

Annual *New Gear* Preview

E

PROFESSIONAL
PROJECT
RECORDING
& SOUND

OCTOBER • 1998

Digital
Converter
Special

In Review

Cool Edit Pro

Lexicon Studio

Symbolic Kyma

Behringer
Virtualizer

Allen & Heath
GS3000

True Systems
Mic Pre

*Brian Wilson
Stretches The
Imagination*

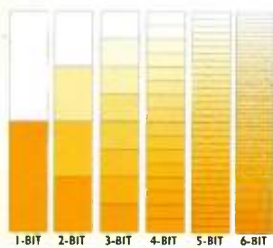
In My Room

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Every bit you add doubles the resolution of a digital recorder. Compared to 16-bit formats, ADAT Type II's non-compressed, linear 20-bit recording offers a wider dynamic range, less quantization distortion at low levels, more headroom and even lower noise. Result: detailed, full-spectrum audio fidelity that far exceeds the quality of any analog recorder.



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While the rest of the world is trying to figure out the final frontier of recording formats, you need to make a decision. What's the best choice today that will keep you ahead of the game tomorrow?

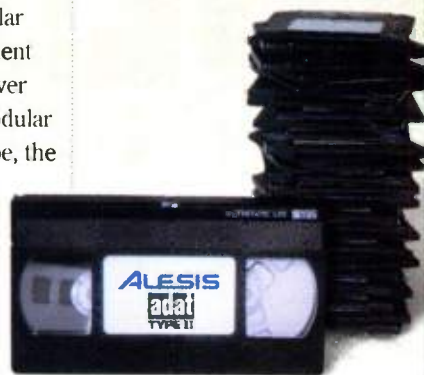
The answer: ADAT Type II. It's the next generation of Alesis' award-winning digital audio technology that combines the proven power of ADAT with the astonishing fidelity of true 20-bit linear recording.

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adat TYPE II

There are over 110,000 ADATs in use today, and the new ADAT Type II recorders are compatible with all of them. The XT20 and LX20 will work with your 16-bit ADAT tapes, and you can combine the Type II recorders in a system with any model of older ADAT.



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Advanced Digital Mixer

Panasonic is taking digital further today with the DA7 digital mixer, an entirely new standard in quality, flexibility, affordability, ease-of use and value. 24-bit converters, 32 inputs, 8 buses, 32-bit processing, moving faders, instantaneous recall of all settings, surround sound mixing...nothing this fully featured has been this easy to use or affordable... and it's available NOW! Incredible sound quality, Internal 32-bit processing and 24-bit A/D and D/A converters give this mixer sound worthy of consoles costing several times its price.

Easy-to-use. The DA7 is one powerful mixer. If you know how to run a traditional mixer, you already know how to run a DA7, since it has a smart, user-friendly design. To access any of the 32 channels, just press its select button and all parameters for the channel-EQ settings, bus and aux assignments, and dynamics and delay settings come up on the large backlit LCD screen. To access individual parameters, just touch the appropriate knob in the console's master section. This automatically calls up the sub-menu on the LCD screen and zooms in on the appropriate function. No more digging through menus or getting lost in functions; just adjust EQ, Pan/Assign, Dynamics/Delay, or Aux... and you're there.

The power to control. The EQ section offers 4 true overlapping parametric bands active on every channel (with the top and bottom bands switchable to low or high peak/shelving, or low pass, or high pass filters). Each Aux return also provides two bands of fully parametric EQ. The dynamics section offers variable attack/release times and levels for threshold and ratio on each channel, and delay is adjustable up to a maximum of 300ms. 50 Memories each are provided for EQ, Dynamics and individual channel settings. In addition to full dynamic moving fader automation of 32,000 events, there are 50 "snapshot" or "scene" memories. Plus, a Macintosh and

windows software package (that greatly expands the capabilities of the DA7), will soon be available.

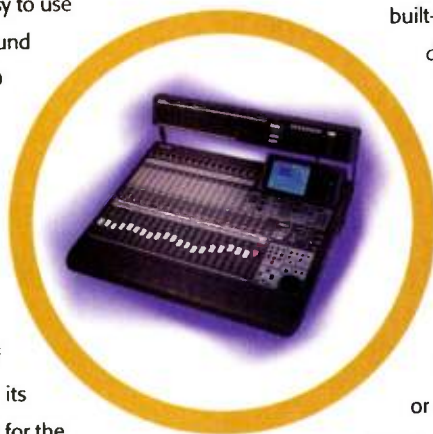
Surround sound at your command. You'll be mixing surround soon.

The DA7 is equipped to mix 5.1 channel today. The DA7 has 3 built-in panning modes, and all modes provide full dynamic control of panning, and can be copied, stored, and transferred to any other channel. An optional MIDI joystick gives you yet a fourth method of surround control.

MIDI and more. The DA7 features 4 up/down/left/right cursor keys that can be switched to output MIDI Machine Control commands to MDMs, sequencers, or workstations. Data entry is done through the large parameter dial or an alphanumeric keypad. There's also an undo/redo button, a solo-mode set, and a built-in Talkback mic.

Take on the world. The rear panel sports 16 analog mic/line inputs (8 XLR with individual software-switched phantom power, and 8 with TRS); 16 channel inserts (pre-A/D); and 6 auxiliary send/return jacks (1,2 use S/PDIF; the rest use +4dB 1/4inch connectors). Along with the 2 digital and 4 analog Aux returns, the DA7 has 38 total inputs. Digital I/O, provided via XLR connectors switchable between AES/EBU and S/PDIF, offer the master out signals and they can be assigned to inputs 15 and 16.

The DA7 rear panel also offers MIDI In and Out, word clock I/Os, both a 9-pin RS-422/485 serial port and PC port for Mac or Windows with software support for both, a 1/4 inch footswitch jack for controlling Talkback on/off or automatic punch in/out, and a D-15 subconnector for the optional meter bridge. So, take your digital mixing further today by going to the nearest Panasonic dealer and auditioning the DA7 for yourself!



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DA7 Digital Mixer

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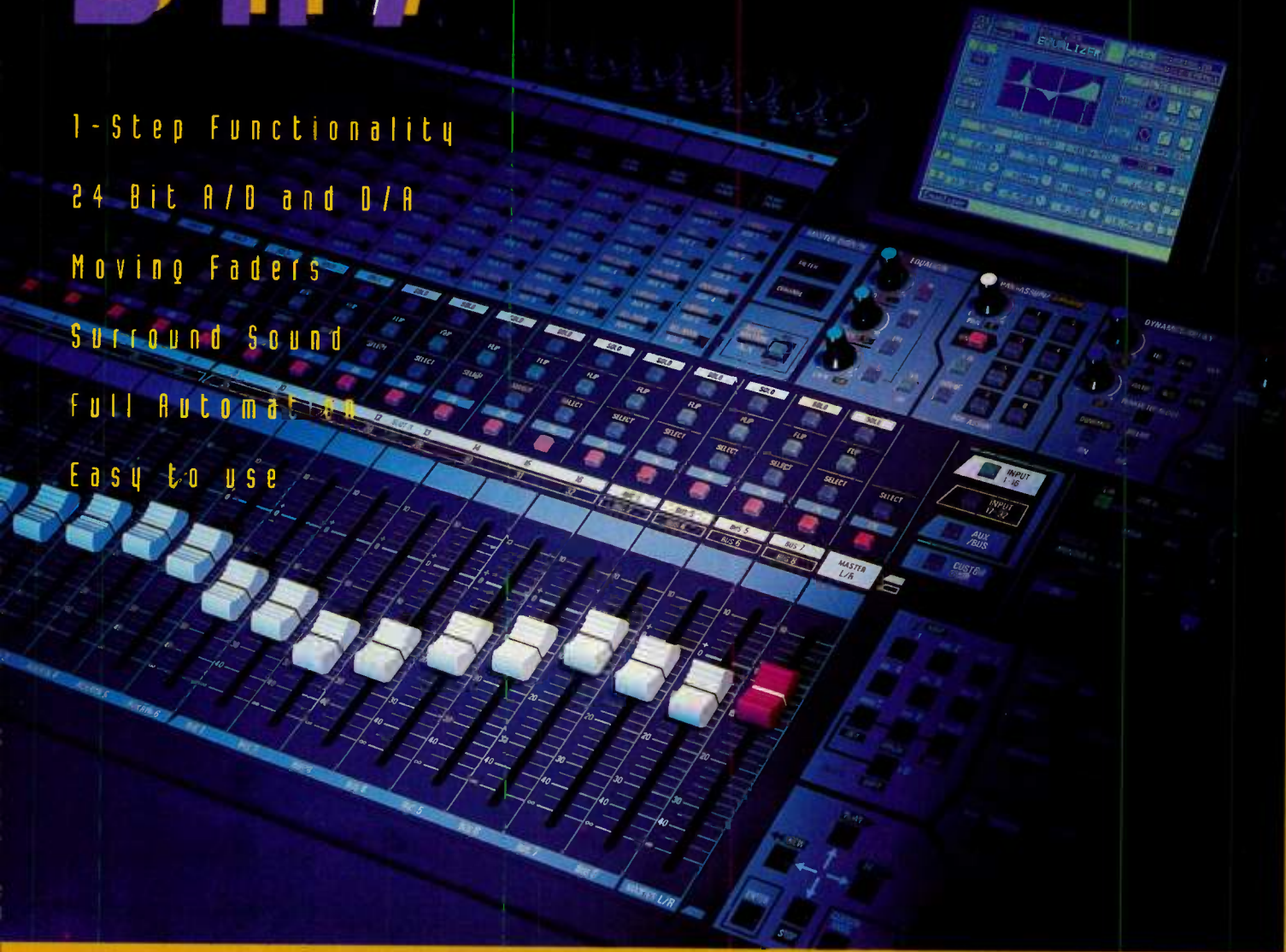
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Moving Faders

Surround Sound

Full Automation

Easy to use



Taking Digital Further

Panasonic
Broadcast & Digital Systems Company

EQ

PROFESSIONAL PROJECT
RECORDING & SOUND
VOLUME 9, ISSUE 10
OCTOBER 1998



ON THE COVER:

Brian Wilson sits in his project studio.

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- 1999 PRODUCT PREVIEW**74
It's AES Convention time again, which means a new slew of product introductions to tempt and tantalize. EQ once again does the legwork for you, bringing you the skinny on dozens of new products that are sure to bring out the Gear Slut in you. Plus, this section also features First Looks on Steinberg's Cubase VST 4.0, Shure's KSM32 studio mic, Yamaha's MSP5 powered monitor, and Otari's RADAR II.
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World Radio History

ON THE RUN

I just read Mike Sokol's microphone comments, which made a lot of good sense — especially about "listening." I'm an English sound engineer living in Austria and doing studio and live mobile recording there. I too place a great importance on hearing the instrument and nearly always record direct to tape without EQ (maybe a high-pass), preferring to run to the studio 50 times and change the mic position before I look at a filter (at least I keep fit). I like your attitude.

Keep on punching in.
Grahame Rogers
via Internet

GOOD COMPANY

I really enjoyed every one of the 11,000+ words of Ed Cherney's "Surround Session" piece in the August '98 issue. As a recording engineer working in the trenches to capture worthwhile musical performances, it is reassuring to know that the likes of Parsons, Cherney, Schmitt, and Scheiner are really thinking about and discussing how they can mix and present these performances in the best surround sound. You guys can mix my stuff anytime!

Barry Rudolph
via Internet

TAKING REQUESTS

I received my September issue of *EQ* today, and was excited when I saw the article titled, "So You Want To Do Sound For Films" in the contents. As a composer who would like to get into some of this work, it looked like just what I've been waiting for. Imagine my disappointment then, when it turned out to be mostly about how to write music to accompany film, with a few light references to the equipment involved. I can handle the writing part. That's my responsibility, and I don't think any article could give me the talent to do that if I didn't already have it. So, what do I want? Glad you asked. I'd actually like to see two articles:

1. How to go about finding jobs in this area. I know that film and TV, like all areas of entertainment, are highly "cliquish" and "closed," and the trick answer is that you find a job by having a job find you; but there must be some avenues an "outsider" can pursue to get to the right people for this. Are there

trade magazines where film or TV producers advertise for music or composers? Or something similar? Somewhere to start?

2. Equipment needed to do film and TV work. This could address several levels, from a basic, no-frills, "starter" setup, to more advanced and costly systems. What software is good for this work on the PC or Mac? Do I need sync boxes? What kind? What kind of features should I look for in a sync box, or VCR, or software, with the goal of doing this kind of work in mind?

I really like your magazine, and I don't mean to gripe, but between your magazine and a few others I subscribe to, I've seen my share of articles on this subject where the article is just tips on composing, often as hollow as "write something that enhances the visual experience"... duh. I'm writing to you, because I consider *EQ* the most content rich and relevant magazine I read, and you seem pretty responsive.

How about something that attacks the technical aspects of sound for picture like file formats, setups, etc., as well as an informational article on getting ourselves into a position to use that stuff?

Sean Kerns
Cincinnati, OH

[Thanks for the letter Sean. Keep an eye on out for our Project Post Quarterly sections, which will be covering many of the topics you requested. —Ed.]

FAIR PLAY

I'd like to say that I really enjoy reading your magazine and that it has helped me greatly in my recording efforts. The reason that I'm writing is that I've noticed that, out of several music magazines that I read (one of which I subscribe to), yours is the only magazine that features what I consider a fair representation of the recording industry. Being African



PHOTO BY EDWARD COLYER

American, it's good to see artists and project recordists in a magazine that I can sometimes relate to, not because of color, but because of the type of music that certain artists create. I'm glad to see that *EQ* writes about the artist or recording engineer, etc., based upon what they do as opposed to what they are.

There have been a few African American artists you featured that I didn't like, but still learned some things by reading their articles. This is America, and I feel your magazine is continually showing a fair representation of our country, not just for African Americans, but for all Americans. I will be changing my subscription to *EQ*.

Joseph McNeil
via Internet

WRITE TO US

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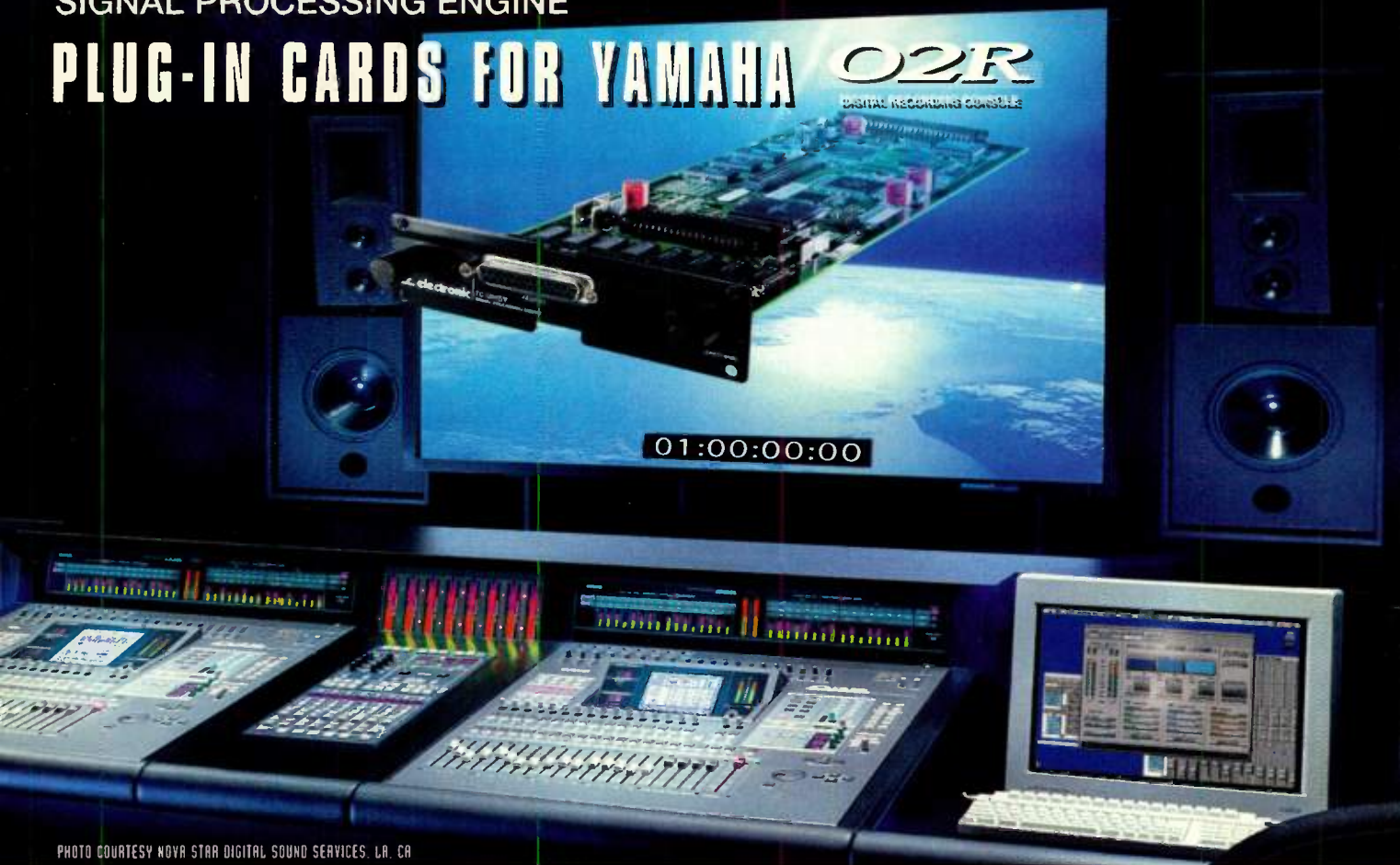


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CIRCLE 98 ON FREE INFO CARD

PROCESSING TRANSFERS

Q Could you discuss how to best work equalization and compression when converting/transferring analog to digital and then remixing to DAT?

