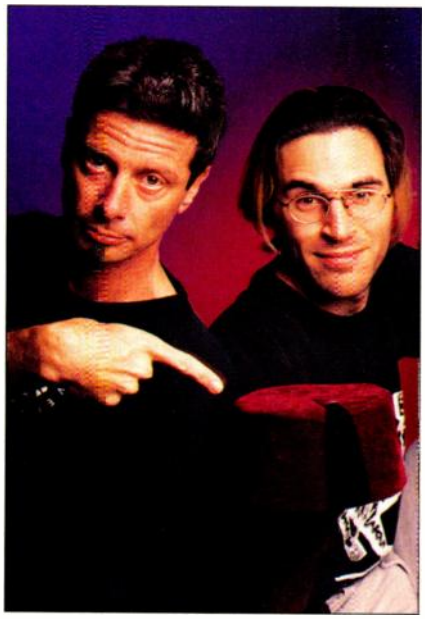

PHOTO BY STEVE JENNINGS

How to protect yourself in the "easily borrowed" domain of the Internet

BY JON LUINI AND ALLEN WHITMAN

Now for a little straight talk on an extremely curvaceous subject: The Law. We're going to give you a glancing overview of some of the publishing and copyright issues as they relate to your music on the Web. You have the same rights as a participant (producer, enducer, etc.) in the World Wide Web that you have as a participant in the traditional world. How can you protect yourself from someone stealing your stuff and making money on it? First, we define our terminology.

Copyright: The legal right to exclusive publication, sale, or distribution of music.

Publishing Royalties: Whoever gets paid (receives "royalties") for the legal right to use of the music in any medium is said to own the "publishing."

Writing Royalties: Whoever is being credited with authorship of the music is said to be the "writer," and stands to receive royalties.

Mechanical Royalties: Relates to the sale of (and profit from) actual physical product.

It is accepted wisdom that the last thing the artist does, if they do it at all, is legally protect their work. Who in their right mind wants to leap headfirst into the awful, stilted language of the law? So let's get wrong for a second and go against our nature. What's the point, you ask? Why should you care? Well, you want to quit your day job, don't you? So get up and out of bed. Nevermind about the soup. It's spring. Make some coffee. It's time to copyright. It's past time.

The procedure for Web content copyright is identical to the procedures used in the traditional world. These are well known. If the decoding of these procedures seems a daunting and labyrinthine task, just remember these wise words first heard by the FezGuys while being bounced on the laps of our FezFathers: "The way to eat an elephant is in small bites."

Not to burst any bubbles, but being legally signed, sealed, and delivered is no guarantee against theft. Contracts and legal documents are essentially magic spells that, merely by their existence, tend to head off the likelihood of conflict. "An ounce of preparation..." For more tangible protection, LiquidAudio and Waking Dreams' SoundStream are designing software to do file identification. This is called "watermarking." In the event that you are ripped off, this technology allows for identifying the files' owner. This is particularly useful if you suddenly find that your amazing new song was purchased online by one person who gave it (for free!) to two friends, who gave it to two friends, and so on. Watermarking also tends to include some protection that prevents the soundfile from being played on a computer other than the one owned by the buyer. This is the new age of protecting your song in this strange emerging world.

At this point, you are likely considering that all-important question: How can *you* make money on it? For the answer to this question, we're going to defer you to a future FezGuys column in which we will discuss some of the current ways to sell your music online. Think of it as another month to prepare your songs for placement on the Web.

It's common knowledge that the most successful (in terms of buying and selling) contemporary pop music is at least partially (and, more often than not, completely) derivative. A precedence exists for the apparent necessity of some frame of reference for popular acceptance. Enthusiastic embracing of groundbreaking new music by hordes of people tends to come only with that slight tweaking of the accepted language. That little tweak that makes your stuff different; but not too different. The business of popular music has a very thin envelope that purports to welcome pushing, but only by a small amount and only into recognizable shapes.

So, because of this derivative aspect, there will be some plagiarism of existing material. The word plagiarism comes from the Latin "plagiarius" (to plunder). It's natural. Humans have been doing it since the beginning. But in the jurisprudence of artists rights, either you wrote it or you didn't. It's black and white. But can you prove it? Funny how if someone steals our stuff and uses it on a very small scale it's a compliment and even a little amusing. But if that same person steals our stuff and makes big money on it...well, that's different.

When it comes to music and musicians, there are many shades of gray. In some communities this plundering is a validation. Imitation is the sincerest form of flattery. Tapers (those who record live shows and trade them throughout a complex and far-reaching network) at a show are seen by some artists as a thumbs-up for their work. Of course, they are also seen by some music business employees as the Wicked Witch of the West — the personification of pure evil. Whichever path you take, remember to make good music.

You should realize that this is a new (and for the most part untested) frontier for music rights. There have yet to be those first landmark courtroom dramas that will set the standard for the specific ways the law looks upon online rights. Take a few moments every few months to update yourself on important

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THE BEST KEEPS GETTING BETTER

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

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

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

World Radio History

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www.youngchang.com/kurzweil

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developments, and you'll be in good shape to relax with your mug of soup or cup of coffee while others scramble around like chickens with their legal rights cut off. We've included some online sites you can (and should) check out below.

List of Resources for Musical Copyright Law:

- **http://lcweb.loc.gov/copyright:** The United States Copyright Office of The Library of Congress. The Government. They're here to help you.
- **http://www.music-law.com/:** A very practical Q&A series. Recommended.

A couple of sites to check out for cool integration of audio within a story are **www.cyclopsboy.com/** and **www.lvli.com/adam/.** EQ

Item! The FezMessage has been modified! Go to http://www.fezguys.com/ and click on the text to hear the new set of urgently important instructions! Go! Go now! Hurry!

THINGS THAT ARE NEW

Nothing. Absolutely nothing happened this month. The development of the World Wide Web has come to a complete standstill. OK, that's not true. LiquidAudio announced a technology partnership with Progressive Networks to support the RealMedia architecture — an open standard for delivering multimedia content over the Internet. It's a cool thing to have two companies that some perceive as competitors working together to standardize and improve the way multimedia content is streamed.

We FezGuys were happy to learn that Microsoft, in the process of developing NetShow (its new multimedia streaming system), has not spent the entire annual budgets of several Caribbean nation-states on proprietary audio and video codecs. They have been kind enough to ride the horse in the direction it's going and, miraculously, haven't ignored the open standards. Intel, VDOnet, MPEG, JPEG, and many other codecs are represented and, in a seeming fit of tyrannical benevolence, they have actually solicited for recommendations from the hoi polloi as to which codecs they (MS) might have overlooked. Surprisingly enough, this is happening at the same time that Microsoft's browser (Internet Explorer) is going to be released for UNIX. Does this signal a kinder and gentler turn for the lurching software behemoth? Or maybe an attack of common sense? For more useful information go to http://www.microsoft.com/netshow/.

What else is new? Sophisticated marketing campaigns. Watch this space. Most streaming media technology companies are busy improving the backend (the server-end as opposed to the client interface) and thereby creating more stable versions of existing applications.