Rob Waldrop
via Internet

A Well, there's a whole lot to think about when transferring analog to digital, but the basics are as follows:

Don't give up the bits. 16-bit digital is fine for most applications, but don't throw away those precious bits by transferring to digital at too low of a level. For instance, I get DAT tapes in all the time where the peaks never get past -12 dB. Remember that each 6 dB of signal level represents one of your 16 bits, so, in that instance, you're only recording at 14 bits of resolution. If you then bump it up to 0 dB in the computer (via normalizing or some other process), you'll introduce extra noise and distortion.

I normally run the tape through the converters twice. The first time the signal is low enough so that my peak capture meter tells me the maximum level the tape reached. Then if it's only hitting at -10 dB, I'll raise the gain by 8 or 9 decibels and try again. In a perfect transfer, the absolute maximum level would just kiss 0 dB on the A/D converters. If you have only a few places on the tape where the levels get wild and peaks the digital meters, I suggest patching in a limiter and adjusting the gain to bring most of the program up to a reasonable level. Set the limiter to only hit on the really hot parts, which will protect you from digital splatter.

Don't add incoming equalization. Everyone who's ever recorded to analog tape has done it. You know that you're going to lose some high-frequency response from the tape, so you boost the 10 kHz band any time you go to another tape track. That way

you'll be back to normal by the time you get through the worn tape heads. But that isn't necessary when recording to digital. If you need a little touch-up equalization during the initial transfer from analog to digital, that's OK, but don't overdo it. Too much of it will make for a very shrill-sounding end product as well as messing with the phase accuracy of the program. At the moment of A/D capture, you've defined how good the sound will ever be, so don't mess with anything you don't have to at this point. Do any overall equalization on the way out, as it were. You may want to patch in a good parametric equalizer for the transfer back to DAT. That way you can play with the equalization without messing with the rest of the data files. I'll usually leave the equalization fairly flat for a DAT transfer that will end up as a CD, but do some moderate high-frequency boosting and overall compression on the copy that's going to cassette tape.

Mike Sokol
Contributing Editor
EQ magazine
jmsokol@intrepid.net
www.soundav.com

IN A PINCH

Q We have a couple of Panasonic SV-4100 DATs here at the radio station, one of which has been in for repair for about six months. Don't get me started on the repair guy we have to use in this town...

The problem seems to be that the 4100 needs a new pinch roller. Panasonic Canada has been no help, and apparently Panasonic Japan is no longer supporting this machine with parts, as nobody has been able to find a new one. Does this mean that we are looking at the same tech support problems with our other Panasonic DATs? We use two 4100's, two SV-3700's, and one SV-3800 spread among three radio stations.

As these machines are starting to break down on a more frequent basis, we've just got a Sony PCM-R500, and hope to get another one to replace the 3700's. It appears to be a good choice to do that job, but what can we use to replace the 4100's? I need the Instant Start feature of the 4100, as management here is way behind in getting digital editors.

Craig Jackman
Production Director
CHEZ-FM, Inc.
Ottawa, Ontario, Canada

A I do not believe there should be any difficulty getting parts for any of the machines you mentioned. I think the problem might be that the pinch roller is sometimes detailed as part of an assembly. The parts numbers are as follows:

Pinch Roller:
1NB0001Za, \$21.60
U.S.

Pinch Assembly:
RXL0046, \$28.35 U.S.
You can reach Panasonic via their Web site: www.pasc.panasonic.com/

Also try: Union Electronics, 708-946-9500/800-648-6657; Web: www.unionel.com/.

Eddie Ciletti
Contributing Editor
EQ magazine

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IF YOU BUILD IT...

Q

I'm interested in constructing the Altec tube mic preamp you described in EQ. I was thinking of making two and placing them in one housing. Will I need to build two entirely separate circuits, or can a transformer be shared?

Dave Adams
via Internet

A

I have recently updated my Altec mic preamp Web page with links (see Web address below). The original transformer specified from the Antique Supply Catalog (P-T442) will only drive one circuit. At \$12 each, two of them are more affordable than the next, more powerful option, P-T261M6 (\$58).

Visit www.tangible-technology.com/tubes/altec.html and link to the suppliers. Parts availability changes from time to time, and a more affordable option may materialize.

Eddie Ciletti
Manhattan Sound Technicians
NYC, NY

MOIST MIC

Q

I've had an Audio-Technica 4033 for about a year and a half. One day I turned on the power (and phantom power) of my Mackie 1604 at the same time. Now the mic seems to have lost all of its high end and what comes out is somewhat muffled. Did I damage it? If so, where can I get it fixed? I've checked everything, from the cable to other mics, and it's definitely the 4033.

Carlo
via Internet

A

Any chance you live in a very high-humidity environment? Most mics are shipped with a silica gel pack to absorb moisture during shipping. The real physical warmth of tube condenser mics helped make them less susceptible to humidity. It's an especially good idea to keep your condenser mics covered (if not in their original packing) when not in use. (Silica packs can be re-activated by placing them a foot in front of a hair dryer set to LOW.) All condenser mics should be "warmed up" before use to allow them enough time to stabilize with the environment. Always

use a pop filter when recording vocals.

All microphone service should be referred to the manufacturer first. They may refer you to an authorized service center or require that it be shipped back to their main service facility.

Eddie Ciletti
Manhattan Sound Technicians, NYC
edaudio@interport.net

FEELING BURNED

Q

I have a CDR800 and have been burning a lot of CDs. I find that quite a few CD-Rs will not play in some players. Is this a fault of the machine or the blank discs? Some folks say it makes a difference in the color of dye. What brand CD-R would you say is the best in quality if you feel this is indeed my problem?

Wes Homner
via Internet

A

You've ruled out everything but the players! Recordable discs are like analog tapes — there are at least three types, but all are supposed to be compatible. CD recorders don't "read-after-write" like a tape machine; we can't tell which disc works best for each machine. It sure would be nice to know the absolute integrity of the discs. I've been pushing recorder manufacturers for an Error Rate/quality-of-disc display and hope that some company will eventually release affordable diagnostic software for after-the-fact evaluation.

If you have a client having trouble playing a disc, have all three types on hand, try 'em, see for yourself, and let me know the results! But don't rule out the players. They have their own tolerances, not only for the information reflected from the disc, but also disc height (focus range) and the ability to accommodate warped, dished, and off-center discs. The same does apply to the recorder.

Eddie Ciletti
Contributing Editor
EQ Magazine

ASK US

Send your questions to:
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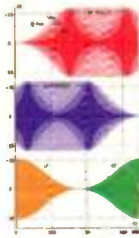
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World Radio History

EQ Section

Once again, Allen & Heath has succeeded in bringing you our legendary British EQ. The brilliant 4 band EQ, with 2 fully parametric mid sections, with selectable Q mids, is absolutely precise, giving a sweet breathy top end and a solid controllable low end. For even more flexibility, the mid EQ sections can be inserted either in the recording channel path or the mix monitor path, as can the high/low frequency EQ sections.

HF ± 15dB	12kHz	Shelving
HMF ± 17dB	300Hz to 15kHz	Peak/Dip
LMF ± 17dB	18Hz to 1kHz	Peak/Dip
LF ± 15dB	60Hz	Shelving



Solo-In-Place

The GS3000 includes solo-in-place abilities for use during setup and recording. Their two-handed operation ensures that they are not called up by mistake. Set the balances between the sources and effects, exactly as they will sound in the mixes, by muting all channels except the one you are working on: hold down the *solo in place* button and press the channel *mute* button to hear its output alone. Release both and all mute settings will be returned to those you had before. You can recall the last solo patch by holding down the *shift* button while pressing the *solo in place* button. Use the *channel safe* button when you're recording to prevent solo affecting the multi-track feeds. Monitor and channel solos are independent unless the *solo link* button is pressed. Use this switch for mixdown or live applications if additional instruments are being fed to B mix. Like the mutes, solos can be made individually safe.

4 Mute Groups - 128 Snapshots

Four sets of mutes can be stored and quickly recalled using the *mute group* buttons on the master section. When you have the console set up for a take which will need to be recalled later, press *store*, then a *mute group* of your choice. Up to 128 scenes or mute patches can be set and stored in the snapshot memory. Any mute scene set on the console can be stored simply at any patch number and then recalled as needed. You can hand over the mute settings to MIDI control easily by selecting the required channel and pressing the *MIDI* button.



MIDI and MMC

The GS3000 provides IN, THRU and OUT connections for MIDI control of patches and mutes, and for the MIDI Machine Control buttons placed conveniently at the bottom of the master section. Dedicated buttons are provided for Play, Record Stop, >>, and << with fully LEDs. Mark and locate functions are provided and the tracking option allows you to hardwire other remotes. In conjunction with the display panel and associated LEDs, MIDI programs can be loaded (the console responds automatically to Sys-Ex dump), disabled or dumped. Error messages help trace program problems, soft and hard resets are available, and a power up/down memory protects against data loss.



We've Got A Bright Idea

VACUUM TUBE PREAMPS IN A CONSOLE

Over the years, the Allen & Heath name has become synonymous with silky-smooth sound and powerful economy in every console, whether it's a small format project studio/SR board, or a full blown FOH and/or monitor desk. Now, the new GS3000 recording console gives you two patchable vacuum tube preamps, allowing you to add touches of unmistakable tube warmth to your mixes. Some idea, huh? And we didn't sacrifice any of the features our customers have come to expect from us either: a smooth and versatile British 4-band (fully parametric mid) EQ, twin fader in-line format, 8 sub groups plus stereo master, and full Mute group automation (with 128 scenes) as well as MIDI

and MMC control. The in-line design of the GS3000 ensures that you get top-notch performance from each console element. And the two vacuum tube preamps give you unprecedented creativity in shaping your sound right inside the console, where phase integrity and superior noise specs remain intact. So get down to your pro audio dealer today and hear our bright idea for yourself.



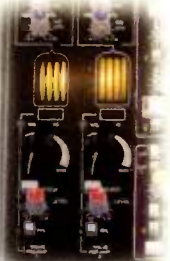
8760 S. Sandy Parkway

Sandy, Utah 84070

ph: 801-568-7660 fax: 801-568-7662

www.Allen-Heath.com





4 Stereo Inputs

Two dual stereo channels are mounted on the right side of the master section - 4 stereo inputs in all. All stereos have automated mute, linear faders, stereo PFL and routing via balance controls on both mixes. The lower stereos with their 100mm faders are ideal for electronic instruments and MIDI-sequenced sources. They have *gain* pots, 4-band EQ and, like the mono channels, routing to all auxes. The upper stereos are built for FX returns: they include input matching for hi or lo levels and routing to auxes 1 and 2 for monitor mixes. Innovative switching in the master section enables extensive use of auxes and stereos for effects in cues and the final mix.

Mic/Line Inputs

The GS3000 uses a new microphone preamp which has been specifically designed to give a wide gain range, high linearity and extremely low noise. Noise performance at mid gain is as much as 12dB quieter than other designs.

Peak and Status LEDs

Each strip has a red *peak* warning LED which monitors the signal at the mic/line preamp, after the EQ, and after both faders. The LED illuminates if signal level is within 6dB of clipping at any of these points. Linked to the MMC control, the *status* warning LED shows record-ready and channel-safe conditions.

Routing

Post-EQ, the channel path is fed via PFL, mute and fader to the *grp/dir* switch: send either the direct channel output or the appropriate to the *tape out* jack. *Pan* and *on* switches also take the channel path's output to the stereo *B channel mix* for extra monitors and feeds; and to the *source* switch at the foot of the channel. Select *channel* as the source to submit to tracks during multitracking and bouncing, or for more effects during mixdown. For extra inputs at mixdown, like from MIDI instruments, channel-path inputs can be sent to the main monitor mix by pressing *B TO L-R* on the master section.

Dual Paths — Dual Faders

The recording path and the monitor path are on the same strip, maximizing space and increasing the number of inputs at mixdown. Recording level is set on the 60mm fader, while the 100mm fader is used to monitor the tape return. Then when you're ready for mixing, the levels are already set on the long faders. Both parts of the path have access to the eight groups and 6 auxes, as well as the stereo "B" mix and the main L-R "monitor" mix.

6 Aux Sends plus XFX

Feeds to any four of the 6 auxes can be chosen in pairs from either the mic/line channel path or the tape return monitor path. Auxes 1 and 2 can be set pre- or post-fade by global switches in the master section: pre-fade for the musicians' cues from the channel path, post-fade for dedicated effects from the channel path to tape, or for extra effects from the monitor path on mixdown. Auxes 3 to 6 are post-fade FX sends, with 5 and 6 included in the mute automation system for programmed control of effects.

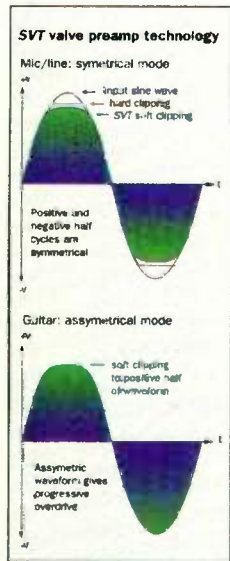
When mixing down, a separate post-fade stereo effects send can be created by pressing the XFX button: this sources the channel fader from the long monitor fader. The channel fader then becomes the stereo level send (which can mute automated) with its output available on the studio feed output jacks.

XFX outputs

When mixing down, mix B can be fed post-fade from the XFX switches on the channel strips for use as extra stereo effects sends.

BUILT-IN SVT VALVE PREAMPS

Allen & Heath has introduced its SVT (symmetrical valve technology) in the GS3000. Two double-triode ECC83 valve amplifiers can be patched to add warmth and color to inputs or mixes. Based on resurgent high-fidelity vacuum tubes, SVT can be configured in symmetrical mode for regular mic/line or mix sources, or single-end cascaded "guitar" mode to give the type of pleasing harmonic distortion much sought after by guitarists.



In mic/line mode, the double triode valve is balanced, each triode amplifying one half cycle. Maximizing the characteristics of the valve, this low noise configuration compresses and then soft clips both halves of the cycle equally, ensuring that only low-order harmonics are produced when the valve is overdriven.

In *guitar* input mode, the valve is not balanced, so the positive half cycle will distort differently from the negative when overdriven. This produces the rich second-harmonic distortion, so often absent from solid state guitar amps.

Inputs are taken via gain controls from balanced XLR and TRS jacks for the mic or line sources. For *guitar* mode a high impedance input is provided, with a pre-valve swept frequency EQ.

The *valve drive* control sets the coloration created by the valve and a switchable *high cut* filter removes HF and enhances warmth. Output is sent to the rear-panel jack.

You may patch the tube to a channel insert for full EQ and routing, or to a group to record direct to tape; or patch it to the master mix (L and R inserts) to add warmth to the whole mixdown.

8 Subgroups

The 8 group busses can be used either in mono or as stereo pairs. If the input is panned fully left or right the signal will go to one group. The 8 group buss outputs are sent, post-fader, for recording to the related *grp/dir* tape out switches on the L/O strips. Each group has an insert point before its 100mm blue fader. Patch in group effects here, or sources you want to lay direct to tape with the shortest path; like the tube preamps. The faders are arranged in stereo pairs to feed subgroups to the main mix, via their individual L-R switches. The *stereo* switches can be a great help at mixdown: select stereo to feed a pair of subgroups to the L-R mix. Without *stereo* selected, each mono subgroup is centrally placed in the mix. You can monitor the submix in stereo by pushing both *APL* switches together.

A Studio With Pull

This Long Island-based studio is busy with remixes and its owner's personal projects

STUDIO NAME: Unnamed. Owner Pull says, "If you are in a studio as much as I am, the studio becomes your home. I wouldn't name my home, so I never really named the studio."

LOCATION: Valley Stream, NY

MAIN PEOPLE: Owner Pull says, "It's my place, I do everything in it. Shane Valentine is my studio assistant. With his little feet, he gets around the room really fast!"

CREDITS: Pull has done remixes for artists including Aahliyah, Sugar Ray, Angelica, Jody Watley, Bare Naked Ladies, Dimitri From Paris, All 4 One, and So Pure. His recent production clients include Flu Thirteen and Plastic Playground. Pull notes, "For the past three years I've mainly been producing my own band, kHz. There's been an EP, a full-length, several singles, a video, and a few 12-inch remixes."