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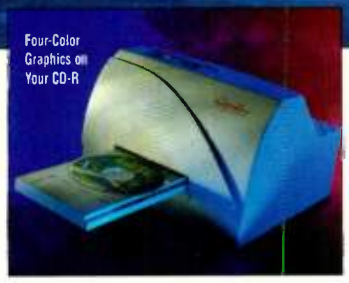

Red Roaster is the first Windows based package that edits PQ subcodes and sets index/track numbers, pause, start time and emphasis.

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PRO CASSETTE DECKS

TASCAM

202 MKIII / 302

Provides high-fidelity sound reproduction and a wide frequency response, as well as a host of features to help you easily dub, edit, record or playback using 1 or2 cassettes.

- Dual Auto Reverse, Normal and high-speed dubbing.
- 4-second autospacer.
- "Dolby HX Pro" extends high frequency performance and minimizes distortion.
- Auto sensing forNormal, Metal and CrO2 tape.
- Functions like Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks you want.

302 *Advanced Features*–

The 302 is 2 independent decks, each with their own set of RCA connectors, transport control keys, auto-reverse, and noise reducing functions.

- Individual/simultaneous record capability–both decks
- Cascade and Control I/O let you link up to 10 additional machines for multiple dubbing or long record and playback.

112MKII/112RMKII

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

112R MKII *Advanced Features*–

- Three-head transport with separate high-performance record and playback heads.
- Precision FG servo direct drive capstan motors.
- Hysteresis Tension Servo Control (HTSC)VIRTUALLY eliminates wow and flutter by maintaining consistent back tension on the tape all through the reel.
- Auto Reverse mode plays or records in both directions.
- Continuous Reverse mode allows you to loop the tape during playback up to 5 times, or record in both directions.

HEADPHONES

AKG

K240M

The first headphone of choice in the recording industry. A highly accurate dynamic transducer and an acoustically tuned venting structure produce a naturally open sound.

- Integrated semi-open air design.
- Circumaural pads for long sessions.
- Steel cable, self-adjusting headband.
- 15Hz–20kHz, 600Ω

SENNHEISER

HD 265/HD580

The **HD-265** is a closed dynamic stereo HiFi/professional headphone offering high level background noise attenuation for domestic listening and professional monitoring applications.

The **HD 580** is a top class open dynamic stereo HiFi/professional headphone that can be connected directly to DAT, DCC, CD and other pro players. The advanced design of the diaphragm avoids resonant frequenciesmaking it an ideal choice for the professional recording engineer.

marantz

CDR615 / CDR620 Compact Disc Recorder

Both next-generation stand-alone write-once CD recorders they offer built-in sample rate conversion, CD/DAT/MD/DCC sub-code conversion, and adjustable dB level sensing. Additional features include adjustable fade in/fade out, record mute time, and analog level automatic track incrementing. A 9-pin parallel (GPI) port and headphone output with level control are also included.

CDR620 *Additional Features*–

- SCSI-II Port • XLR (AES/EBU) Digital In/Out and Digital cascading
- 2x speed recording • Index Recording and playing*
- Defeatable copy prohibit and emphasis*
- 34 key, 2-way wired remote (RC620)

*Available on CDR615 w/optional Wired Remote (RC620)

PMD Series

Portable Professional Cassette Recorders

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

- All models except the PMD-430 have 1/2 speed playback/record capability. With 1/2 speed playback, musicians can slow down complicated passages for analysis. At 1/2 speed the pitch is lowered by exactly one octave so the notes are still musically correct.
- By recording at 1/2 speed, a three hour meeting can be recorded on a single tape. A built-in mic and automatic level control make operation simple, and built-in speaker makes transcription convenient.
- Three standard 'D' cell batteries provide up to 7-1/2 hours of operation and the optional RB430 rechargeable battery delivers up to 5-1/2 hours.

General	PMD-101	PMD-201	PMD-221	PMD-222	PMD-430
Stereo/Mono	Mono	Mono	Mono	Mono	Stereo
Heads	2	2	3	3	3
Inputs/Outputs					
Mic Input	1/4-inch	Miniplug	Miniplug	Mini/XLR	1/4-inch
Condenser Mic	Built-In	Built-In	Built-In	Built-In	—
Remote Jack	—	Yes	Yes	Yes	—
Modular Tel. Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR/Hx NR	—	—	—	—	Yes
Mic Attenuation	—	0,-10dB, -20dB	0,-10dB, -20dB	0,-10dB, -20dB	0,-15dB, -30dB
Ambient Noise Cont.	—	Yes	Yes	Yes	
MPX Filter	—	—	—	—	Yes
Manual Level Control	—	Yes	Yes	Yes	—
Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pitch Control	±20%	±20%	±20%	±20%	±6%
Bias Fine Adj.	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

Telex

ACC2000/4000 Cassette Duplicators

Designed for high performance and high production, Telex duplicators offer easy maintenance and operation. The ACC2000 is a 2-channel monaural duplicator, the ACC4000 is a 4-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!

ACC2000XL / ACC4000XL

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

Easy Maintenance:

- Slanted work surface and "heads-up" cassette platform prevent oxide build up on the heads and makes cassette loading and unloading easier.
- 3 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. A switch on the back engages the head and pinch roller for convenient cleaning.

Fingertip Operation

- Individual rotary audio level controls, "Peak" LED indicators
- Side A or A/B select button
- Stop all tapes instantly, at any point during the copy or rewind cycle.
- Short tape indicators alert you if a tape stops before the original does, identifying incomplete copies caused by jam or short.
- Automatic or manual selection of rewind and copy operation:
  –Rewinds tapes to the beginning or end automatically (AUTO mode) or manually.
  –In AUTO mode the copy button activates the entire rewind/copy/rewind sequence. In manual mode, it starts copying immediately.

Telex Copyette EH Series Duplicators

The Copyette series produce high quality, low cost cassettes in large quantities at approximately 16X normal speed. The 2 versions are capable of duplicating either 1 or 3 cassettes at a time. Available in both mono and stereo.

Stereo Copyette 1•2•1

Weighing only 8 lbs. (3.6 kg), this unit has a durable, impact resistant housing and includes a removable power cord, carrying handle and protective cover. Optical, non-reflective end-of -tape sensing system provides gentle tape handling.

Stereo Copyette 1•2•3

This duplicator copies both sides of three cassettes at once, yet it's as small as the 1•2•1. It weighs only 12 pounds (5.4 kg) and includes a hard cover to protect the unit while not in use. It uses all DC Servo motors for the ultimate in reliability.

MICROPHONES

AKG

C414B/ULS

A reputation for flawless performance and uncommon flexibility in the most demanding studio and concert sound applications.

- Dual 1" Gold-sputtered diaphrams.
- Flat on-axis response.
- 126dB dynamic range.
- Switchable 10dB and 20dB pad.
- 20Hz–20kHz.

CAD

Studio Condenser Mics

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

E-300

A multi-patterned side address mic that combines vintage capsule design with advanced head-amp electronics, the E-300 has an unusually wide frequency response of 10 Hz to 20 kHz and an exceptional dynamic range of 137 dB. Also extremely low self noise of 11dB. Ideal for the most critical applications.

Shown with optional ZM-1 Shockmount

Unique powering of all mics is accomplished with a pair of rechargeable nicad 9-volt batteries in combination with 48-volt phantom power. This overcomes inherent current limiting associated with most phantom power supplies and can supply 10X the current.

E-200/E-100

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

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

audio-technica.