CONSOLE: Soundcraft 48/8 Spirit Series

TAPE MACHINES: TASCAM TSR8 (analog 8-track) and 112 cassette deck

DAT MACHINES: Panasonic SV3700

MONITORS AND POWER AMPS: Yamaha NS10M; JBL Cabaret 4628b ("for that big-ass BOOM"); Hafler Pro 2400 power amplifier

MICROPHONES: Audio-Tech-

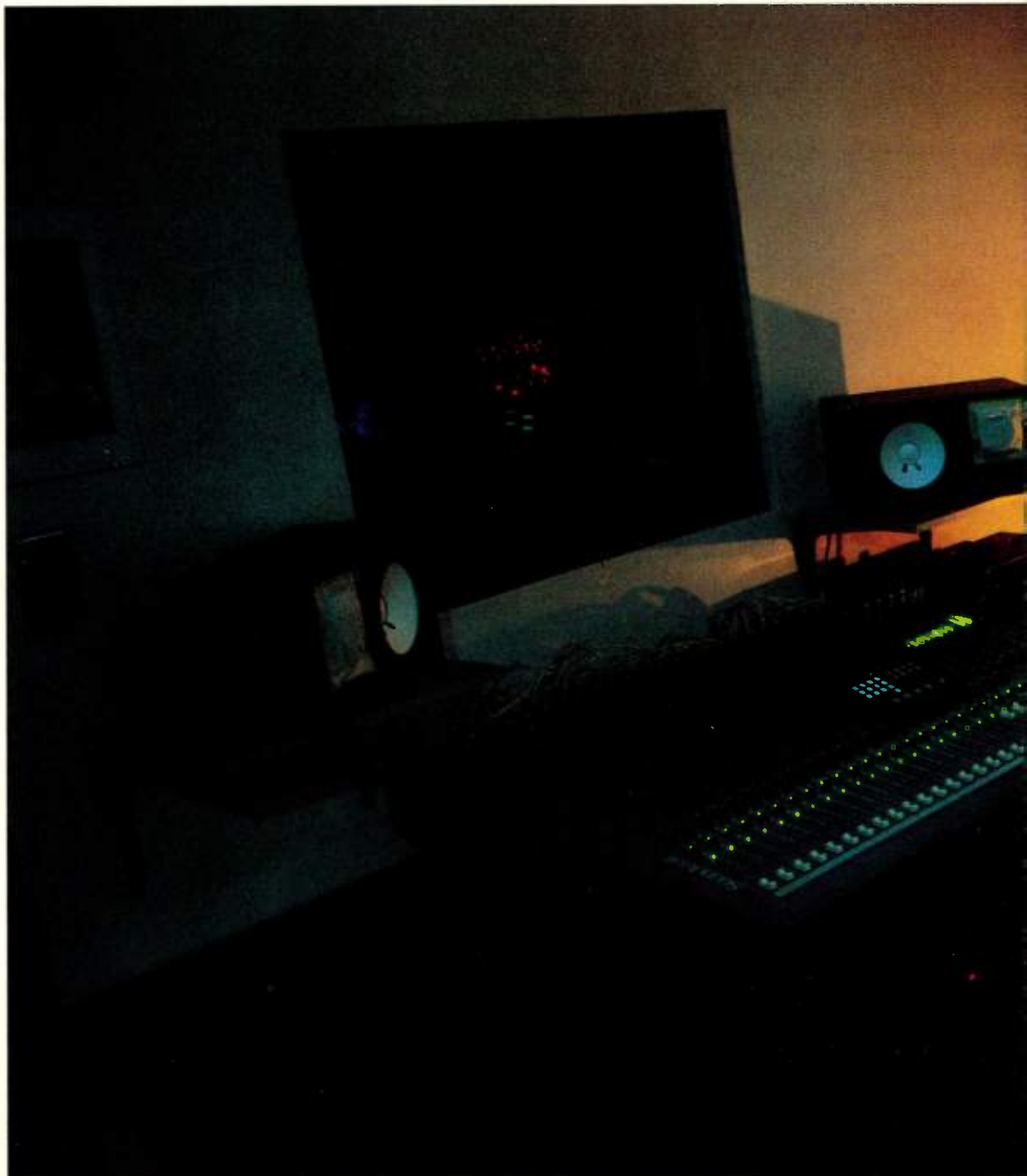
nica ATM31; AKG 414; Shure SM58

OUTBOARD GEAR: Alesis Quadverb [2], Midiverb II, 3630 stereo compressors [2], and Wedge; Lexicon Alex [3]; Roland SE-50; Effectron II delay; ART SGX Nightbass and Tube MP mic pre; Crybaby wah-wah; dbx 163x compressor and 263x de-esser; Behringer Composer Pro compressors [2]; Audio Logic MT44 quad noise gate

KEYBOARDS: Yamaha DX-7II FD; Roland

Juno 106 and XP-10; Casio CZ-101

MIDI GEAR: Korg M3r and Trinity Tr Rack; Kawai K4r, K1r, and K1r II; Roland Super JX and MKS 70; E-mu Proformance/1 piano module and Proteus II; Oberheim Matrix 1000; Nord Lead Rack; Novation Drumstation; Alesis D-4; Akai S 612 Sampler w/drive and S900 samplers [2]; Linn 9000 w/sampling and SMPTE; JL-Cooper PPS 100; electronic drum kit that



includes DrumKat, Daux pads, and a Gibraltar rack

COMPUTERS AND SOFTWARE: Custom-built IBM-compatible with 2.5 GB hard drive, 128 MB of RAM, and 266 Intel PII processor; Event Gina sound card; Iomega Zip drive; Steinberg Cubase Audio VST, Cubase Audio XT, WaveLab, and Rebirth; Sonic Foundry Sound Forge and Acid; Syntrillium Cool Edit Pro; Cakewalk Audio 7.0; Logic Audio Platinum. Pull also uses a "bunch of plug-ins for each program — too many to list."

EQUIPMENT NOTES: Pull says his most valuable piece of equipment is "my ears, but I know I can always count on my S900's (samplers).

I really manipulate the sh— out of sounds with them."

STUDIO NOTES: Pull states: I firmly believe that it's the person behind the equipment. Technology is only as good as the idea you're trying to portray with it. I've often been ridiculed for a lot of the equipment I've used, but when I finish a project, everyone says, 'Where'd you get that sound from?' And I say, 'The same equipment you were laughing at a minute ago!' I think what the studio is best known for is the vibe the room has. It's all about the music and the vibe it creates. If it's in my head, it's a part of me, and the room must then become a part of me as

well, so then the gear, the music, and the room become one, and the magic starts. Pretty trippy, I know, but screw it — it's the truth!

PRODUCTION NOTES: Pull continues: I don't have much of a formula. If I'm doing a remix, I'm in whatever direction the song is taking me. If it's my own stuff, I usually don't know where the sounds come from — I realize it more when it's done. To me, mixing really plays a big part in the final sound, and I have a lot of tricks I do in the mix to get the sounds I want. I often produce and record with the way I'm going to mix already in my head and dictating the pace. **EQ**

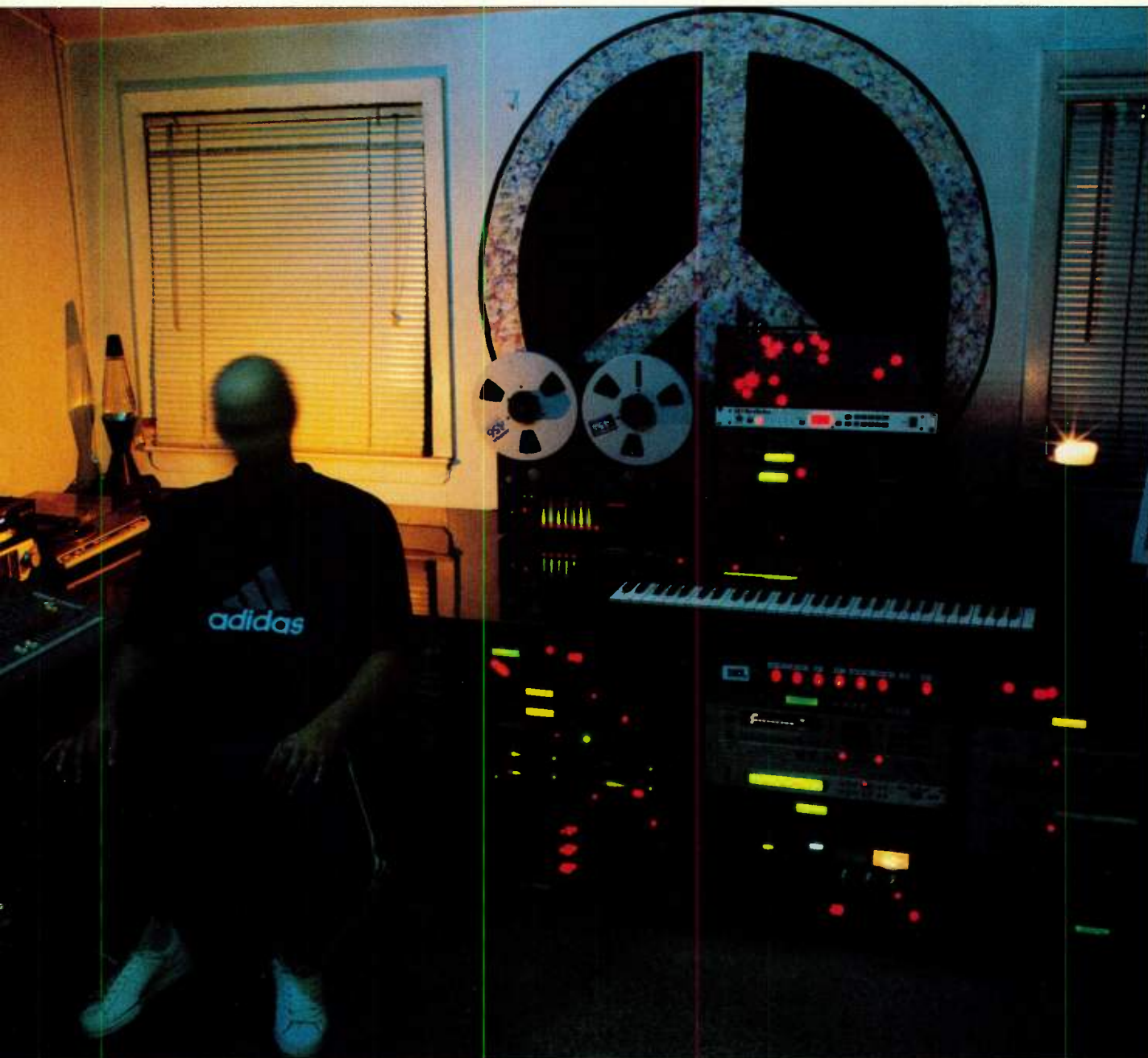


PHOTO BY WESS BENDER

TOTAL CONTROL. TOTAL CREATIVITY.

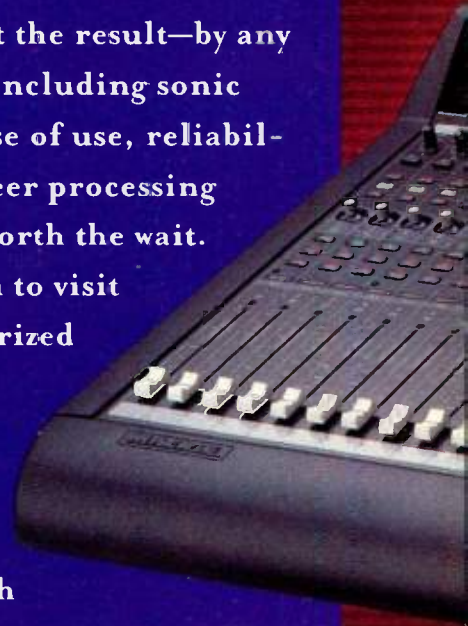
MORE CAPABILITY 72 channels, 56 inputs • **MORE SENDS** 8 mono and 2 stereo aux sends per channel • **MORE PROCESSING** 48 channels of digital parametric EQ, compression, and gating, plus reverb, delay, and chorus • **MORE AUTOMATION** More dynamic and snapshot-automation parameters than any comparably-priced digital console • **MORE INTUITIVE** One-touch commands and an analog look and feel make the D8B easy to use • **MORE CONNECTIVITY** Ethernet port and connections for optional mouse, keyboard, and monitor • **MORE STORAGE** Internal hard disk for saving scads of automation files for instant session recall • **MORE OPTIONS** Open architecture for adding more I/O, "famous name" effects, and software upgrades • **MORE CONTROL** The Mackie Real Time OS™ automates nearly every D8B function and all are accessible from the console and optional monitor • **MORE CREATIVITY** Put all of these features together and you've got the Digital 8•Bus—a creativity powerhouse

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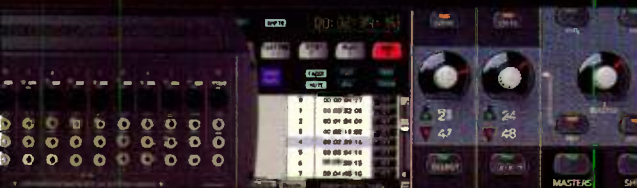

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Manley Reference Gold Multipattern

Two new mics
that sport a
classic look

MICROPHONE NAME: Manley Reference Gold Multipattern and Reference Cardioid

TYPE OF MIC: Vacuum tube condenser

POLAR PATTERN: Omnidirectional, cardioid, and figure-eight (see notes)

SENSITIVITY: 17 millivolts/Pa

MAXIMUM INPUT SPL: 150 dB

SIGNAL-TO-NOISE RATIO: -113 dB

EQUIVALENT INPUT NOISE: -120 dB

OUTPUT IMPEDANCE: 200 ohms

CURRENT MSRP: Reference Gold Multipattern: \$5500; Reference Cardioid: \$3000 (both prices include case, cable, power supply, swivel, and shock mount).

DIMENSIONS: 2 1/16 (diameter) x 4 5/8 (length) inches

WEIGHT: 3 pounds including cable

MIC NOTES: Manley Laboratories has been manufacturing microphones in California since 1990. Shown in this photo are the Reference Gold Multipattern and the Reference Cardioid microphones. Both microphones employ a 1.25-inch capsule with a 1-inch diaphragm. The Reference Gold Multipattern has continuously variable directional characteristics and a 3-micron gold-sputtered diaphragm made in California. The Reference Cardioid is a fixed-pattern mic with a 6-micron gold-sputtered over mylar diaphragm. The thicker diaphragm used in the Reference Cardioid is intended to provide a sound reminiscent of vintage European tube mics. The 24-karat-plated Reference Gold is also available in a stereo version that houses one fixed and one rotating capsule. The Reference Gold and Reference Cardioid mics share the same all-tube electronics based on the JAN (Joint Army-Navy) 6072A. Manley hand-selects each tube for low noise and microphonics, and the output transformers are designed and built at the Manley factory.


CONTACT: Call Manley Laboratories, Inc. at 909-627-4256 or visit their Web site: www.manleylabs.com. 



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On the road with Davey Johnstone and John Jorgenson, the red lights always mean go.



Sometimes it's hard to tell where the road ends and a song begins. That's why Davey and John are recording every chance they get during their world tour with Elton John. Their new acoustic release is going from the Sony MDM-X4MKII MiniDisc multitrack direct to CD. "The editing features make the possibilities endless," says John, "but the sound quality was really the determining factor for this project." Hear what the Sony MiniDisc multitrack recorder can do and you'll be running some red lights, too. And to find out more about their new CD, Groovemasters Vol. 2, visit www.acousticmusicresource.com.

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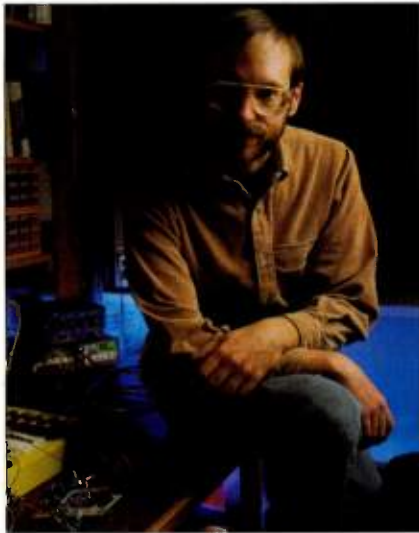


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World's Greatest Studio Disasters

No, not Fox's new show,
but what to do when
misfortune strikes your
project studio

BY CRAIG ANDERTON



You're just about ready to record your next track when the whole house starts shaking. Your tape recorder jumps up six inches into the air, guitar cases fall over, and a keyboard falls off its keyboard stand. The electricity goes out and the phone is dead. Welcome to the earthquake zone.

Or maybe you've been given two hours to evacuate in the face of an oncoming forest fire. You hope the firebreak between your house and the fire will hold, but you never know...

Or what about that hurricane that's developing in the Atlantic or the Gulf Coast — 140 mph winds can really wreck your day, not to mention your studio.

The point is, between fire, flood, hurricanes, tornadoes, and other natural disasters (let's not even talk about asteroid hits, okay?), your business is always in peril. There's no safe place, and you need to be prepared if you don't want to start your life again all over from scratch. Having had a studio two miles from the

epicenter of a 6.2 earthquake, 200 yards from where a 20,000-acre forest stopped, and in the path of several hurricanes, I realized that if I didn't want to see everything I'd worked for disappear in a matter of hours, an ounce of prevention was in order. You aren't immune from natural disasters either, so take the time to get your affairs in order now, before the unthinkable occurs.

YOU ARE INSURED, RIGHT?

It's not fun to think about insurance, but it's necessary. Policies vary widely; for example, policies may pay the actual value of damaged gear, as opposed to the (typically higher) replacement cost. There may also be issues if you use your gear in a home business, as it may not be covered under your homeowner's policy. You may need a rider on your existing policy, or a different policy to cover your gear. Similar problems can arise for gear that leaves your home; for example, that you take to a gig.

Schedule a meeting with your insurance agent *right now* to find out the exact parameters of your coverage. Also, remember that once you lose your insurance, it's hard to regain. If you're happy with your policy and insurance company, consider absorbing the costs of minor claims yourself to avoid having your policy "flagged." Also check with any professional organizations to which you might belong (ASCAP, NARAS, Musician's Union, etc.), as they may offer competitive insurance programs on instruments. Make sure you're adequately covered; paying the extra premium is a lot less expensive than rebuilding your business.

Further, note that standard homeowner's policies don't cover flood damage. This requires buying a separate policy from the federal National Flood

Insurance program, and owning such insurance is probably mandatory to obtain a mortgage anyway if you purchase a house in a designated flood zone.