AT4033

Cardioid Capacitor Microphone

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

- Gold-plated, "aged-diaphragm" condenser element with internal baffle plate to increase S/N ratio which, coupled with low-noise transformerless electronics, makes the AT4033 ideal for critical digital recordings.
- Dynamic range is 123 dB without built-in attenuator.
- Accepts up to 140 dB SPL without distortion above 1% T.H.D. A built-in switchable 10 dB (nominal) pad increases it to 150 dB.
- Internal open-cell foam windscreen.
- Integral 80 Hz hi-pass filter for easy switching from a flat frequency response to a low-end roll-off.

AT4050/CM5

The AT4050 multi-pattern condenser expands upon the AT4033 to set the standard for studio performance mics.

- 2 capacitor elements.
- Cardioid, Omnidirectional, and Figure 8 polar pattern settings.
- Vapor-deposits of pure gold on specially-contoured large diaphragms are aged through 5 steps to ensure optimum characteristics over years of use. Transformerless circuitry results in exceptional transient response and clean output even under extremely high SPL conditions.

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MDX 1200 Autocom

- Attack/Release times, with Intelligent Program Detection.
- Noise gate, switchable Soft Knee/Hard Knee characteristics for varied sound pressure levels.
- Bright, illuminated LEDs show gain reduction.

MDX 2100 Composer

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

APHEX

107 Tubessence
2 Channel Mic Preamp

The 107 delivers outstanding sonic performance, as well as a great degree of presence, detail, openness and image.

- 2 independent channels with front panel XLR inputs
- Up to 64dB of gain available
- 20dB pad with red LED indicator, 2 LED input meter
- Full 48V phantom power with red LED indicator
- Low cut filter with red LED indicator: 80Hz, 12dB/octave
- Polarity inversion switch with LED indicator
- Individual channel remote mute capability
- Switchable +4dB/-10dB output with 1/4" TRS phone jacks

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

109 Tubessence
Parametric EQ

The Aphex 109 is an extremely versatile and high performance parametric vacuum tube EQ with unique features flexibility and sound.

- **Great for "warming up" digital signals.**
- True tube circuitry in the output stage.
- Dual (stereo) 2 band or mono 4 band EQ configuration offers flexibility from general sweetening to critical problem solving.
- Operates in the EQ flat mode yet still passes signal through the Tubessence vacuum tube stage.
- 1/5 octave to 2 octave bandwidth adjustment.
- Switchable -10dBV/+4dBu operating level.

t.c.electronics

Wizard M2000
Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and 6 different routing modes. There are 250 factory programs including reverb, pitch delay, chorus, flange, phase, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit A/D 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.

HIGH-END MIC PRE-AMPS

Focusrite

Red 1 / Red 8 Mic Pre-amps

The Focusrite Red Series is instantly recognized by leading engineers worldwide for its fidelity, musicality, precision and control. The Red1 is a 4 channel mic pre while the Red 8 has 2 channels. Both are ultra-high quality for use in digital recordings, and with high-quality ribbon, valve, and condenser microphones.

Each channel offers–

- Phantom power & Phase reverse.
- Warm, and crystal-clear.
- Easy-to-read, accurate illuminated VU meters.
- Low noise floor with high gain bandwidth.
- Mic gain has 66dB range.

ISA 215 Dual Mono Mic-Pre & EQ

Engineers, producers, and musicians worldwide are familiar with the legendary ISA 110 mic pre/EQ that forms the heart of the Focusrite Studio Console. Frequent requests for a 19" rack unit with the same circuitry have led to the development of this high-quality studio device.

- 2-independant mic pre-amp & EQ.
- Microphone inputs feature variable gain and switchable phantom power.
- Independant HF and LF shelving sections.
- Overlapping Upper and Lower Mid EQ w/variable bandwidth.
- Independant High and Low pass filters.
- Integrated PSU
- Large, easy to use control knobs and switches.

Focusrite Green Range
NOW AVAILABLE!

ALESIS

3630 Compressor RMS/Peak 2Ch.Comp/Limiter/Gate

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

M-EQ 230 Dual 1/3 Octave/Precision Equalizer

Used extensively in recording studios since 1989, the M-EQ 230 provides 2 independent 30-band 1/3 octave graphic EQ's in a single rack space. Covering every band from 25 Hz to 20 kHz in 1/3 octave increments the M-EQ 230 is ideal for tuning the monitors in your project studio or even getting the most out of a home stereo setup.

MidiVerb 4 2 Ch. Parallel Processor w/Auto Level Sensing

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

- Wide variety of dense, natural-sounding reverbs, rich chorus and flange, versatile delay, rotating speaker simulation, pitch shift, panning and more.
- Auto Level Sensing feature automatically sets your input signal to the optimum level to take advantage of the MidiVerb 4's wide dynamic range.
- 18-bit oversampling digital converters add to the excellent audio fidelity, with a resulting 20 kHz frequency response and a dynamic range over 90dB.
- 128 preset and 128 user-editable programs.
- Mono or Stereo single effects, dual-mono effects, and multi-chain configurations for 2 or 3 effects at once.

QuadraVerb 2 2 Ch. Master Effects w/Digital I/O

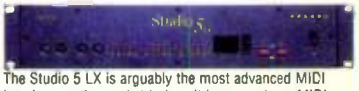
Alesis' most powerful signal processor, the QuadraVerb 2 offers the amazing audio fidelity of a high-end dedicated vocal reverb while providing powerful multi-effects capabilities.

- 300 programs (100 preset and 200 user-editable).
- Octal Processing allows use of up to 8 effects simultaneously in any order. Choose between over 50 different effects types for each block, including reverb, delay, chorus, flange, rotary speaker, pitch shift, graphic and parametric EQ, overdriver and more.
- 5 seconds sampling, triggerd pan, and surround sound encoding are also built in.
- Selectable -10 dB and +4dB levels, servo-balanced TRS inputs and outputs.
- ADAT Digital Interface allows you to work entirely in the digital between the Q2 and an ADAT XT.

MIDI

OPCODE

Studio 5 LX
Macintosh MIDI Interface



The Studio 5 LX is arguably the most advanced MIDI interface on the market today. It incorporates a MIDI patchbay, MIDI processor, and SMPTE synchronizer with it's interface functions, all in a 2 rack space unit.

- 15 Independant MIDI ins and outs.
- SMPTE reads and writes all formats– 24, 25/29.97/29.97DF/and 30.
- Network multple units, 240 MIDI channels each.
- 128 patches, unlimited virtual instrument controls.
- 2 assignable footswitch inputs, 1 controller input.
- 8X speed when used with OMS.
- Internal power supply.

Studio 3 & 4 MIDI Interfaces, and Vision sequncing software also available.

Mark of the Unicorn products now available.

PROCESSING

White instruments

4200A, 4400 & 4700
L-C Series 1/3 Octave Active Equalizers

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

The **4700** is similar in specifications to the 4200A/4400 EQs, the difference is that all functions of the 4700 are digitally controlled.

DSP 5024
Digital Signal Processor

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

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STUDIO MONITORS

JBL

Control 5
Compact Control Monitor Loudspeaker

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

- 6-1/2" low frequency driver provides solid, powerful bass response to 50 Hz and a pure titanium 1" dome handles high frequency response to 20 kHz.
- Magnetically shielded for use near video monitors.
- Choice of black, gray or white finish.
- A host of mounting systems including ceiling, rack and tripod allow positioning in exactly the right spot.