KEEPING RECORDS

After squaring away your insurance, inventory all your gear. The key to settling a claim to your satisfaction is to have meticulous, comprehensive documentation. One good method is to take a camcorder and shoot all your gear; as you shoot, narrate the price you paid for each item, where and when you bought it, make and model, and the serial number. Don't forget what's in drawers, closets, and in storage. You might also play back the tape and transcribe your

notes on paper, just to have a backup; entering the information into a database isn't a bad idea either. A still camera works well too, if you accompany the photos with notes (digital cameras are very slick for this application, as you can simply update the disk as you acquire or sell gear). Don't forget to update this data as needed.

Also keep all receipts for your gear in one place. You've probably had to do this anyway for tax reasons, but if you kept your receipts along with the tax records for a particular year, separate out all the receipts so they're together.

Now that you've collected this data, you need a place to store it. A safe

deposit box is an excellent, inexpensive investment. Keep the originals of your camcorder tape (or photos) and your original receipts in the box, and maintain copies in your home, preferably in a fire-proof safe. Also keep a list at home of what's stored in the safe deposit box.

PRESERVING YOUR DATA

Losing gear is tough enough to deal with, but at least it can be replaced. The MIDI files, hard disk audio files, tape

*Between fire,
flood, hurricanes,
tornadoes, and
other natural
disasters, your
business is always
in peril.*

The World's First

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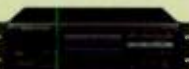
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The Dual DAT Master
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DA-P1
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With digital and analog I/O, word clock, and a menu driven environment, TASCAM's 24-bit DA-45HR DAT recorder is brilliantly designed to master from DAWs and other digital recording systems. Plus, its Standard mode provides complete backward compatibility with 16-bit DAT machines.

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TASCAM

Take advantage of our experience.

World Radio History

CIRCLE 75 ON FREE INFO CARD

collections, and other media containing your work are irreplaceable.

You should already be practicing good backup procedures — making copies of your important work, and keeping them in a safe deposit box. However, I also recommend having a “backup buddy” who lives in a different state and can hold on to copies of critical files for you (and, of course, you provide the same service for your buddy).

But what if you’ve been really lax about copying files, and there’s a disaster heading your way? The quick so-

lution is to take the case off your computer, disconnect the wires going to your hard drives, and pack the drives in a well-padded case you can take with you. (This is also a good idea if you have to ship a computer via the airlines; take out the hard drives, and carry them with you as carry-on items). If you still have phone service at the time of evacuation, you can also e-mail critical files to yourself, and hopefully be able to download them when the crisis has passed.

...AND DON'T FORGET THE MINOR DISASTERS

Not all disasters are as dramatic as something like an earthquake. A nearby lightning strike can get into your phone lines and take out your motherboard thanks to its serial-port connection to the modem (my local computer store says that the primary cause of electrically related computer deaths has to do with transients coming in on the phone lines, not AC line surges). Adding surge protection to your phone lines and AC outlets is cheap insurance, but bear in mind that quality varies widely — a \$10 barrier strip with a “surge protector” will not offer the same level of security as a pro-oriented product from companies such as Panamax or TrippLite. Many uninterruptible power supplies (which can save your computers stress under any circumstances) also include surge protection, and offer insurance should connected equipment become damaged. You need to register your gear with the manufacturer, but make sure you take the time to do so.

Every studio should have a fire extinguisher capable of dealing with electrical fires. And to make sure that fire doesn't break out in the first place, have a good electrician go through your wiring. Check that the wiring is adequate to handle the amount of gear in your rig, and also, that all grounding is properly implemented.

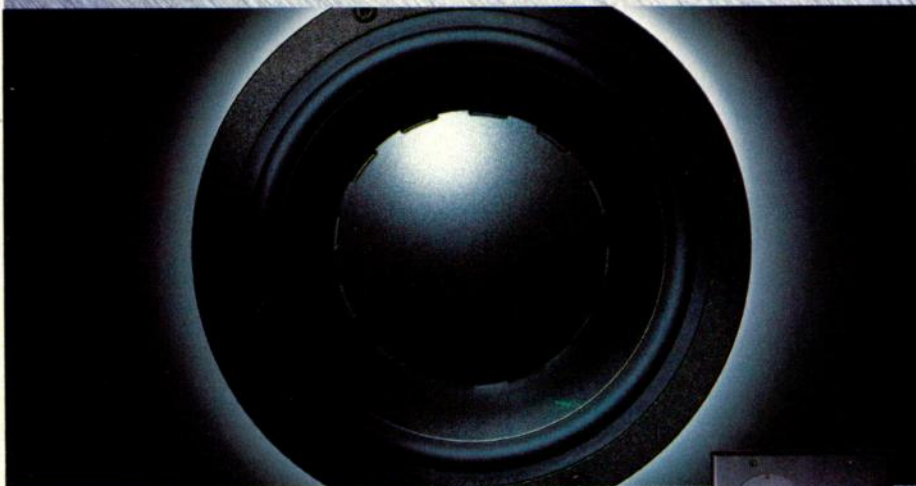
While you're waiting to schedule an appointment with the electrician, turn on your gear and feel the wall outlets and extension cords feeding your gear. If they're warm or hot, better make that appointment a priority.

Finally, if you're building a studio on to an existing structure, consider having your contractor turn the studio into a “safe room” — extra strong beams, reinforced glass, storm shutters for windows, and the like. If all else fails, you can herd yourself and your family or friends into the studio until the storm blows over. Best of all, you can break out the acoustic guitars if you need to pass the time.

I sincerely hope that no disaster ever strikes you (or me, for that matter). But if it does, you'll feel a whole lot better to know you were prepared.

EQ Technology Editor Craig Anderton is the author of Home Recording for Musicians and Multieffects for Musicians, as well as a popular lecturer on the subject of musical electronics.

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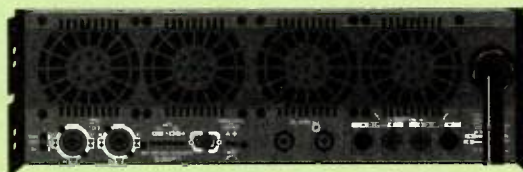
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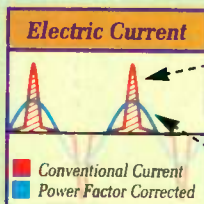
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Was (Not Was)



PHOTO BY ED FREEMAN

The Was Brothers ride again

BY MR. BONZAI

Is this the official reunion of Was (Not Was)?

Don: This is it. I should have carried David across the threshold.

David: How about a bag of bagels?

The curtain rises on Act II — what can the audience expect?

Don: I have started looking at music in this way: Either you offer something up to the universe, or down into self-indulgence. If Coltrane represents a prayer offered to the universe, Was (Not Was) is like itching powder or the joke gum that turns your teeth black.

David: For us, it's the difference between

being an epic artist and a Haiku writer.

We're definitely 17 syllables, and out.

That's a new Teamster policy, by the way — one Haiku and you can retire.

Our role is to be *agents provocateurs* — to create a little diversion, so someone can go in and steal something.

You left the audience hanging many years ago with the legacy and the power of "Walk The Dinosaur."

Don: Thank you for remembering.

David: Power! [*Laughs demonically.*]

How can you surpass that pinnacle?

David: Let me put it this way: There's a whole new thing coming in music.

Tracy Chapman, who just came out with "Fast Car" — was that this year?

Anyway, I love that record. So, you got folk. The 3/4 thing is coming back, and Don and I are ready.

It's Folka-Polka — Folka-Polka!

By the way, David, what have you been

doing for the past eight years?

David: I have been cultivating a relationship with the "Helper" to the Dalai Lama, and it's not so much *spiritual* as it is *material* enlightenment I am after.

And Don — isn't it something? What a success story.

David: I knew it from the beginning. I first saw Don performing at a talent show in Junior High, doing a couple of songs, and really, I didn't know shit about contemporary music. He was doing Dylan before I'd heard of Dylan. This was the essence. It couldn't have been any better, even if it had been Dylan.

Does this new workshop have a name?

David: Yes, we call it The Estrogen Laboratory.

Will you have a recording studio here?

Don: Yes, right in this room, in two

weeks — you won't believe it.

David: What do you picture in here?

Don: Red movie theater curtains all

Suspects: David and Don Was

Origins: Detroit

Occupations: Musicians, Writers, Producers

Residence: Los Angeles

Notes: Suspects first met in the 7th grade and began a creative friendship that led to publishing an underground newspaper, staging unusual school performances, and writing songs. After graduation, sax-and-flutist David left for L.A. and became a music critic for the L.A. *Herald-Examiner*, while Don made a living in Detroit as a session bass player.

David and Don began a long-distance writing partnership and were reunited when signed as a band in 1980. They enlisted the talents of Detroit's leading funk rockers and released four albums, featuring such guests as Ozzy Osbourne, Mitch Ryder, Leonard Cohen, Mel Torme, Frank Sinatra, Jr., and Iggy Pop. Was (Not Was) gained international fame in 1989 with the hit "Walk The Dinosaur" and stopped recording in 1990. For most of the '90s, David and Don have worked separately, achieving considerable individual notoriety and success.

Suspects were photographed during their 1998 reunion at a music conference sponsored by the MPGA. Interrogation took place at the new offices and studios of Was (Not Was). Suspicious activity is expected from the "music producers" behind such phenomena as *Voodoo Lounge* (Don, left in the photos) and *The X-Files* (David).



PHOTOS BY MR. BONZAI



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around and parachutes for the ceiling. How will Was (Not Was) stay in touch with the pulse of the culture and the record-buying public?

David: It's not so much *feeling* the pulse as *creating* the pulse. You know what I'm sayin'? The culture itself has no pulse. That's why you have art — to remind people of the wholeness of the human experience and not just the fragmentation of it.

Don: The beauty of the last eight years is that we've maneuvered ourselves

into the position of Montana Survivalists. We're loaded with recording gear and we truly answer to no one anymore. We do whatever we want now. It's a matter of shutting off the current pulse. We chased it for ten years and it worked — but it ruined us.

Is this an alternative to your work as producers?

Don: What I've seen as a producer is a small handful of guys like Keith, Willie, and Dylan who know how to let go and

play in the moment and not think about it. They lose musical self-consciousness. It will be good to do that with David — without some well-intentioned benefactors breathing down our necks looking for reimbursement. Just to let go for the sake of letting go.

What other personnel are members of this group?

Don: It's pretty hard to imagine doing anything without Sweet Pea Atkinson. On one level, I guess we wish that we were good



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soul singers, and this is something that goes to the essence of Sweet Pea. He vibrates in a way that matches our dreams. He's much more than just a great soul singer; he's a great man. David: And for us, to work with Sweet Pea and our wacky musical instincts, to have this anchor above a ship that's made of...Help me out of this metaphor, Don...

Don: Matzoh? David: Yes. I think both of us have a taste for the kind of laughs that the surrealists went for. Like gobbin' in the face of the bourgeoisie. **Let's rip apart these puny little categories of music — I can't understand the charts anymore.** Don: It's become like sports, and following the baseball standings. It's a separate entertainment: following the charts. You might as well make a record and follow baseball as make a record and follow the charts. They're not connected.

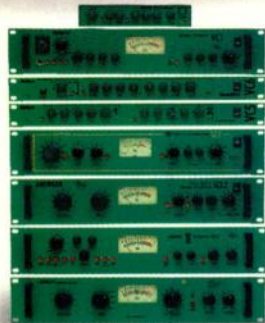
What's the good news about music today? Don: In any period there is great music being created, and today the options for receiving information are almost infinite. Until they figure out how to regulate what you can send through a modem. **Is it a good time for young people to start a career in music?**

David: Ask Tony Was. Don: Yeah, my kid's in a band called Eve Six. I advised him to give up his Trustee Scholarship at USC and get in the van and drive around if he wanted to learn about music. I spent the better part of a year conditioning him for all the disappointments and betrayals that lay ahead. He put out a record and it's a hit. He was in high school two years ago. David: There's your answer. A better time than ever.

Don: He called me up the other night and said, "The record went Gold, Dad." I said, "Fantastic — Was (Not Was) never had a Gold record." He said he was sorry, and I told him I didn't look at it that way. "Our DNA is doing great." He was truly relieved.

David: However, Don's DNA also gets 30 percent of the take. Let me say this, Bonzai: as folk culture becomes a speck in the rear view mirror — beware. Bartok even went back to them villages to cop some new sounds, new rhythms — that were old. That's the cool thing about a couple of genre students like ourselves, if you can make what's old, new again. I think of us as fundamentally about *funk*. Don's whole notion for this band was "put anything over a beat." Bebop trumpet, acid-rock guitar — which was very in-vogue at the time.

Was (Not Was) is a cultural collider, an accelerator that just bombs the notions of what can hang together. That's what we are about at the *root*. We got waylaid by well-meaning commercial types who fed millions into us to try and spiff us up and make us presentable. It worked to our worldly



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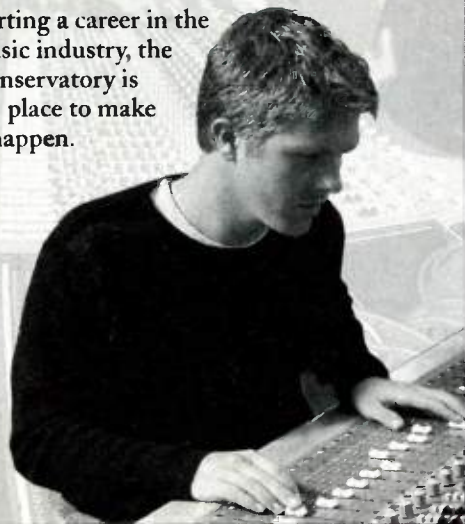
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BONZAI BEAT

credit, but to our artistic demerit. As the kid's say, "Keep it real."

What can we imagine in your upcoming music?

Don: There's no telling. Improvise, adapt, overcome. That was a big lesson for me. I had met Keith Richards only once, and it was decided that for the first time, for *Voodoo Lounge*, the Rolling Stones were going to plan the album before they started recording. We'd go into the studio and he could sing final vocals with the band.

There were no songs written, and I got this fax from Keith: "Be in Dublin next week to start the album." I faxed him back that I thought we were going to plan it all out. What are we doing? He faxed back and said: "That's for me to know and you to find out. When you get to Dublin: improvise, adapt, overcome, and P-fucking-S don't paint yourself into a corner." I was crushed, but if I had gone to Dublin with a plan, I simply would have had to take a week to forget it all.

God knows what we will come up with. To go in with a plan would be already missing the boat. The best people I've ever seen are the ones who just go fishing. How can you go fishing and say, "I'm gonna find five trout today in that spot."

Well, here we are — a new era for the Was Brothers.

David: Yes, this is like when baseball commissioner Ford Frick met Louis Pasteur for the first time. Fenway Park, in the year...Don, help me.

Don: I believe it was 1939.

David: Yes, 1939, and Frick said, "Pasteur, you are a *legend*," pronounced in the French fashion. That's all he said.

Don, it's a new era, it's our era.

Don: If you could assign Jungian meaning to it, you could say that, in life, what works for breakfast doesn't work for dinner. The things that we needed to do when we were 20, we did, and they are out of the way. They won't work for us anymore, and they are not goals to aspire to. What's left to be scavenged from those things is internalized, and now we've got to find something that satisfies us for the rest of our lives. **EQ**



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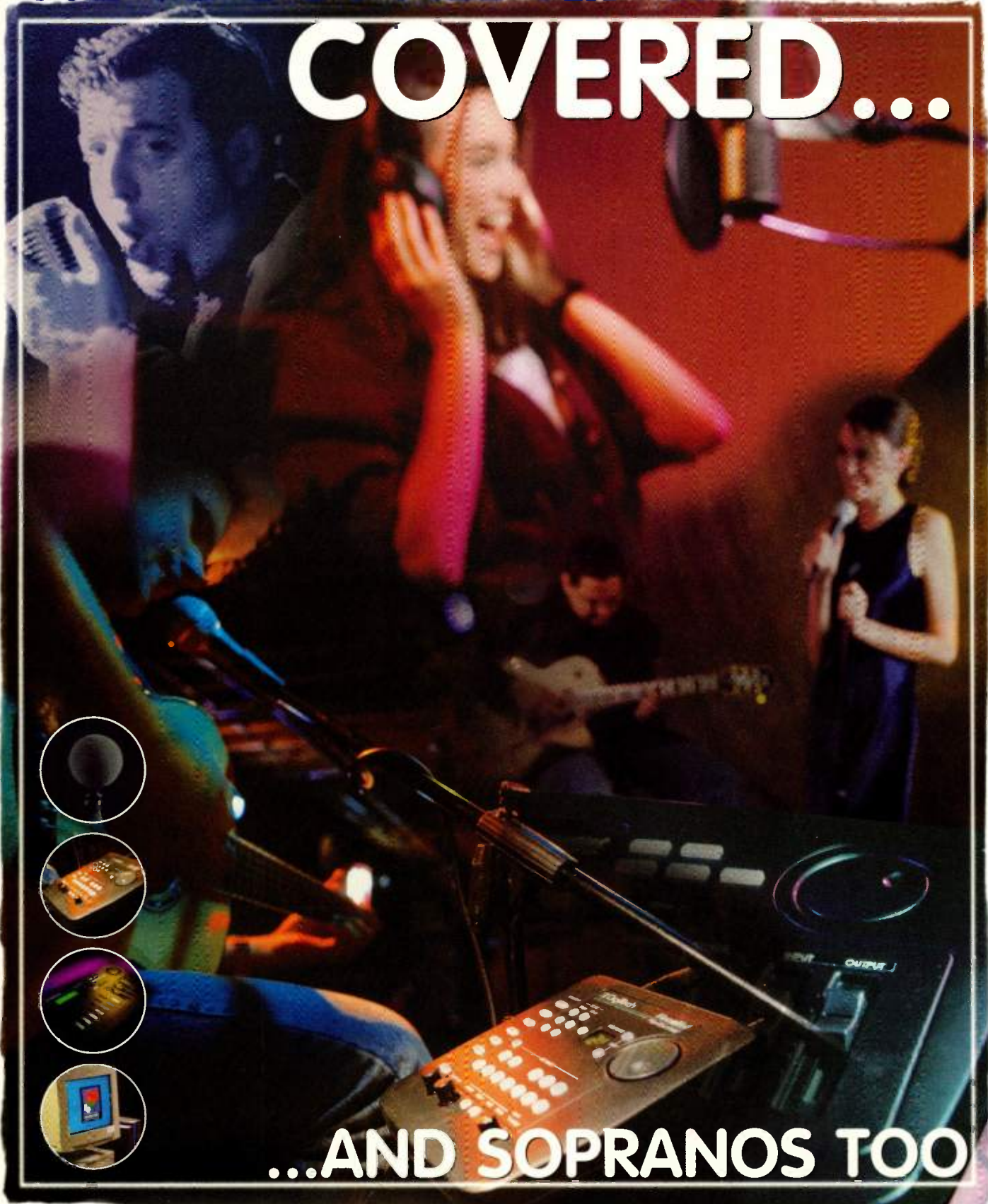
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Cyber Shopping

The inside scoop on buying pro audio gear on the Internet

BY SCOTT RUBIN

Most of us love to gear shop, and some are even using the Internet to make purchases. Quickly becoming as popular as mail-order shopping, there are some real advantages to ordering your toys through a modem. Special sales available to Internet orders only and deep detail in product description make logging on to the 'Net to check for gear quite valuable. What follows are tips for cyber shopping, and you'll soon see — whether you want the latest digital multitrack or a vintage tube compressor — choosing the Internet opens up a door of possibilities.

Let's start at the most logical place — the computer. Most of you who are into computers know the benefits of a 56 K modem. I spent lots of time on the net as a 28.8 user, and now with my 56 K connect, I'm much happier with time spent browsing and searching for info. However, the biggest factor affecting your search is which search engine you want to use. There are numerous options to choose from, including America Online's NetFind, Netscape, Microsoft Network, Yahoo, Excite, Lycos, Alta Vista, and InfoSeek to name just a few. I prefer to use Yahoo because, in my opinion, it worked the best. As with any search, you'll need patience and discipline to not click wildly on things until they completely load. I started out looking for deals

on new gear or equipment that most retailers would stock (not vintage gear or discontinued items).

At first I tried a combination of words including "pro audio," "recording," "retailers," and some others, but, by using the keywords "pro audio instruments," I was given more than 50 choices (www.yahoo.com/business_and_economy/companies/music/instruments/retailers).

This was a good group of sites that included major retailers such as Sweetwater (www.sweetwater.com), Guitar Center (www.guitarcenter.com), and Thoroughbred Music (www.orlandomusic.com or www.tbred-music.com) among others. Notably absent from the long list of retailers was Sam Ash Music. The closest thing I found to Sam Ash was a Web site for their Music Institute. If you like, once you're at a particular Web site, make sure you look to join the mailing list. They often offer specials via the mail or Internet.

I took a look at New London, CT-based Caruso Music (www.caruso.net) and picked recording consoles as my product of choice. Not only was I given

a list of the products they offered, but they had links to almost half of them. (By clicking on a link, you can automatically be sent to the product's Web site for more in-depth information). The site had everything I wanted to see. Intrigued by their used-gear link, I checked out the contents and was amazed at how many different products they had to offer, all with the prices posted to them. I especially liked their FedEx tracking software that would allow you to check on products you ordered.

Off to another site, the big daddy of them all, Guitar Center. The Web site is what you'd expect from one of the country's largest music retailers. They have everything on the site you'd want to look at. I took a shot at buying a microphone. Unfortunately, I wasn't able to purchase anything through the site. I had information on all of their locations, their guaranteed lowest price, the industry-certified sales staff, but nothing about purchasing an SM58 over the 'Net.

Sweetwater, on the other hand, has long been one of the major players in the retail/mail-order game. I was blown

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Thursday, September 17, 1998

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away by the information available on the products they sell. I was able to get tons of insight to products of my choosing. One of the coolest things I saw was a "Trading Post." Here consumers were able to trade with one another for various products. There were amplifiers, mixers, amps, guitars, and much more. Once you pick the product listed, it shows you the pricing information and who to contact for more info. Between the blowout specials that they offered and the search engine at the site, I found Sweetwater to be a helpful guide to buying gear. They also have an 800 number for telephone sales.

At the Musicians Friend's Web site (www.musiciansfriend.com), the thing that caught my eye was the "Internet Only" specials that they advertised. There were effects processors, guitars, basses, and other items. All were brand new, just overstocked. On average, they were about \$50 cheaper than at the normal retail prices. I also was suckered into ordering a full-color catalog. Although I get enough mail as it is, the site was one of the only ones to offer a direct Internet ordering system. Just pick your product (studio, keyboards etc.) and then pick and choose from lots of manufacturers.

As with all of the sites you can enter, there are a few things to look for at each one. An 800 number, e-mail set-up, links to major manufacturers, special buys, a used-gear list, and other helpful sales aids make for ease of shopping. The 800 number is good for those of you who would rather give your credit card information to a stranger on the phone than transmit it over the 'Net. Many sites have secured transactions, and it is an important feature to look for before purchasing. How do you know if they have? Most are pretty proud of it, and have something on the home page touting whatever service they use to provide security.

USING NEW TECH TO FIND OLD TECH

Let's take a look into some of the vintage gear sellers. Back to the Yahoo search engine. By inputting "vintage pro audio and recording equipment," I came up with two main lists. As before, the basic Web site of www.yahoo.com/business_and_economy/companies/music/equipment/recording_equipment.com yielded an excellent selections of choices. I took a stab at Into-It Audio (www.intoitaudio.com) and boy am I glad I did. I found everything from Neve 1081 MicPre/EQs and a Pultec HLF-3C passive bandpass filter to a RCA 77 vintage rib-

bon mic to various consoles from Neve, Telefunken, Harrison, and others. (If writing articles paid better, I might have ordered a few of the toys.) On to another site, Odyssey Pro Sound (www.odysseyprosound.com): Here I found more cool gear, more great deals, and more links. They had a very effective ordering system for Internet purchases via all major credit cards. I clicked on their "Used Gear" icon and found myself in a world of classic mics, EQs, preamps, compressors, and consoles. I thought the prices were reasonable for such vintage gear. In addition, I found the searching for such rare and out-of-date gear to be exciting. I never knew how many discontinued and classic pieces are floating around. I found compressors, delays, multieffects processors, faders, knobs, and everything imaginable.

Pro Audio Design (www.proaudiodesign.com) was another site I enjoyed browsing through. It's like window shopping for API mic pres from the comfort of your own home. Price, product description, and when the piece first became listed on the site were all valuable tidbits of info. By the way, at this site, if you see something you like but think the price is too high, they ask you to make an offer. They didn't have an 800 number, but they did provide e-mail and a 7-day money back guarantee.

I could go on to list numerous other sites, but you should spend time at your search engine of choice and look for the special things you've been searching for. Another excellent idea is the chat rooms and newsgroups (e.g., rec.audio.pro) about music and recording that pop up all over the place. Talking to a new friend about where they buy their vintage gear opens up new networks and numerous options. In addition, check out the "electronic bulletin boards" or postings as to buying and selling gear.

In today's e-commerce world, buying equipment on the Internet is probably safer than telling your credit card number to a clerk over the phone. Using the tools of technology will allow you access to areas that were unthinkable just a few short years ago. The bottom line is that there are people out there with gear, wanting to trade, sell, and buy. With the addition of the Internet to our social structure, it's like having a link to other countries to do business with. Without it, we'd be using the yellow pages to find a Neve EQ or a PCM42. Get connected and happy shopping. **EQ**

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An Amazing Feat

A behind-the-board look at the recording of Little Feat's new album, *Under The Radar*

BY STEVE LA CERRA

Recording an album at a project studio can be a difficult task. When you add in the pressure of a major-label release for a killer band that wants to record live — and the fact that some of their past works have been audiophile-quality releases engineered by guys like George Massenburg and Ed Cherney — coming up with a great-sounding album can be an amazing feat. Such was the case when engineer Gil Morales began to tackle recording the latest Little Feat CD, *Under The Radar*, at the private studio of Feat guitarist Paul Barrere.

When asked what made *Under The Radar* different from other projects he's worked on in the past, Gil Morales explains, "Recording Little Feat is not a simple kind of project where you get a drum machine going, record some sequenced parts, do a vocal, and then you have a record. You have a very popular group of musicians that play well together and have a long history of being a sort of 'audiophile' group, so it has to sound good. The pressure was on to deliver a record that would stand up against 12 previous records that all sound great. To do that in Paul Barrere's studio would be a challenge. Even meeting that standard in a commercial studio would be a challenge!"

Under The Radar was co-produced by Barrere and Little Feat keyboardist Billy Payne, and

engineered by Morales and Jerry Manuel.

Before Morales and Little Feat began the recording process in earnest, Paul's studio needed some tweaks. "We started by replacing most of the wiring in Paul's studio with Monster Cable," begins Gil, "which was a major step in improving the sound of the studio. We also brought in some extra gear, but the wiring was where we made significant changes. Moderate gear can sound very good if it's wired properly. Actually, you could put a wire recorder in front of Little Feat and it'll sound good!"

Instead of using the latter, Gil brought in a single Panasonic DA7 digital recording console and four TASCAM DA-38 recorders as the foundation for the recording. According to Morales, "Since we were going to be recording the whole band live, we assembled the studio with a patchbay so that we could quickly make changes. One thing about working with Little Feat is that they will change directions musically just like that. They'll be

doing one song, and when they finish it, they'll want to go right into something completely different. You can't be spending a lot of time reconfiguring the studio."

Morales leaned on the DA7 to make those rapid changes, coming up with console scene setups for different recording situations. "We had a console preset for overdub sessions," Gil reveals, "and different preset scenes for tracking or mixing. For example, when we were tracking, we'd need two or three headphone mixes to accommodate the band. So a tracking preset would have the first eight channels configured as mic inputs, the rest of the inputs as tape returns for the DA-38's, and the auxes as headphone sends." (He also used outboard pres for additional mics.) "Then I'd configure an overdub setup with one headphone mix for a single musician, and the other auxes used for effect sends. I was able to make those kinds of changes instantly with the DA7, and in a few cases it made a huge difference in the flow of the session."

"There was one case where guitarist



PAUL'S PLACE: Little Feat's Paul Barrere co-produced the band's new album with keyboardist Billy Payne at Barrere's project studio.

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CIRCLE 33 ON FREE INFO CARD

World Radio History

Fred Tackett and I were doing overdubs, and suddenly the band showed up wanting to track a song immediately. All I needed to do was reset the DA7 to the tracking scene and my setup was there. Little Feat doesn't do 30 takes of a track, and the technical stuff can ruin a moment for them. By the time you move this, plug that, and boot the other thing, the excitement is gone. Their headphone mixes were already pretty close to where they were on previous sessions, so I didn't have to start headphone mixes and rough mixes from scratch. That kept the creative flow going."

ISOLATION SITUATION

When asked how he maintained isolation of the various instruments while record-



RADAR LOVERS: The production crew for *Under The Radar* (from left to right) — engineer Jerry Manuel, Paul Barrere, and engineer Gil Morales with Barrere's Panasonic DA7 console.

ing live, Gil replies, "The whole point in a situation like this is that you don't get isolation. You can do basic things like cover the guitar amps with blankets so they don't completely wipe out the drum overheads, or put the singer down the hall — the stuff that we always end up doing in project studios. But you're never going to get the guitar sound completely out of the drums in a situation where they are only six feet apart. I had (drummer) Richie Hayward six feet in front of the console, and three feet away on my left were both Paul and Fred's amps. It makes the whole thing more rock 'n' roll."

To solve the problem of generating several simultaneous headphone mixes for the

various band members, Gil used a "more me" approach. Two different stereo headphone mixes were routed from the DA7 into several headphone distribution boxes. Each box has a stereo input and an aux input that can be mixed together. Morales dedicated additional aux sends from the DA7 to specific instruments (for example, send 5 from the DA7 was guitar only). These sends were selectively patched into the aux input on the headphone boxes, giving the musicians control over the balance between a stereo band mix and their own instrument.

IN-DISCRETE

Working without a control room left Morales monitoring all of the sessions on headphones. "It can be hard to

close, making sure that each of them sounded good because they are the foundation. Once you get those right, you can add in the other mics as spot mics." Gil pays close attention to the phase relationship between microphones on the kit. "On a big console, you have a phase meter, and when someone spends a million dollars to build a studio, you can be pretty sure that everything is going to be wired in-phase. But in a project situation, you don't have that luxury. I have this little B&K scope that I can put across any two inputs to make sure they're in-phase. When I get to the mastering lab, I don't want any surprises. Even in the best studio there's no way that every mic on a drum kit will be in-phase, but if you listen carefully, you might hear something weird happening with the floor tom or kick drum. You have to trust your ears because the scope isn't mixing for you, but it's useful in situations where I'm listening back on headphones."

STEALTH MIXING

Under The Radar was also mixed at Barrere's studio. Morales listened on "a few different sets of monitors, including Tannoy SRM10B's and JBLs that Paul has had as the band's reference for a number of years. We also used a pair of small Fostex monitors that sound like the most amazing ghetto blaster I've ever heard. I want to know what it's going to sound like on the radio or in the car." The digital stereo output of the DA7 was patched into a TC Electronic Finalizer that Gil used "sparingly across the stereo bus. Compression in general is a two-edged sword — once it's on it's never coming off, so I don't like to slam a stereo bus too heavily."

Gil confesses that he employed a rather unorthodox mixing approach: "One of the walls in Paul's studio is actually a set of glass doors leading into his backyard. We'd leave those doors open, walk outside, and do what we used to call the 'hall test.' You leave the control room open, walk down the hallway, and listen. Sometimes when you're not in front of the speakers the perspective changes. But if the mix stands up between being in front of the speakers and being 60 feet off-axis down the hallway, then you know you're going somewhere."

"In many project studios, the room is not big enough to propagate bottom-end waves. By being out of the room, 20 or 30 feet away from the speakers, you can hear the fundamental of those sounds and

continued on page 157

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CIRCLE 27 ON FREE INFO CARD

Killen Time

Producer-engineer Kevin Killen brings a recording perspective from across the seas

BY BOBBY OWSINSKI

In a prime example of how people interact today via high technology, I bumped into engineer-producer-mixer extraordinaire Kevin Killen via an Internet newsgroup. It seemed that a popular thread turned to how the bass sound on Peter Gabriel's "Sledgehammer" was recorded, and all manner of know-it-alls replied with the wildest of supposed methods and equipment, all of which were wrong. The correct answer (Tony Levin's Musicman bass straight into the desk with a little compression) eventually emerged from the real voice of authority: Kevin Killen. Mr. Killen not only recorded and mixed Gabriel's seminal So, but also U2, Elvis Costello, Stevie Nicks, Bryan Ferry, and Patty Smith to name just a few. A multiple Grammy nominee and mixer for Shawn Colvin's Grammy-winning Steady On, Kevin was kind enough to give me the British perspective on mixing for my upcoming book, Mixdown.

EQ: Can you hear the finished product in your head before you start mixing?
 Kevin Killen: I can in certain instances. If I'm hired just to mix a project and I'm not intimately familiar with the material, I have just a general overview as to what I'd like it to sound like. As soon as I get in the studio, that's where I really start thinking about pushing or pulling a track one way or the other. For stuff that I've recorded, I usually have a pretty clear vision of what I want and actually try to start mixing as I'm recording. I like to work 24-track (rather than 48), so I try to make decisions based upon that. I'm always kind of mixing in advance.

Where do you start your mix?
 Usually the vocal. Maybe some of the

rhythm section. I listen to what the strengths or weaknesses are and then build the track up around that. At some point maybe I'll just pop the vocal out and work on some of the rhythm stuff. I found that if I start with the vocal first, I finish a lot more quickly than if I start from the ground up. If you're dealing with an artist who's a strong

storyteller, that's going to be the main focus anyway.

Do you have a method for setting levels?

I've never subscribed to the point of view that there is a method. I just go with the flow. I had an experience about three years ago on a Stevie Nicks record with Glyn Johns, who's been



PHOTO BY JULIAN JAMIE

CHILLIN' KILLEN: Kevin Killen discusses the techniques he uses to make classic songs with Elvis Costello, U2, and Peter Gabriel.