4200 Series
Near-Field Monitors

The 4200 Series near field monitors come in 6.5"(4206) and the 8" (4208). Both offer exceptional sonic performance, setting the standard for today's multi-purpose studio environment.

- Multi-Radial baffle directs the axial output for optimum summing at approximately 3 to 5 ft.
- Curved surface of the ABS baffle virtually eliminates baffle diffraction distortion.
- Superb imaging and greatly reduced phase distortion.
- Vertical alignment of the transducers across the baffle center produces natural mirror-imaging.
- Pure titanium diaphragm high frequency transducer provides smooth, extended response.
- Magnetically shielded for use near video monitors.

6208
Near-Field Monitors

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

- XLR or 1/4" inputs are compatible with both -10 dbV and +4 dBu nominal operating levels.
- 2.6 kHz electronic crossover with discrete circuitry.
- Low feedback design, with no slew rate limiting and extremely low distortion.
- 8", 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.

MIXING BOARDS

BEHRINGER

EURODESK MX 8000
24 Channel 8-bus Console

- 48 input channels with dedicated EQ, Mute, Pan, & Level.
- Channel, Subgroup, and Mix insert points.
- Direct Outputs, 24 balanced tape ins/outs.
- 4 band EQ with sweeps.
- 6 Aux sends, 6 stereo Aux returns w/extensive routing.
- Optional **MB-8000** Meter-bridge.
- Optional Cybermix automation software for Windows.

MACKIE.

CR-1604 VLZ
16-Channel Mic/Line Mixer

A hands-down choice for many major touring groups and studio session players as well as broadcast and sound contracting. The CR-1604 VLZ features everything you would expect from a larger console, and then some!

- 24 line, 7 AUX, 3-band EQ w/ mid sweep, 10-segment LED output meter.
- 90 dB S/N and 108 dB dynamic range.
- 16 studio-grade, phantom powered mic preamps.
- AFL/PFL solo & mute w/ overload and signal indicators.
- Rear panel features 1/4-inch/ XLR connectors, inserts on every channel, and RCA tape inputs/outputs.
- Rotary I/O "pod" allows3 different positions for set-up.

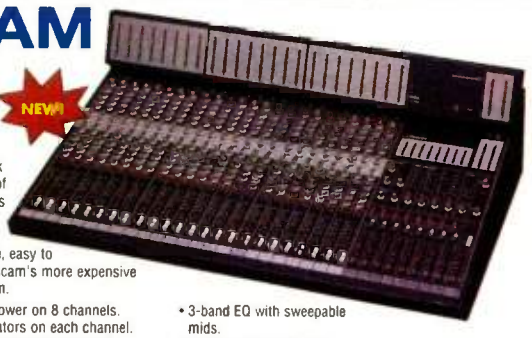
MS1202VLZ and MS1402VLZ *IN STOCK!*

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

TASCAM

M-1600
16/24 Channel 8-bus Console

NEW!



Great for modular Digital Multitrack setups and hard disk recording, the M-1600 is part of Tascam's next generation series of recording consoles. It features multiple option for inputs and outputs and uses the same, easy to install D-sub connectors as Tascam's more expensive console, all in a compact design.

- XLR Mic inputs w/phantom power on 8 channels.
- Signal present/overload indicators on each channel.
- Balanced/Unbalanced tape returns and Balanced Group/Direct outputs using D-sub connectors.
- TRS Balanced Line Inputs on all channels.
- 3-band EQ with sweepable mids.
- 5 Aux sends (1 stereo)
- 4 assingable aux returns.
- Perfect for use with DA-88 and ADAT setups.

Digital Multi-Track Recorders

TASCAM DA-88

- Hi-8mm tape format.
- ATF system ensures no tracking errors or synchronization loss on up to 16 cascaded decks.
- 16-bit D/A, selectable 44.1 or 48KHz.
- Flat 20Hz to 20KHz, 92dB dynamic range
- Seamless Punch-in and out, for programmable digital crossfade and insert.
- Individual track delay for special effects and timing correction.

SONY

PCM-800 Digital 8-Track In Stock!

ALESIS **adat *xt***

S-VHS DIGITAL

The ADAT-XT sets the standard in modular digital multitrack recording. The ADAT-**XT** operates up to four times faster than the original ADAT and offers an intelligent software-controlled tape transport as well as provides onboard digital editing and flexible autolocation.

- IncludesLRC remote control with transport and locate functions
- Advanced transport software continuously monitors autolocation performance.
- 56-pin ELCO connector operates at +4dB and -10dB
- Built-in electronic patchbay
- Flawless copy/paste digital edits between machines or within a single unit.

STUDIO MONITORS

ALESIS

Monitor 1
Near Field Reference Monitors

- 6.5" low frequency driver provides 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.

Monitor Two
Mid Field Studio Reference Monitors

Today's popular music demands more bass at louder volumes than a small near field monitor can possibly produce, the Monitor 2 delivers.

- 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.
- 5" mid frequency driver offers exceptional mid frequency detail
- 1" silk dome high frequency driver delivers a broad but natural frequency response from 40Hz to 18kHz.
- Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy.

Point Seven

NEW PRODUCT

- Shielded reference monitor.
- Front ported venting system for great bass response.
- 50 watts RMS– 100 watts peak @ 4Ω.
- 85Hz–27kHz, ±3dB.
- 2kHz crossover for accurate phase and a wide "sweet spot" for mixing.
- Accurate flat sound reproduction.
- Great for studio and multimedia applications.

TANNOY

PBM Series II
Near-field Reference Monitors

The PBM II Series is the industry standard for reference monitors providing true dynamic capability and real world accuracy.

PBM 5 II

- Custom 5" injection-molded bass driver
- Woofer blends seamlessly with the 3/4" polymide soft dome ferro-fluid cooled tweeter providing extended bandwidth

PBM 6.5 II

- 6.5" lowfrequency driver and 3/4" tweeter
- 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 and 8" driver capable of powerful bass extension under high SPL demands.
- Hard wired crossover features true bi-wire capability.
- Full cross-braced matrix medite structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities.

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TASCAM

DA-P1

- Rotary 2 head design and 2 direct drive motors.
- XLR mic/ line inputs (w/phantom powe
- Analog and S/PDIF (RCA)digital I/O
- 32/44.1/48kHz sample rates & SCMS-free recording.
- Built in MIC limiter and 20dB pad
- TRS jack w/ level control for monitoring
- Includes shoulder belt, AC adapter, & battery.

PDR1000/PDR1000TC

- 4 head Direct Drive transport
- Balanced XLR mic and line analog inputs and two RCA analog line outputs. Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU XLR
- Left/Right channel mic input attenuation selecter(0dB/-30dB)
- 48v phantom power, limiter & internal speaker.
- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status, ID number, tape source status and machine status.
- Nickel Metal Hydride battery powers the PDR1000 for two hours, AC Adapter/charger included.

PDR1000TC Additional Features:

- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
- External sync to video, field sync and word sync

STUDIO DAT RECORDERS

FOSTEX

D-25/D-30

- Pro DAT master recorder featuring confidence monitoring and insert editing with a 4-head transport.
- Sync functions include the ability to chase sync to a master timecode. Resolves to WORD/VIDEO/DAT frame signal + WORD.
- Independent left/right recording.
- Scrub from tape or buffer, Jog/ Shuttle 1/2X to 16X.
- SMPTE/EBU TC generator/reader
- On board chase/lock sync, RS-422 slot.
- 4-head 4-motor transport.
- 16 MBit RAM bufferforinstant Start & Edits.

D-30 Additional Features:

- Large, high resolution backlit LCD display which shows all parameters at a glance
- Intuitive menus from 10 dedicated soft keys
- 2/ RS-422 ports for added flexibility.

FOSTEX D-15 TimeCode DAT NOW AVAILABLE!

Panasonic.

SV-3800/SV-4100

The SV-3800/SV-4100 feature highly accurate and reliable transport mechanisms with search speeds up to 400X normal. Both use 20-bit D/A converters to satisfy the highest professional expectations. The **SV-4100** features instant start, program and cue assignment, enhanced system diagnostics, multiple digital interfaces and more.

Roland®

A-90EX Master Controller for the Next Century

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

Keyboard Controls

- Master Volume Slider and Global Transpose features allow you to send control commands to your entire MIDI setup without changing the balance between connected units.
- Sequencer Control Section lets you control song selection, tempo and other parameters quickly.
- The keyboard can be split into eight zones and features 20 different controls and connectors.

Superb Sound

- 2 types of stereo-sampled grand pianos, various acoustic and electric pianos (including a great classic Rhodes).
- 128 patches selected from Rolands extensive "JV" and "JD" series library.
- 64-voice polyphony, Built in effects

Extensive Performance Configurations

- Stores up to 64 Performances,(128 w/optional M-512E card) which may consist of up to 4 preset Patches along with various user-configurable parameters such as zone, effects, and MIDI channel.

88 Key Keyboard

- Proprietary 88-note hammer-action, velocity sensitive keyboard w/aftertouch offers the natural resistance and rebound of an acoustic piano and control of a synth.

JV-2080 64-Voice Synthesizer Module

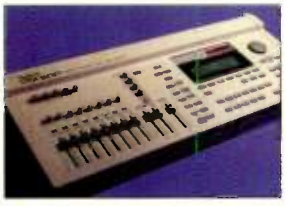
JUST IN

Roland resets the standard with the incredibly expandable JV-2080 64-Voice Synthesizer Module. This amazingly powerful package offers unprecedented expandability, digital signal processing, and remarkable operational ease, all housed in a 2-unit rack-mount design

Features

- 64-Voice polyphony / 16-part multitimbral capability.
- 8 slots for SR-JV80 series expansion boards.
- 3 independant effects sets plus independant reverb/delay and chorus.
- 64-Voice polyphony/16-part multitimbral capability.
- NEW patch finder and Phrase Preview functions for easy access to the huge selection of patches.
- Large backlit graphic display
- Compatable with the JV-1080, XP-50, and XP-80.

NEW SR-JV80-10 "BASS & DRUMS" EXPANSION BOARD NOW AVAILABLE!



DM-800

Digital Audio Workstation

A compact, stand-alone multi-track hard-disk recorder that provides an amazing array of features at an unbelievably low price. Used music production, post production and broadcast, it performs all digital mixing operations from audio recording and editing to rotation track-bouncing and final mixdown. It supports SMPTE and MTC and features a built-in Sample Rate Resolver for sync with any time code.

VS-880 V-Xpanded

NEW PRODUCT

Digital Studio Workstation

The VS-880 V-Studio Digital Workstation, is now even more versatile with the release of the VS-880 V-Xpanded. This new version incorporates powerful additional functions that allow you to get the most out of the VS-880's incredilbe creative potential.

NEW FEATURES

Mixer Section

- Auto Mixing Fuction records and plays back song data in realtime including fader movements and panning positions. No external sequencer is required.
- Easy recording with an inserted effect in "INPUT-TRACK" mode.*
- Process the master output with a specific inserted effect such as total compression.*
- Scene change by MIDI program change message.

Recorder Section

- Simultaneous playback of 6 tracks in MASTER MODE recording.
- Digital output with copy protection.

Effects Section*

- 10 additional effect algorithms (30 total) including Voice Transformer, Mic Simulator, 19-band Vocoder, Hum Cancelor, Lo-Fi Sound Processor, Space Chorus, Reverb 2, 4-band Parametric EQ, 10-band Graphic EQ, and Vocal Cancellor.
- 100 additional preset effects patches.
- Effect change by MIDI program change message.
- Effect edit by MIDI control change message.

And More...

- Additionally, over 20 powerful and convenient features in editing/sync sections have been added.

The functions marked * require the optional VS8F-1 Effect Expansion Board

VS-880-S1 SYSTEM EXPANSION KIT

Current owners of the VS-880 now enjoy unprecedented support from Roland with the release of this System Expansion Kit. Supplied on a ZIP diskand including a new owner's manual, the VS-880-S1 will provide current version users with all of the benefits of the VS-880 V-Xpanded at a fraction of the cost.

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SSHRD-1 Hard Disk Recorder/ Editor

A professional Multitrack Digital Audio Workstation for the PC, the SSHDR1 combines the highest quality processing hardware with easy-to-use Windows-based software for the most complete and affordable solution for high quality digital audio recording and editing on the PC. The SSHDR1 has over 50 powerful editing tools and is expandable from 8 to 128 tracks, with up to 32 inputs and 64 outputs. Ideal for a wide range of applications ranging from, recording music in project studios with an 8 track system, to multiple unit 32, 48 and 64 track systems used by major TV and film studios for audio post productionlinked to video.

- All audio processing, disk handling and sync. is carried out by the powerful DSP in the hardware, so any PC can be used. Even a 386!!!
- Up to 64 virtual tracks all with Move, Copy, Trim, Slip, Solo, Repeat, Delete, Cut Glue edit functions.
- Solo/Multi-track audio scrubbing. 999 named markers
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- Volume and Pan controls, assignable fader grouping.
- Reverse/Phase Invert/Compute tempo.
- Optional Time Module features Time stretch/Time compression Pitch shift and Sample rate conversion.
- 8 physical output channels, selectable for each PART
- Non-destructive sample-resolution editing.
- Cycle record mode with stacked TAKES and pre-roll (like analog multi-track tape recorders)
- **AND MUCH MORE...**

FOSTEX

DMT-8 VL

JUST IN

The latest in the Fostex HD recording family, the DMT-8 VL truely brings the familiarity of the personal multi-trac to the digital domain.

- 18 bit A/D, 20 bit D/A conversion.
- 8 channel mixer, CH. 1&2 feature both mic & line level
- 2 band EQ and 2 AUX sends per channel
- Cut/Copy/Move/Paste within single or multiple tracks.
- Scrub from tape or buffer. Jog/ Shuttle 1/2X to 16X.
- Built-in MIDI Sync., 6 memory locations
- Dual function Jog/Shuttle wheel provides digital "scrub" without pitch change.
- Divide the drive into 5 seperate "virtual reels" each with it's own timing information.
- **NO COMPRESSION!**

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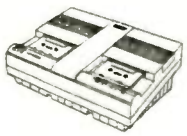

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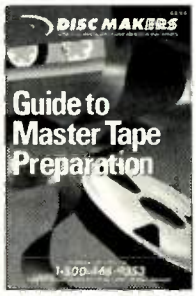

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FIRST LOOK

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move editing, removable front panel that doubles as a remote, and up to 120 minutes of 8-track recording (with 5 GB drive).