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Credits: Orgazmo • Field of Dreams • Hunt for Red October • Flight of the Navigator



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making records since the '50s. We were mixing without automation, and he would just push the faders up and within a minute or two he would have this great mix. Then he would just say that he didn't like it and pull it back down again and push it back up. I relearned that the great art of mixing is the fact that the track will gel almost by itself if it was well performed and reasonably well recorded. I find that the stuff that you really have to work a lot harder on is the stuff that has been iso-

lated and really worked on. The tracks all end up sounding like disparate elements, and you have to find a way to make them bleed together. **What's your approach to equalization?** I would imagine that I apply EQ based on my own hearing curves, whatever they are. I definitely hear a lot more high end than other people, maybe because my ears stick out and aren't pinned back flat to the head like other people's ears. Because of that, I tend not to over-exaggerate EQ. I try to get it

sounding smooth. Most people mix in a much more aggressive fashion. I don't have individual instrument curves that I keep coming back to because every bass drum is different and every player is different, so I don't have particular settings or sounds that I go for except to make it sound as musical and pleasurable as possible. **Do you have an approach to panning?**

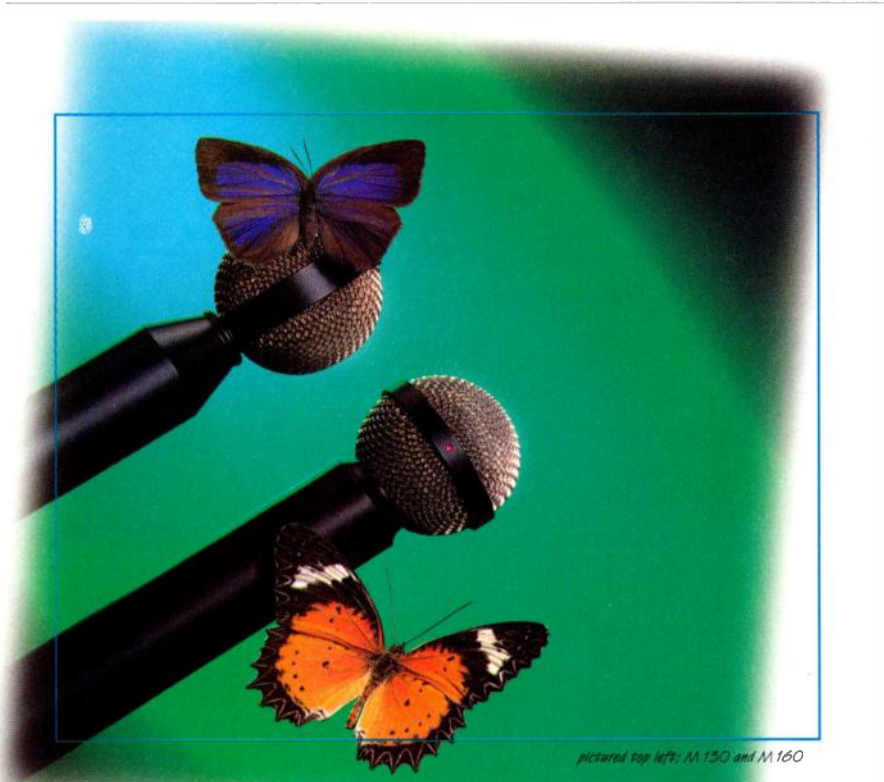
That's one of the things that I actually spend a lot of time on. I will get a balance that I like, then I'll just try moving the panning around. I might spend a couple of hours experimenting, because, for me, that is the kind of detail that can create a lot of space in a mix. I love to explore and create holes for instruments to sit in, but I'm not into what I consider "gimmicks," like Spatializers, to make the panning seem wider than the speakers are.

How about compression?

Sometimes, when I can get it to work, I really like it. I listen to other people's mixes and say, "That sounds amazing," but when I try it, I can never get it to sound the same way. I tend to be quite modest on compression because my rationale is that you can always add more, but you can never take it off. Since it will probably be applied at a later point during mastering and broadcast, I tend to err on the side of caution.

Since SSL hit the marketplace, I know what a temptation it is to set up the quad bus compressor even before you start your mix. I tried that for a while, but I found out that I didn't like the way it sounded. What I came up with instead was almost like sidechain compression, where you take a couple of groups on the console and assign them

I definitely hear a lot more high end than other people, maybe because my ears stick out and aren't pinned back flat to the head like other people's ears.



pictured top left: M150 and M160

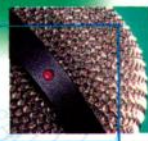
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Web Site Quick Picks III

Ten more sites that will provide needed information, shareware, and important updates

BY CRAIG ANDERTON

On the 'Net, the truth is out there somewhere — from shareware to updates, schematics to MIDI files....

Welcome to the third Web Site Quick Picks, featuring ten more sites that are well worth the connect time. Clear out some space on your hard drive for downloads, dial up your favorite service, and get ready to surf.

- **Synthfool** (www.synthfool.com). This site has schematics for vintage synth circuits, including Aries, ARP, Digisound, EMU, Minimoog mods, Oberheim, Polyfusion, and others. (Curious about the circuits used in the TB-303's analog section? Find out here.) There are also Roland service manuals, brochures, and pictures of various synths, blank patch sheets, links, and a whole lot more. This site's sort of a cross between a museum and service center for vintage synthesizers.

- **Macintosh MIDI User's Internet Guide** (www.aitech.ac.jp/~ckelly/mmug.html). Lots of resources for Mac musicians, including links to pages with downloadable shareware and demos. Use the Macintalk speech synth to sing songs on your Mac, download a universal MIDI librarian, find MIDI Tools for HyperCard, and more; arguably the most useful element is a section on basics and links to other sites. Not the ultimate Mac music resource, but there's certainly enough here to keep you busy for a while.

- **The World of Drums and Drumming** (www.nowopen.com/drums/newdrums.htm#menu). This looks like a one-man show, but it's a pretty cool resource that is useful not just for traditional drummers, but those with an electronic drummer as well. There are standard MIDI drum files for downloading, links to pages with downloadable samples (TR-



DRUMS AND DRUMMING: Much more than just drummer jokes, but they're included, too.



MILES OF FILES: Drivers, shareware, and lots of other goodies for Windows.

808, -909, etc.), drum-oriented software (groove generators, virtual drum machines, drum synthesizers, etc.), a chat area, and, of course, drummer jokes.

- **Propellerheads** ([\[heads.se\]\(http://heads.se\)\). This site is for fans of ReBirth and ReCycle, Propellerhead's best-known products. There's a good selection of free ReBirth mods and songs, along with utility files and tech notes \(such as](http://www.propeller-

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Morris Day, (r) stops into to talk with Michael Vaughn

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TECHNIQUES

a document explaining exactly what ReWire does). The links are also excellent, as they transport you to a bunch of sites with additional mods, samples, and all manner of ReBirth esoterica. Tip: Click on "Site News" first to find out which mods were most recently uploaded.

- **MIDI Guitar Internet Unofficial Home Page** (www.epix.net/~joelc/midi_git.html). Although this site contains mostly links to other sources of information, there is some useful original material. For example, find out what the pins on the GK-2 divided pickup connector do, and where to get the infamous 13-pin connectors used with the GK-2. There's also quite a bit of product information, which should be helpful for those thinking of taking the plunge into MIDI guitar.

- **Infusion Systems** (www.infusionsystems.com). While I prefer to spotlight sites that offer something for nothing, this company site advertises a MIDI alternate controller that looks really cool. It accepts up to 32 sensors; Infusion offers sensors for light, heat, acceleration, pressure, proximity, tension, breath, etc., for conversion into MIDI data streams. Included software allows setting threshold and responses of the various sensors. If you're into experimental art, installations, or just want to add major expressiveness to your MIDI boxes, this is a pretty intriguing option.

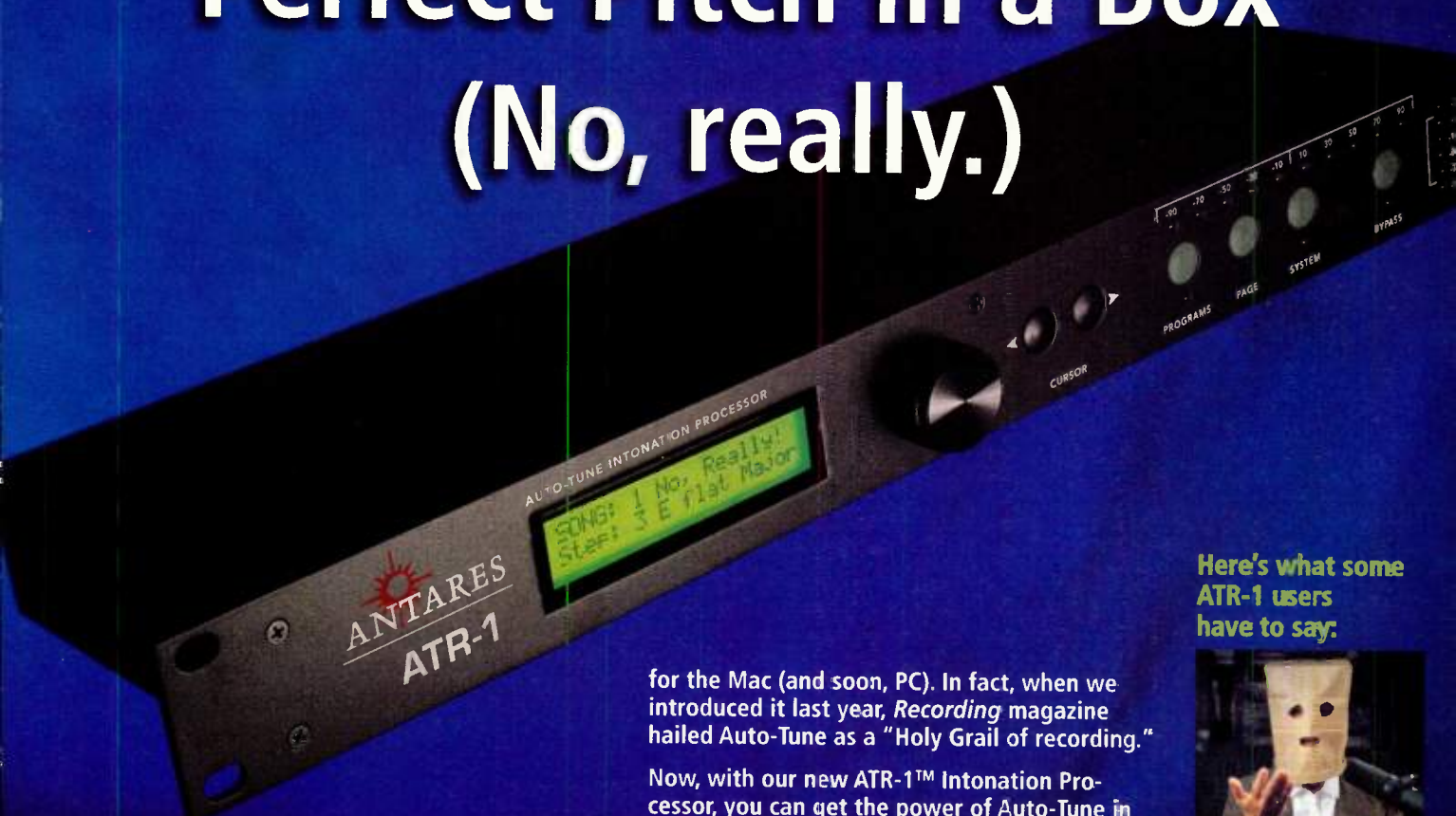
- **Circuit Cookbook Archive** (www.ee.ualberta.ca/~charro/cookbook/audio/guitar). Scroll down to "Breakdown of Files by Subject," click on "Audio," then click on "Guitar-Related Circuits" for a batch o' guitar effects, including commercially manufactured boxes, custom designs, and mods. (If you're an electronics hobbyist, some of the other circuits on the site are pretty cool, too.)

- **Polyhedric Software** (www.polyhedric.com). The main item of interest is the software page, with two excellent shareware programs (the ACID WAV digital audio editor and Mellosotron computer-based sampler). There's also a free wavetable synth for playing back MIDI files without a hardware wavetable card, which you can also use for "MIDI to audio" rendering. This is a site where there's not a lot of quantity, but the quality is on-target.

- **Winfiles.com Windows 95/98 Multimedia and Graphics Tools**

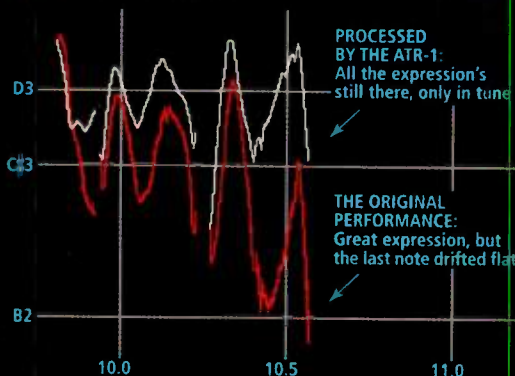
continued on page 159

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TECHNIQUES

flawlessly, right? Wrong! In the time that I've dealt with 98 (I had a Beta 3 release six months before it hit the streets, as well as the retail version), I've had more install problems and catastrophic program failures than you could shake 16 techies at! If you're going to upgrade, make sure you save your crucial files to floppies or CD and then backup your entire program drive (I recommend Drive Image from powerquest.com.) If you don't, you may be very, very sorry.

• **Hasta la bye-bye, Fax.** Although Microsoft has nixed MS Fax from 98, I found out from my buddy, Craig Anderson, that you can fax from the new OS. Here's how: You'll have to install WMS.EXE (Windows Messaging) from the /tools/oldwin95 folder on the Windows 98 distribution CD. Then, do a find for AWFAX.EXE and click on that to install the fax software. It's the Windows 95 fax, but I've been told that it works just fine.

• **It's already a Dinosaur!** Microsoft is telling the business community to skip over 98 altogether and get NT. This is the last of the "Windows 9X series," the next stop is Windows NT 5.0, a whole new operating system. So you might want to stick with 95 until the whole world changes again in just over a year.

A side note: I've installed the Beta of NT 5.0 onto my main PC and it seems to be much more stable. The problem, however, is that not all programs and hardware will run on it. No matter which OS you use, I strongly advise that you make sure any software that you buy is NT compatible. It'll save you from having to buy it twice in a year or so.

A MAN'S PERSONAL SAGA

I've installed 98 onto four computers. Out of this, only one upgraded without a hitch. The home PC (which has the least hardware) went perfectly. My studio PC was upgrade hell. After five attempts, I gave up the idea of upgrading and went for a fresh install, which still didn't work. Once I had a stable hardware/OS install, 98 would not install my favorite sequencing software P-E-R-I-O-D! No reasons, no nothing! Just HAL 2000 saying, "I'm sorry, Dave, I can't do that!"

After killing another studio's PC and watching another's stability trail off into feeble-land, I decided to reinstall 95 and call it a day (actually, a frustrating week!) If it works for you, pal, more power to ya! As for me, I'm going to start preparing for NT.



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World Radio History





In My Room

Former Beach Boy and master producer Brian Wilson records his latest effort, *Imagination*, in his project studio

By Alan di Perna

In My Room

"My wife knew I needed the right environment to make music in," says Brian Wilson. The right environment, in the case of the former Beach Boys leader, songwriter, and producer, is a 4000 square-foot SSL recording facility on the lower floor of Wilson's second home in the Chicago suburb of St. Charles, Illinois. This is where he did

whole cozy setup to their wives, who discovered St. Charles on an antiquing foray.

"The studio took seven months to build," says Wilson. "Meanwhile, Joe and I were writing a lot of songs. And as soon as the studio was done, we started recording there."

The end result is, as Joe Thomas puts it, "not your average project studio.

warm-up exercise before work on the album could begin in earnest.

"The first song that we did together for the new album was 'Let Him Run Wild' [an old Beach Boys song]," Thomas recounts. "It was the first record I ever bought as kid, the B side to 'California Girls.' So I said to Brian, 'How about doing that one?' And he said, 'As a matter of fact, I've always wanted to redo that.'"

As it turns out, Wilson has always been dissatisfied with his vocal on the original. "I sounded like a whimpering little girl," he complains, "a whining little girl, you know? I was so self-conscious about that one particular song that I decided to show people I could sing it better. So I brought the key down about three pitches. And, sure enough, I did sing it better."

The fact that Wilson can still be so profoundly irked by a vocal track he laid down back in 1965 is a mark of how seriously and personally he takes this stuff. "You hear these stories about the perfectionist side of Brian," says Joe Thomas: "Stories of there being 15 or 20 takes of a song on *Pet Sounds*. I think the closest we came to that on this album was the song 'Happy

Days.' We recorded that song seven different times — seven completely different versions, each one absolutely nothing like the others — before we got it right."

For each song, Wilson and Thomas would typically start by mapping out an arrangement via MIDI using Opcode Studio Vision 3.5.2 sequencing software running on the studio's Macintosh 9600. (The same computer was also used for the Pro Tools setup.) "We've got two controllers," Thomas elaborates, "an Alesis QS8 and a Yamaha P200 Clavinova." Modules at the studio include a Kurzweil K2500, Roland JV2080 with expansion cards, a Proteus 2 (orchestral), Alesis DM5, Ensoniq MR rack, and Studio Electronics SE-1 rack-mount Minimoogs, all interfaced with the Mac via an Opcode Studio 4.



OOHS 'N' AAHS: Wilson recorded all of the background vocals himself, with some songs using over 20 vocal tracks.

most of the work on his new album, *Imagination*. The disc is replete with Wilson's sunshine harmonies and trademark lavish arrangements. It's a glowing affirmation from a man who has emerged victorious from years of well-publicized psychological and drug dependency problems.

Wilson still spends a lot of time at his house in Beverly Hills in sunny California. His St. Charles residence is a hybrid retreat/workplace: a safe haven from the crazy world of L.A. and the music biz. The house is on lakefront property. The place next door belongs to Wilson's coproducer, Joe Thomas, who has been part of Brian's team since the 1996 Beach Boys tribute album *Stars and Stripes*. The two men actually owe the

We have an 80-input SSL G+ console that's kind of the cornerstone. We record with two Otari DTR 900's [digital 32-track tape machines]. And for the more intricate sounds we've got a Studer A827 [analog 24-track machine]. We'll put drums, bass, or certain other instruments on that. Then we've got 16 tracks of recording in our Pro Tools system. So it's about 104 tracks in all. But we usually go over that and have to bounce down."