The higher-level D-160 is similar to the D-90, but can record 16 tracks simultaneously (8 digital and 8 analog), has SCSI built-in, and includes dual ADAT interfaces to accommodate the 16 tracks. Additional features include eight virtual tracks for doing multiple takes of one or more tracks, and two options: the Model 5041 balanced I/O option with 8 balanced inputs and 16 balanced outputs on three D-sub 25-pin connectors, and the Model 8345 Timecode/Sync Card option that allows chasing to incoming LTC with the option of resolving to video or word clock. For more details, contact Fostex, 15431 Blackburn Ave., Norwalk, CA 90650. Tel: 310-921-1112. E-mail: info@fostex.com. Circle EQ free lit. #137.

SPL MACHINE HEAD: TALE OF THE (VIRTUAL) TAPE

Designed for use with individual instruments or program material, SPL's Machine Head (Model 9737) is an all-digital processor that emulates analog tape saturation effects including hysteresis, harmonic changes, and both linear and nonlinear transform functions characteristic of tape. Subjectively, this results in a louder, "hotter" sound for a given maximum peak level, as well as additional "warmth" due to the saturation effects.

The digital I/O, which automatically handles sample rates from 32–48 kHz, consists of transformer-based AES/EBU XLR connections along with coaxial S/PDIF (outputs are usable simultaneously, and the copy-prohibit flag can be deactivated). Word Clock In and Through BNC connectors are fitted with switchable, 75-ohm termination. MIDI allows for 99 presets to be selected via program change commands, and an RS232 PC interface and RS422 Mac interface are included for future software upgrades.

Controls include input gain for setting overall input levels, drive (controls the recording level of the "virtual tape machine"), high-frequency damping, output gain, and virtual tape speed (emulates the type of saturation characteristic of either 15 and 30 ips tape operation). The bypass is a true, relay-controlled function that diverts AES/EBU signals from the input to output without passing through the processing. Metering is extensive; there are PPM displays for input and output levels, and input clipping (even if not contributed by the Machine Head) will show up in the output metering. A separate Drive level meter displays the "recording level" that is sent to the virtual tape, from –10 to +21 dB.

In listening tests, the Machine Head seemed to come into its own when used subtly; pushing it too hard produces a sound that is just as harsh as pushing analog tape too hard. With moderate settings on program material, there is a definite sort of "warmth" that indeed recalls tape saturation, and even light settings can make a difference with individual instruments. For more information, contact SPL (Sound Performance Lab), distributed by beyerdynamic, 56 Central Avenue, Farmingdale, NY 11735. Tel: 516-293-3200/800-294-4463. Circle EQ free lit. #138. EQ

ACOUSTIC MIKING

continued from page 114

for the send to the stage monitors, giving a more consistent level for the other musicians, while the mic channel can be directed to the FOH mix. You can then use as much or as little of the DI send in the FOH, depending on its sonic quality. This is, in reality, hedging your bet when doing live sound. Unless, however, you're using a DI system that's been totally tested on the full sound system, the slight trouble of hanging an extra microphone is well worth eliminating the possibility of bad sound or pickup failure.

LOWER THE VOLUME

Many former electric artists have a hard time adjusting to the lower stage monitor volumes necessary for acoustic instruments. This is caused both by a preconception that louder is better and hearing loss from years of listening to loud stage amps and monitors. If you turn up the monitors to accommodate the musicians' wishes, the stage bleed from the monitors makes mixing in a small room next to impossible. The best way to eliminate this stage roar is through the use of personal ear monitors for the musicians. These are becoming more popular as artists are expected to match the sonic qualities of their latest CD.

The expense of personal ear monitors, $350 to $700+ per pair for good quality wired units, and up to $5000 per channel for professional wireless units, is comparable to the cost of professional floor monitors and their amplifiers with none of the stage bleed. Great care must be taken, however, to protect the hearing of the musicians, since monitor levels can easily exceed rocket launch levels without the monitor engineer being aware of it. More on this subject in a future article on stage monitoring.

Mike Sokol is a musician, audio engineer, and communications integrator who has written technical and how-to articles for numerous audio magazines. His book,* Sound Advice for the Acoustic Musician, *will be published by Prentice-Hall this fall. You can reach Mr. Sokol at jmsokol@intrepid.net or www.soundav.com. He can also be faxed at 301-791-8146.

FRONTIER DESIGNS

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Otherwise, the current lack of multichannel support means that you're buying the WaveCenter with the future in mind. It's still a pretty good deal right now: the multiport MIDI interface is a nice touch, as are the two flavors of S/PDIF. Besides, how often do you need to edit eight ADAT tracks at once? If you're just cleaning up a vocal track or stereo pair, the WaveCenter does fine. The only alternative would be an adapter box à la DMTi to convert the ADAT digital out to AES/EBU or S/PDIF, and a sound card that can handle stereo digital I/O. The cost of these approximates the WaveCenter's cost, and when multichannel-savvy software hits, you would still be stuck with transferring two tracks at a time.

Bottom line: If ADAT combined with PC editing are in your future, the WaveCenter was made for you. If you need to do ADAT/PC editing today, your options are more limited: use WaveCenter with Saw Plus, or transfer in stereo pairs. All that's needed now is more multichannel support from the software industry — and all indications are that both Samplitude Studio 4.0 and Cakewalk Pro Audio 6.0 will be available very soon, if they aren't already. Frontier Design has cooked up a potent piece of hardware; software with multichannel channel support will be the icing on the cake. EQ

World Radio History

ACROSS THE BOARD

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BACK TO JAPAN TRIP, SO SORRY

The musicians in the band were excellent, the string players were flawless, and the experience was delightful. This could be the easiest record I ever recorded.

Planning ahead helped a lot. I didn't want to ship my Meyer HD-1 speakers to Japan, so I called my friend Mark Johnson at Meyer to see if there were any rental companies in Tokyo that carried them. He called back the next day and said that their Japanese distributor, ATL, would loan me a brand-new pair to use for the project. Cool. I checked the speakers off my list as the easiest part of the job.

I asked the studio in Japan to fax me an equipment and microphone list so I could decide if I needed to rent anything. The list was beyond my expectations, so I wasn't going to need anything additional, well, almost. I like using my Yamaha microphones on drums, but the studio and the rental companies in Tokyo never heard of them (good work Yamaha...), so I decided to bring mine. I put them in little padded zipper cases and threw them (placed them gently) in my carry-on luggage.

The only other stuff I took along was my portable DAT and a pair of headphones so I could listen to rough mixes in my hotel room. Oh, yeah, my wife made me take a change of clothes and some clean underwear and socks. I knew that something should be in my suitcase to protect the electronic gear from damage.