Wilson's production techniques are famously elaborate and, at times, mysterious, even to close collaborators. He's known to be an obsessive perfectionist. Abundant patience is a prerequisite for anyone who works with him. Thomas had to cut innumerable versions of "Proud Mary" with Wilson as a

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In My Room

"Usually, Brian or I will use the synthesized sounds to work out an arrangement. Then we'll have the computer print out an actual score. At that point, we'll call in live musicians and they can play the song exactly as Brian and I had arranged it. So even though we used a lot of synthesizers in the arranging process, 98 percent of the sounds on the album are live players."

Although most of the tracking dates took place in Wilson's project studio, some were done at Masterfonics in Nashville and Ocean Way in Los Angeles. "Most of the time, the reason we would travel was for musicians," says Frank Pappalardo, who engineered the project. "It would just be cheaper for me, Joe, and Brian to fly to Nashville than to ship a lot of players and all their

gear up here. Format compatibility was sometimes a problem, though. The Otari 1-inch 32-track is not a format people have very much anymore. But it's still a popular format in Nashville, so we never had any real problem getting those machines down there. When we would go to Ocean Way, however, we were working 24-track analog. That's one thing about analog: it's a format you can go anywhere with. I also think one reason why this album has an older, classic kind of sound is because some of the tracks are on analog."

The current Ocean Way facility is in part comprised of what used to be Western Recorders, where many of the old Beach Boys hits were created. "It was a real nostalgic thing," says Wilson of being in the studio again. "That's where we did 'Surfer Girl,' 'Surfin' USA,' 'Little Deuce Coupe,' 'California Girls,' 'Good Vibrations'...a whole bunch of them."

"Bittersweet" is how Joe Thomas describes Wilson's return to the old Western room, which brought back memories of Brian's recently deceased brother, Carl, the Beach Boys' lead guitarist. "Brian walked into the room where they recorded 'California Girls' and he said, 'I remember we put Carl's Rickenbacker directly into the console. And he stood right here and played.' And then Brian got kinda misty. Tears kind of came to his eyes and he said, 'You know, this is a little bit heavy for me.'"

Brian sings all of his vocal parts himself, now that his brothers are gone (Beach Boys drummer Dennis Wilson died in 1983) and his relationships with surviving Beach Boys Mike Love and Al Jardine are somewhat distant. Quite a bit of effort goes into Wilson's trademark vocal harmony style. "I overdub each [vocal] line four times," Brian discloses. "Four notes per line. So on a five-part harmony, that's 20 notes. A small choir, right? Just a nice, pretty sound."

But with Wilson's gift for elaborate contrapuncta arrangements, some songs involved far more than 20 vocal tracks. "The one with the most vocal tracks would probably be 'Cry,'" says Thomas. "That one probably approaches 50 or 60 vocal parts, with that stacked chorus in the middle of the song. The amazing thing is that all these vocal parts are within about an octave

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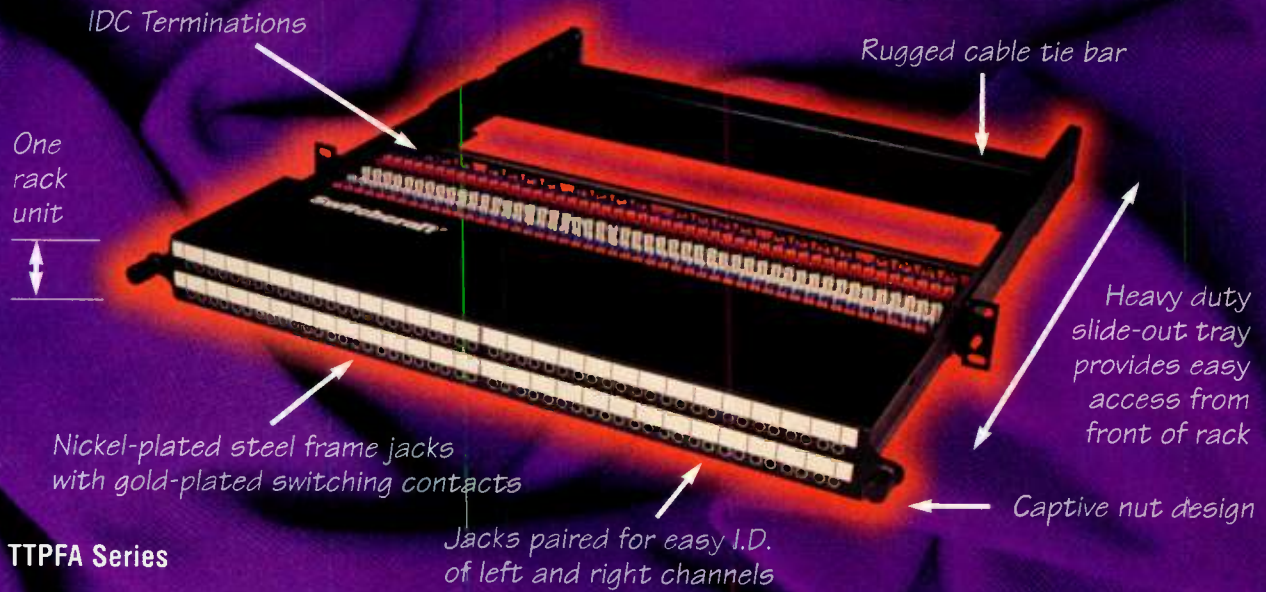
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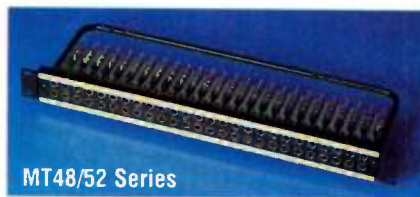
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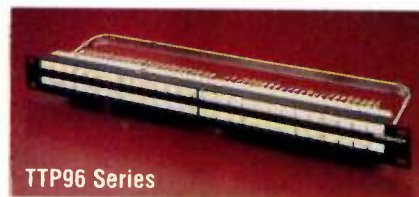
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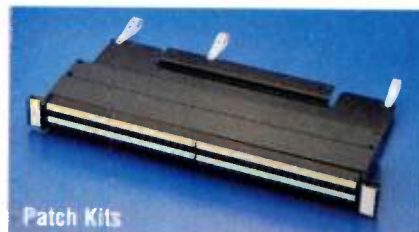
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In My Room

and a half of each other. There are a lot of voices that are only one note apart. So it's very clustered sounding. Very symphonic."

And very labor intensive — especially for the guy singing all those parts himself. But, at times, Pro Tools came to Wilson's aid. Pappalardo recalls, "At certain times, we'd fly choruses in because you figure the guy's going out there and singing all parts. He's multing them four times. After a while, he's going to get tired. We couldn't fly in all of Brian's choruses because of all his key modulations. In almost every song, by the time you get to the last chorus, it's a half step or whole step up from where it started. That's a big part of

Brian's style. How many other guys you know who modulate in an intro? But the way Brian does it, it never sounds tricky or contrived."

"Brian does everything backwards!" Thomas marvels. "He records his harmonies from the top down. If you have a C9 chord, imagine hearing the D first. You're saying 'Where's this going?' Because the next note would be the B flat below the D. You're saying, 'I can't get this.' But when he puts the tonic in, or one of the more common tones like the third or the fifth, it's like, 'Wow, this is amazing.' It was just pure joy to watch him work. Because he does things in such an obscure way. I could see where people in the '60s were getting a little uptight in the studio wondering where the

hell he was going with *Pet Sounds* and records like that. That's kind of how this was a couple of times.

"Another thing I discovered is that Brian still writes vocal parts as if the Beach Boys were going to sing them. He'll be sitting there going, 'Okay, this is Mike's part, this is Al's part, and this is Carl's part.' It's just kind of a subliminal; he still has their voices in mind. He actually sings the parts like the guys would have. On bass vocals, you'd sometimes wonder why Brian was singing them the way he was. He'd put a whole lot of resonance into those *baaomm ba bom baaomm* parts, because he'd be thinking ahead of how much reverb he wanted to put on, and how that res-

onance would hit the chamber or plate. And that's what creates that vocal sound. At first I'd be going, 'Brian, don't you think you're overdoing the resonance a little?' But I quickly realized, 'Hey, you're working with one of the greatest producers of all time. Just shut up, listen, and learn.'"

"We did all Brian's vocals on a C12," says Frank Pappalardo. "The mic pre was a Mic-PreEminence made by Studio Technology. We used an LA2A compressor/limiter on almost every vocal. We cut all the basic tracks with Neve modules: either 1082 or 8068 modules. For reverb, one thing we used was a TC Electronic M5000. We had all the usual stuff: an AMS delay, TC Electronic delay, two Lexicon PCM 42's, a Lexicon 480 L, an EMT Gold Plate, and a lot of different compressors: two UREI 1176's and two dbx 160's."

Another important source of reverb on the disc was the venerable old Ocean Way chamber, which still sounds very much the way it did when it belonged to Western and was used on all those Beach Boys classics. Wilson and his crew discovered a new project studio amenity: sending out for reverb.

"It started when we booked a percussion session at Ocean Way," Thomas recalls. "We were so fond of the reverb there that Brian said, 'Why can't we use this on everything?' Then we started figuring out how to do it and we started shipping tracks back and forth between Ocean Way and our studio."

"We always sent out the snare and the sidestick," Frank Pappalardo elaborates. "We'd pick one vocal harmony part — usually a high part — and always Brian's lead vocal and send that. And then we'd send maybe one other thing, like a guitar or a percussion part. I'd ship them off to John Lawson at Ocean Way and he'd just go into the studio there, send the tracks into the chamber, print it on tape, and send it all back. And I'd just bring up the reverb tracks on faders, like an effects return. As soon as you did that, it sounded like the old Beach Boys stuff. You just can't get the sound of that old Ocean Way chamber out of any digital reverb. Sometimes that worked and sometimes it didn't. The decay time from the Ocean Way chamber was just too long in some cases. But I don't think there's a song on the album that doesn't have it."



HIS OWN STYLE: According to co-producer Joe Thomas, Wilson does everything backward, such as recording harmonies from the top down.

I JUST WASN'T MADE FOR THESE TIMES

By Alan di Perna

Brian Wilson did not always receive kindness from the two men he considers his mentors: his dad and Phil Spector. Murray Wilson — father and manager of Beach Boys siblings Brian, Dennis, and Carl — was a demanding and somewhat tyrannical figure who drove his boys hard, requiring perfection of them on stage and in the studio. He once dealt Brian a blow to the head that left him deaf in his right ear. And Phil Spector once had an adoring young Brian in to play piano on a session, only to eject him from the studio shortly after the date got underway, telling him he just wasn't cutting it.

Life has not been easy for Brian Wilson. The sunny, care-free sound of the Beach Boys was, paradoxically, born of much anguish. In 1964, two years into the Beach Boys' success, Wilson suffered his first nervous breakdown on an airplane at the outset of a Beach Boys tour. Afterwards, he announced to the band that he could no longer go on the road, and that henceforward he would stay in L.A., where he'd write and record the Beach Boys' music while the other group members toured with a substitute bassist/vocalist.

Brian began working with members of Phil Spector's studio band, the Wrecking Crew, which was comprised of first-call session aces like drummer Hal Blaine, bassist Carol Kaye, guitarist Ray Polman, and keyboardist Larry Knechtel. They cut at the old Western Recorders and even Spector's own haunt, Gold Star. In breaks between touring, the Beach Boys would lay their vocals onto the music Brian had recorded. It was an unprecedented arrangement to say the least. But it produced some of the Beach Boys' most enduring work, including singles like "Help Me Rhonda," "California Girls," "Wouldn't It Be Nice," "Sloop John B," "Good Vibrations," "Heroes and Villains," and the landmark *Pet Sounds* album.

But as the '70s kicked in, Wilson sank deeper and deeper into drug use, depression, paranoia, and reclusiveness. He re-emerged in the '80s under the care of the infamous Dr. Eugene Landy, another authoritarian figure who kept strict control over every aspect of Brian's life, even demanding co-credit for his music. Many close to Brian felt he'd traded one form of dependency for another.

But all that is behind Wilson today. Recently remarried and with two adopted daughters, he's leading a healthy and sane life, dividing his time between homes in Beverly Hills and St. Charles, Illinois. Wilson's hipness quotient is at an all-time high now. A whole new school of alternative rock bands, spearheaded by the High Llamas and Sean Lennon, have taken *Pet Sounds* as their Bible. Meanwhile, Brian's latest record, *Imagination*, is his strongest in years.

Wilson's troubles have left him obviously damaged. He is subject to nervous ticks, twitches, and bouts of stuttering. Much of what he says has a childlike simplicity and honesty that sometimes seems the product of feeble-mindedness and at other times seems to possess a mysterious Zen kind of wisdom. But whatever part of the hu-

man psyche it is that produces music is gloriously intact somewhere inside Brian Wilson. One listen to *Imagination* makes that clear. Through all his trials, he's hung on to his soul.

EQ: You once said — and I believe you were talking about *Pet Sounds* — that you wanted to find sounds that would make people feel loved. Is that still your goal?

Brian Wilson: Well sure. I think the *Imagination* album attempts to recapture some of the loving spirit of *Pet Sounds*. I think it's still around, in some ways. Although it's a passe album by now. It may not be a very current type of thing, but it definitely holds its own and speaks its piece.

I think *Imagination* reflects what I've been through in the years since *Pet Sounds*, and also shows where I'm at now. **You've come through a rough time.**

Yeah. People in this business all go through it. The whole idea of competition, or whatever you want to call it, really burns holes in your brain. Strange trips occur. First of all, you worry, "What am I supposed to do here? What am I going to do with all that I feel with my brain and my soul?" It's almost impossible to figure out. Then one day you're sitting at the piano and it comes to you in a flash: "Hey, I think we got something here!" But then it dies off again, a little bit. Then it'll be, "Ah, fuck the piano!" That might last like two weeks: "Screw the business!" Then, a month later, it's my bread and butter again. Sometimes I get very upset. I get fearful, too. But that's all right because I figured out that if you can be really scared and still get through one day, then you can do it the next day and the next day. You build credentials. You say, "What am I gonna do? I don't know, but I have my credentials. I've done it in the past. I can do it again."

How did you first get interested in record production?

In 1962 [when Wilson recorded the Beach Boys' first hit, "Surfin'" at the Wilson family home in Hawthorne, CA.] I was just trying to reach Phil Spector's records, you know? Not the sound exactly, but the technique and his ideas of production. Using one instrument, then another to make a third sound: a piano and a guitar mixed together to make a sparkling sound. I've tried to do that throughout my career. And bring his message to the world. It would almost be like a lord to a son.

What was it like shifting gears from recording with the Beach Boys to recording with the Wrecking Crew?

It was a thrill. Anybody who worked with Phil Spector had to be the best, right? So I knew I had the best musicians I could ever have. And I was real thankful that I could work with such great musicians.

You were kind of a younger guy...

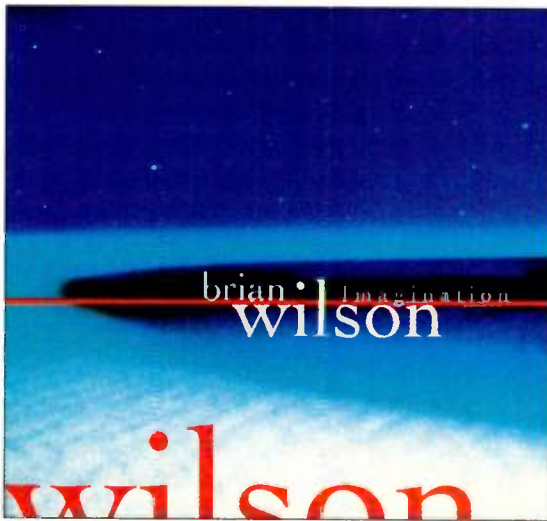
Young and energetic and ambitious: "Okay guys, let's make a Number One record!" Now I go [weary voice],

continued on page 159

In My Room

"It was a real revelation to see how Brian processes vocal harmonies," says Thomas. "I always imagined that the most reverb would be put on the higher harmonies. But in mixing it, Brian would put more reverb on the lower parts. Frank and I also learned that the middle and lower vocals in Brian's arrangements are mixed way louder than you'd think. The natural tendency is to bring out those high falsetto parts. But Brian would constantly be shoving our hands back, saying, 'No, no. That's not the way to do it.' Until you get the right blend between the low and the highs, it doesn't sound quite like it should. Brian is the master of that."

Wilson's studio proved more than adequate for both vocal and instrumental tracking needs. "Although we're calling it a project studio, it's not small by any means," says Pappalardo. "We've got two decent-sized recording rooms. And there's a mic input panel in every room down here, even the lounges. So I never need-



USING HIS IMAGINATION. Wilson's latest release

ed extra rooms or more isolation. For the most part, except for basic tracks, there was never more than three people playing at the same time. A lot of times, Brian and Joe were doing head charts. And they prefer to work with one guy at a time and just hum stuff and make him play it."