TOKYO BLUE NOTE

On my last night in Tokyo, Mr. Sora (A & R for Sony Japan) took me to the Blue Note to see Ralph McDonald (percussionist) play. His band included Tom Scott (sax & EWI), Rob Mounsey (keyboards), Chris Parker (drums), Abraham Laboriel (bass), Jeff Marinoff (guitar), and Dennis Collins (vocals). I knew all these guys from various album projects over the last 20-some years, including Steely Dan stuff, but it was the first time I ever saw all of them in the same pile. Yeah, that is what it was like in the cramped dressing room after the show, a pile of musicians. When Tom Scott asked me what I was doing in Tokyo, I told him it was cheaper for me to fly to Japan to see them all at once than to fly all around the country to see them individually. Don't tell him why I was really there, I think he bought it. EQ

MAINTENANCE

continued from page 137

and MPEG-2 compression. DVD mastering engineers will decide (in conjunction with software) to raise the bit rate to accommodate detail (fast moving images) and lower it for nearly still images. The target is to squeeze 133 minutes of video down to less than 4 GB — with three channels of audio and four subtitle channels.

NOTE: I extrapolated the four standard disc capacities to data rates that would demonstrate how they might be applied to video projects that demand greater detail using less compression.

When DVD does become available to the audio industry, it will have no problem storing digital audio. Based on the data rate for a standard 44.1 kHz CD (1.41 Mbits/sec), doubling the sample rate to 88.2 kHz will do the same to the data rate (2.82 Mbits/sec). A 73-minute classical recording will take up a mere 1.51 GB of space. With a little imagination, why not 90 minutes of discrete 4-channel audio? C'mon, it's only 3 GB! EQ

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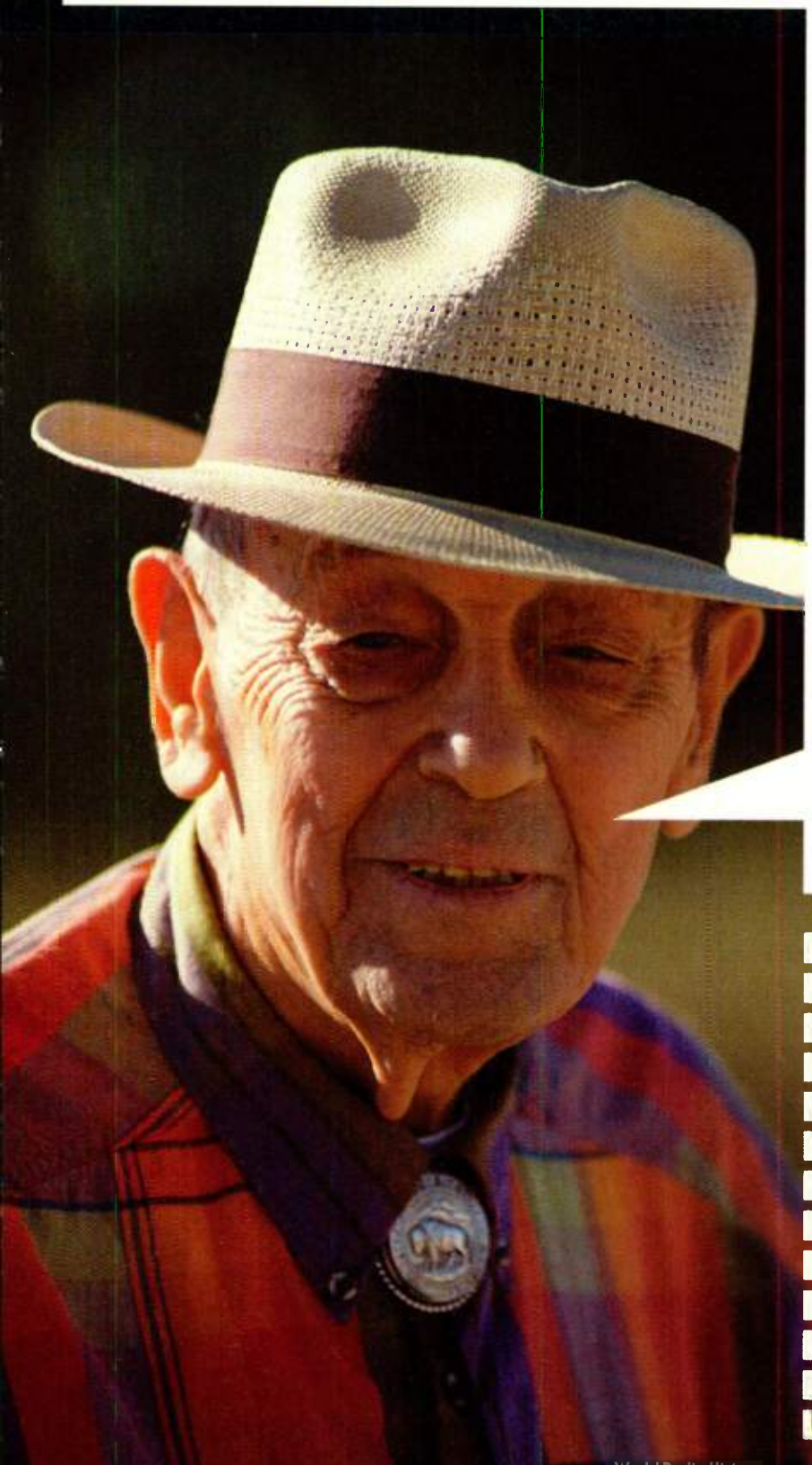

What?! EQ Magazine brought right to your door every month? You kids got it way too easy. In my day, if we wanted **the best in project studio recording gear and techniques plus information for the gigging musician**, we had to walk 10 miles in our bare feet. And do you know what the roads were paved 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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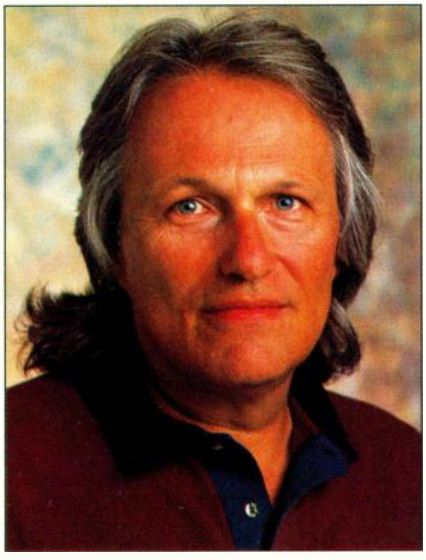
World Radio History

I Think I'm Turning **Japanese**

Breaking the language barrier (sort of) and making music in the Far East

BY ROGER NICHOLS



I am writing this column on United Flight 882 from Tokyo to Chicago. I have been in Japan for the last three weeks working on an album for a Japanese artist named Toko Furuuchi. We cut the tracks and did most of the overdubs at Free Studio Yotsoya. Don't let the name give you the wrong impression though, the studio was far from free. How about $4500 (U.S.) per day! I thought that was amazing for studio rates until the last day when we went to another studio to record the 18-piece string section. The second studio was Tokyufun Studios. So named because it is owned by Fun House Records. Tokyufun was $7500 (U.S.) per day, but of course that price included the Sony 48-track digital machine.

Both studios were very nice. Free Studio had a Neve 72-input VR-P console with Flying Faders to go along with their Sony 3348 48-tracks. The studio was quite spacious, including the control room. I was very impressed with how good the console sounded. I have worked on quite a few 72-input VR Neves, and they all seem to have a pretty high noise floor from all of those channels adding their individual noise into the 2-track bus. Big consoles start getting pretty noisy pretty quickly as the number of faders goes up. This particular Neve is an exception. More than once during the three weeks I thought the monitors were muted until I pressed play on the 48-track and nearly jumped out of my skin.

I could never find out what they did to the console, if anything, because nobody spoke English. Every time I asked a question, the answer was "Hai!" I could figure out changes in the tune because they used pidgin-English for song sections and chord names and I could recognize a few Japanese words from previous projects. Sometimes when I got too confused the producer or the assistant engineer would point to the chart or circle the bars that needed to be punched in.

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The Sony 48-track digital machine was a gem also. Behind the front doors of the machine is a panel of error LEDs that let you know if there are any correctable or noncorrectable errors on the tape. On all of the 48-tracks I have used, there is always a little random activity in the low-level errors. Of the 48 LEDs, usually one flashes every few seconds. On this machine I would see a couple of minutes go by without a flicker. I knew they were working because I could see a little blip at punch-in and punch-out points. I even checked the hour meter, which showed 3420 head hours, so it wasn't a new machine.

In Japan, all of the Sony 3348's have a clear plastic dust cover that is tilted up to change tapes, but always kept down during operation to keep dust away from the tape and the heads. I remember when the 48-track was introduced and Sony offered the dust cover, but no U.S. studios bought any. I know that dust can scratch the oxide on digital tapes and also damage the very expensive digital heads (about $20,000 to replace a set of 48-track heads). After 3000-plus hours of operation, maybe the dust cover on the Japanese machines made a difference.

CLEANLINESS IS NEXT TO DIGITAL-NESS

The same thing can happen to the heads on ADAT- and DA-88-format machines. Have you ever taken the case off of your computer and seen all of the dust that has built up inside? Well, the same thing happens in the 8-track digital machines you use in your project studio. The heads whipping around cause a certain amount of air flow that carries dust right into your machine. This dust scratches the tape and clogs the heads (along with loose oxide from the tape). To help prevent early dust-related problems, follow the manufacturers recommendations for head cleaning, and once every six months to a year you should take your machine in for a professional cleaning. When the machines are turned off, you should keep them covered with a dust cover such as those plastic computer dust covers that are available at computer stores and office supply stores.

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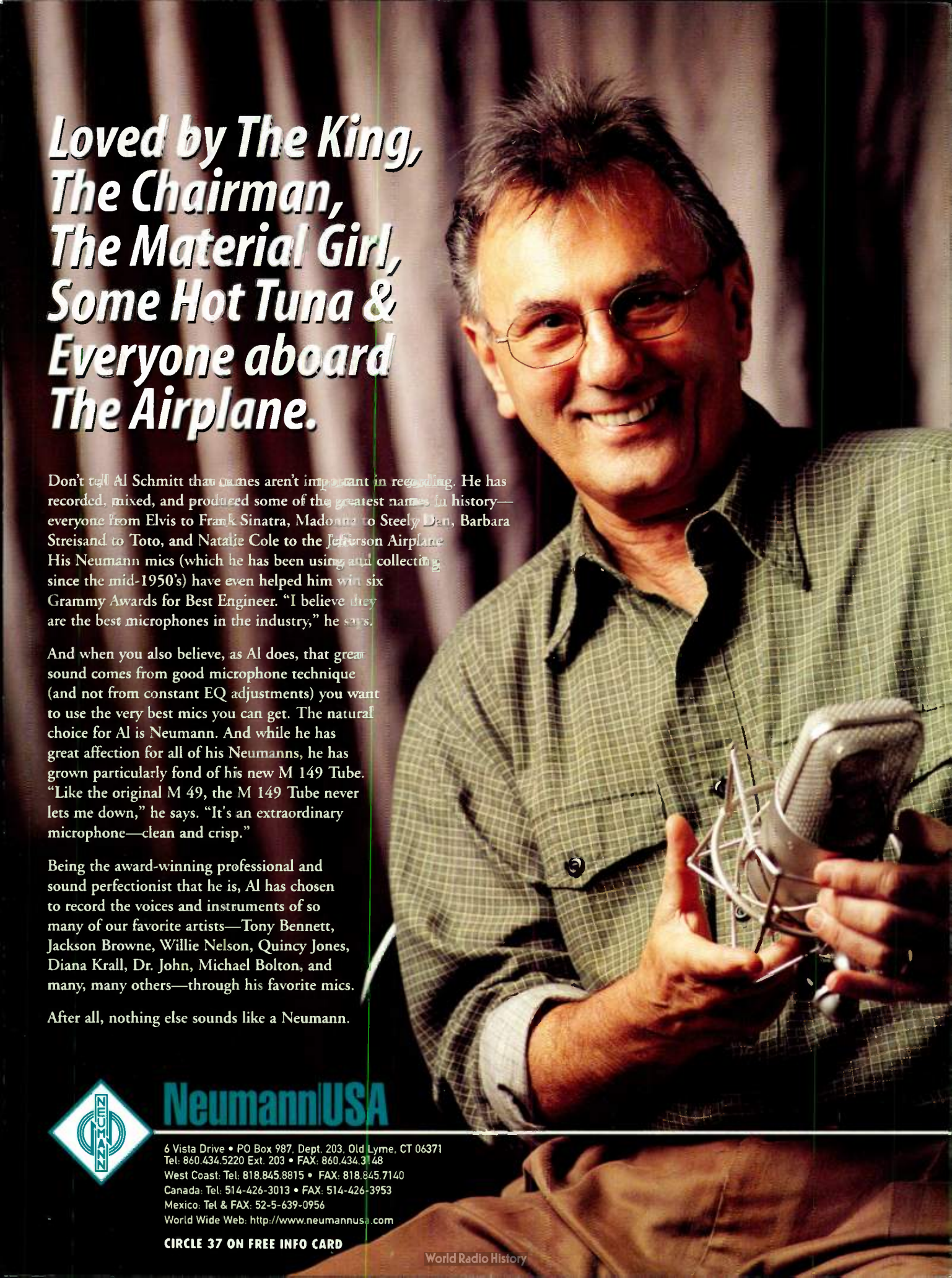

Loved by The King, The Chairman, The Material Girl, Some Hot Tuna & Everyone aboard The Airplane.

Don't tell Al Schmitt that names aren't important in recording. He has recorded, mixed, and produced some of the greatest names in history—everyone from Elvis to Frank Sinatra, Madonna to Steely Dan, Barbara Streisand to Toto, and Natalie Cole to the Jefferson Airplane. His Neumann mics (which he has been using and collecting since the mid-1950's) have even helped him win six Grammy Awards for Best Engineer. "I believe they are the best microphones in the industry," he says.

And when you also believe, as Al does, that great sound comes from good microphone technique (and not from constant EQ adjustments) you want to use the very best mics you can get. The natural choice for Al is Neumann. And while he has great affection for all of his Neumanns, he has grown particularly fond of his new M 149 Tube. "Like the original M 49, the M 149 Tube never lets me down," he says. "It's an extraordinary microphone—clean and crisp."

Being the award-winning professional and sound perfectionist that he is, Al has chosen to record the voices and instruments of so many of our favorite artists—Tony Bennett, Jackson Browne, Willie Nelson, Quincy Jones, Diana Krall, Dr. John, Michael Bolton, and many, many others—through his favorite mics.

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