"On 'She Says That She Needs Me,' each of the reed and string parts was tracked separately," adds Thomas. "We didn't have a section. We basically had one guy playing. Paul Mertens did all the reed parts individually, and Larry Franklin did all the string parts individually. So we probably accumulated 40 to 50 tracks doing that. And then the vocals probably took another 40 tracks. We were doing submixes, and Frank and I did the math. We figured we had 104 open tracks and we probably did two or three submixes, so

that could be in the range of 120 tracks. That was the first song where I was exposed to the kind of submixing Brian does. A couple of nights, I'd go home with the rough mixes and think, 'God, we're stuck with that bouncedown. How can we fix it?' But Brian really calmed me down. He said, 'Wait till you hear the whole arrangement. It's gonna be fine.' In the early days, when he was working on 4- and 8-track, he'd have to do a lot of submixing. Sometimes, quite frankly, something would be a little too loud. But that would become the sound of that record. All the Beach Boys records have a frantic, spontaneous kind of energy to them. Things pop out at you once in a while, and that's why. So we learned to worry about

bounce-downs a lot less. And maybe that's why this record doesn't sound like a lot of other records that are out there now. Everyone says, 'Gee, it sounds like a Beach Boys record.' Well, duh. Why wouldn't it?" "This album would have been

tough to make without the computer," says Pappalardo. "With so many alternate takes and different versions of songs, we'd store things in Pro Tools if we ran out of tracks. That gave us quite a bit of freedom in editing different things together, too. It was really a '90s version of Brian's recording techniques. He was totally into the computer."

All told, the *Imagination* sessions were a major learning experience for Thomas, Pappalardo, and everyone else involved. "I swear to God, Brian sang the verses to 'Imagination' on the day of the mix," Pappalardo marvels. "He made up totally new parts while I was mixing it. He said, 'You know what? I've got an idea.' He went out there and I'd say he improved the verses 90 percent. There was no such thing as recording mode and mix mode on this record. You always had to be ready to do anything." **EQ**

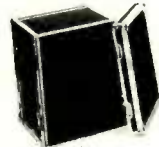
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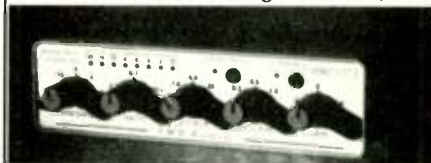
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1999 PRODUCT PREVIEW

It's Christmas for engineers once again. Of course, we're talking about the AES Convention, where all the latest gadgets and technologies make their appearance to tantalize our minds and empty our wallets. To keep you up to speed on all that's coming, we present our annual preview of new studio equipment to look for in the upcoming year.



UR IN CONTROL

Tellex Communications introduces the UR-700 UHF wireless microphone system. The UR-700 receiver and associated transmitters, the HT-700 and WT-700, offer the signal confidence of operating as a full diversity system in the 690-to-725 MHz UHF range. Up to 10 systems can be used

simultaneously, using specific preset frequencies, depending on local conditions. The UR-700 features Telex's patented Posi Phase auto diversity circuit, which allows the unit to use both antennas at all times, resulting in stronger signal reception from the transmitter. The system's transmitter has a power of 10 mW and offers an array of dynamic and electret elements. For more information, contact Telex, 9600 Aldrich Avenue South, Minneapolis, MN 55420. Tel: 612-884-4051. Circle EQ free lit. #101.

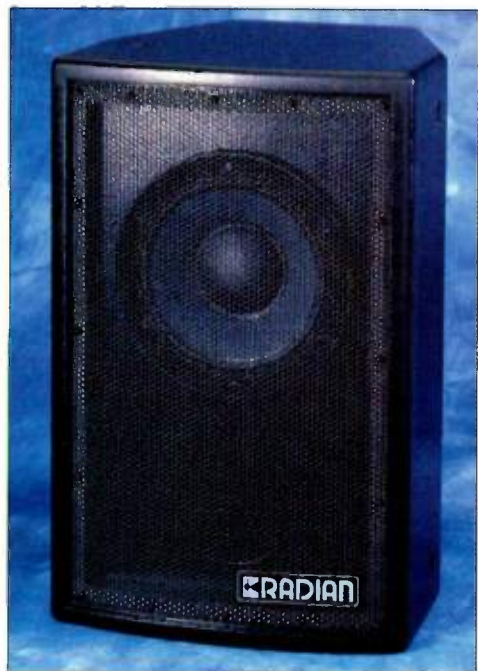
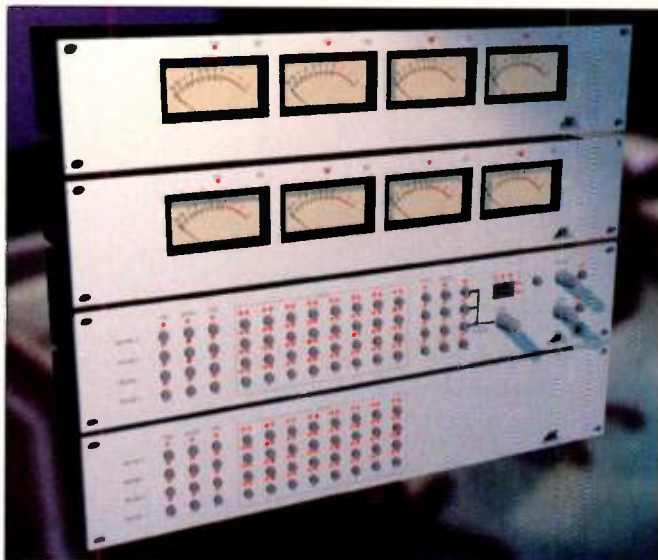
EASY EDIT

SADiE announces its new digital audio workstation, the SADiE 24•96. The 24•96 is designed for any audio editing application, including film, TV postproduction, CD/DDP mastering, music editing, education, and multimedia. Based on the Windows 95/98 platform, the SADiE 24•96 PCI cards are controlled by the SADiE software. Each card is equipped with eight inputs and eight outputs and can replay 24 tracks of edited 16-bit audio. Twenty-bit analog conversion is built into the system and external converters are provided for by AES/EBU digital I/O on every channel. The price is \$9995. For more information, contact SADiE, Inc., 1808 West End Avenue, Suite 1119, Nashville, TN 37203. Tel: 615-327-1140. Circle EQ free lit. #102.



TRACK WATCHER

Martinsound introduces the Recorder Monitor System (RMS), which is a modular, rack-mounting, multi-input monitor and switching matrix that provides the machine room technician with programmable alignment, monitoring, metering, and track-combining facilities. The system is based around the Primary Control Unit, a 2U module accommodating four 8-track recorder inputs. Three additional 2U expander units may be added to provide facilities for up to 128 tracks. Communication by serial control protocol permits distributed placement of the units and allows the use of a roving remote control panel. Some of the RMS's capabilities include monitoring track combining for copies and transfers, QC monitoring of multiple format masters, and projector change-over switching. The price is \$6200. For more information, contact Martinsound, Inc., 1151 West Valley Boulevard, Alhambra, CA 91803-2493. Tel: 626-281-3555. Web: www.martinsound.com. Circle EQ free lit. #103.



8 (INCHES) IS ENOUGH

Radian Audio Engineering introduces its new 8-inch coaxial loudspeaker system. The portable version, the RPX-108PV, is an 8-inch, two-way trapezoidal system rated at 400 watts continuous program and is constructed of 13-ply Baltic birch. It includes a pole cup on the bottom of the enclosure for stand mounting, a handle, and the company's proprietary Duradian cabinet finish. The permanent installation version, the RCX-108PV, comes without the handle and pole cup and has a black texture-painted finish with 12 pre-installed ATM flypoints. For more information, contact Radian Audio Engineering, 600 N. Batavia, Orange, CA 92868. Tel: 714-288-8900. Circle EQ free lit. #104.

BE ON THE LIST

Digidesign has released version 2.1 of MasterList CD, their popular CD mastering software program, which produces Red Book standard CD-DA masters. Version 2.1 adds support for two new CD recorders, the Sony CDU 948S/X and Yamaha CDRW4260, increasing the list of recommended recorders to 22 different models. MasterList CD version 2.1 now supports optional use of any PCI-based Digidesign hardware system for high-resolution output monitoring and digital transfers to DAT, including Pro Tools III and Pro Tools Project II, in addition to Pro Tools24 and Audiomedia. The suggested retail price is \$495. For more information, contact Digidesign, 3401 A Hillview Ave., Palo Alto, CA 94304. Tel: 650-842-7900. Web: www.digidesign.com. Circle EQ free lit. #105.

QUAD-ZILLA

The Quad 4 is the latest multieffects processor to join the DigiTech Studio family. The equivalent of four separate processors in one, this 4-in/4-out processor features a large amount of flexibility in an affordable package. From its 20-bit A/D and D/A converters to increased performance capabilities, the Quad 4 is designed for any studio or live environment. The Quad 4's S-DISC II processing provides a library of award-winning effects including Compression, Rotary Speaker Simulator, Spring Reverb, Vocoder, Time Warp, Envelope Filter, and much more. The suggested price is \$479.95. For more information, contact DigiTech Studio, 8760 South Sandy Parkway, Sandy, UT 84070. Tel: 801-566-8800. Circle EQ free lit. #106.





UPGRADE ALERT

Syntrillium announces the release of the Cool Edit Pro 1.1 Upgrade Version. This new release is designed to upgrade users from OEM versions of Cool Edit Pro (SE and LE) bundled with sound cards and other hardware and software packages. These include Darla, Gina, and Layla lines of sound cards from Event Electronics, the Logic Audio Platinum package from Emagic, and others. Before this release, users could only upgrade through Syntrillium Software. Now they can get the Upgrade Version from their local music store or other software or hardware dealer. The program itself is a digital audio editor, recorder, and mixer application for Windows 95 and Windows NT. The price for the Upgrade Version is \$249. For more information, contact Syntrillium Software Corp., P.O. Box 62255, Phoenix, AZ 85082-2255. Tel: 602-941-4327. Web: www.syntrillium.com. Circle EQ free lit. #107.



A NEW LOOK AT A CLASSIC

Westlake Audio presents a redesigned version of the classic BBSM-5 nearfield monitor system. The BBSM-5 is a medium-power, two-way, low-distortion professional reference monitor. The unit offers an internal, high-level, passive crossover that al-

lows the option of either biamp or biwire connectivity. The redesign includes a slightly reproporioned, bass-reflex cabinet using a single optimized port and the exclusive Westlake ISO-back mounting system for shock absorption. The one-inch dome tweeter employs a double magnet system that works in conjunction with the dual five-inch drivers to reduce the stray magnetic field. For more information, contact Westlake Audio, 2696 Lavery Court, Unit 18, Newbury Park, CA 91320. Tel: 805-499-3686. Web: www.westlakeaudio.com. Circle EQ free lit. #108.

KEEP IT CLEAN

Summit Audio's TMX-420 4x2 line level mixer offers vacuum tube sound quality coupled with expandability. The mixer is designed for situations where a particularly clean sounding mix is desired, without passing the signal through a huge



mixing board. The unit is a hybrid vacuum tube/solid-state device offering A/B pan control and channel input level control. The design includes a per-channel in/out switch, phase switch, and send level control with a pre- or post-level switch. The TMX-420 is capable of linking up to four units together, creating a 16-channel mixer. For more information, contact Summit Audio, Inc., P.O. Box 223306, Carmel, CA 93922. Tel: 408-464-2448. Web: www.summitaudio.com. Circle EQ free lit. #109.



DAT'S DA TICKET

TASCAM's DA-45HR is a high resolution, 24-bit DAT recorder. It allows you to record true 24-bit audio data on a standard DAT tape. The 3U rack-mountable unit features XLR balanced and RCA unbalanced analog I/O, AES/EBU and S/PDIF digital I/O, word sync I/O and a parallel interface. The DA-45HR's menu-driven environment features an easy-to-read display with easy access to its numerous system parameters, including AUTO ID, COPY ID Select,

Reference Level, RECOrd Mute, and Repeat. The unit has two recording modes. For more information, contact TASCAM, 7733 Telegraph Road, Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #110.

THE EQUALIZER

As part of their Intermix series of recording equipment, Malcolm Toft Associates (MTA) has created the Intermix 16-channel, 4-band equalizer. This 4U rack unit provides 16 independent channels of high-quality equalization with balanced inputs and outputs. The circuitry used in the 16-channel equalizer is the same as in MTA's large studio consoles. The overlapping frequency ranges are as follows: 40 Hz-650 Hz, 150 Hz-2 kHz, 700 Hz-10 kHz, 1 kHz-15 kHz. Each channel is also fitted with an illuminated bypass switch. The unit features the ability to link with any other Intermix product, which includes a control unit, a mic/line amplifier, a routing and panning device, and many others. For more information, contact MTA America, 302 South Main St., Albion, NY 14411. Tel: 716-589-2100. Web: Toft.co.uk. Circle EQ free lit. # 151.

PASS THE MIC

The CX-101 from Audix is a true large-capsule condenser microphone with a one-inch gold vapor diaphragm and a very low noise floor of 17 dB(A), making it one of the most quiet condensers on the market. It features a rugged brass housing and the Audix trademark black satin finish. Operation requires a phantom supply of 48-to-52 volts. In addition to recording vocals,

acoustic instruments, woodwinds, and reeds, the CX-101 is also ideal for certain live applications that require the transparency that only a large-capsule condenser delivers. The price is \$499. For more information, contact Audix, 9400 SW Barber Street, P.O.Box 4010, Wilsonville, OR 97070. Tel: 503-682-6933. Circle EQ free lit. #111.



WHAT'S YOUR Q

Sabine introduces a whole new line of digital signal processors incorporating their patented FBX automatic feedback



control technology. The GRAPHI-Q is an all-digital EQ, FBX Compressor, and delay in one package. The new 24-bit unit is available in four models. All the GRAPHI-Qs can be controlled via computer — and you get complete analog-style controls for functions on the standard GRAPHI-Q. It also includes an internal Flash RAM, so you can upgrade from Sabine's Web site with the touch of a button. Other features include 32-bit floating-point processing, 31-band graphic EQ with switchable boost/cut of either 6 or 12 dB, and Sabine's patented CLIPGUARD Adaptive Clip Level Control. For more information, contact Sabine, Inc., 13301 Highway 441, Alchua, FL 32615-8544. Tel: 904-418-2000. Circle EQ free lit. # 152.

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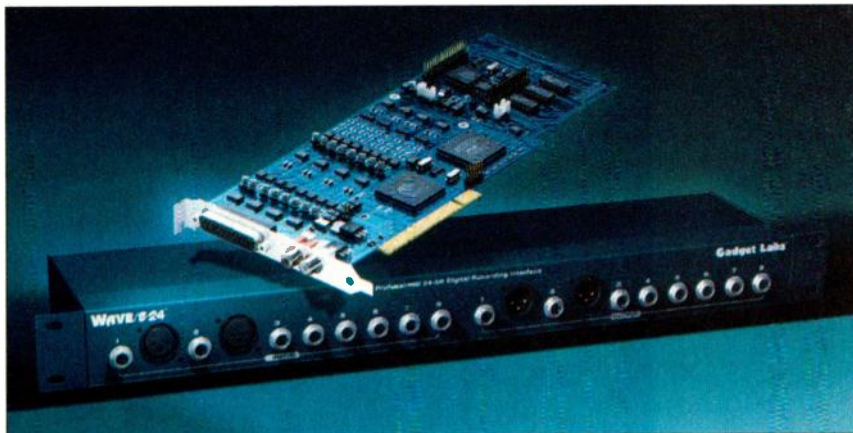
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CHOICE WIRELESS

Samson introduces the VHF (non-diversity) and VHFTD (diversity) Series wireless microphone systems. The systems' receivers, VR3TD (diversity) and VR3 (non-diversity), feature Samson's high-speed Microprocessor True Diversity Circuitry that scans incoming signals 200,000 times a second. For more information, contact Samson Technologies Corp., P.O. Box 9031, Syosset, NY 11791-9031. Tel: 516-364-2244. Circle EQ free lit. #113.



INSPECT A GADGET

Gadget Labs introduces The Wave/8*24 digital recording interface. The Wave/8*24 offers a relatively inexpensive way to record multiple channels with professional 24-bit resolution. The unit includes support for balanced audio connections, +4 dBu signal levels, MIDI, and true 24-bit samples. The Wave/8*24 comes with a PCI adapter card and an external connection bay. The patch-bay integrates easily into studio environments, with front access analog audio jacks that connect to nearly all types of professional and consumer audio equipment.

Users can also expand to 16 or 24 analog channels by installing multiple Wave/8*24 interfaces in a PC. The suggested retail price is \$499. For more information, contact Gadget Labs, 333 SW 5th Avenue, Suite 202, Portland, OR 97204. Tel: 503-827-7371. Web: www.gadgetlabs.com. Circle EQ free lit. #114.

MAKE YOUR SYNTHESIZER WISER

EMU-ENSONIQ announces the debut of Version 2.0 software for the Audity 2000 synthesizer. This software release doubles the polyphony of the Audity 2000 from 32 voices to 64 voices and adds the ability to download new features and presets over the Internet. EMU-ENSONIQ is offering this software free-of-charge if you purchase Audity 2000 between April 15 and October 31, 1998. Otherwise, the price is \$199. For more information, contact EMU-ENSONIQ, 1600 Green Hills Road, P.O. Box 660015, Scotts Valley, CA 95067-0015. Tel: 831-438-1921. Circle EQ free lit. #115.

PORTABLE GRACE

Grace Design presents the Lunatec V2 mic preamp line. Features include 6-12 V DC power, gain range of 10-60 dB with rotary switch controls, 48 V phantom power, two-position high-pass filter with 6- or 12-dB/octave slope, and MS decoding. For more information, contact Grace Design, P.O. Box 204, Boulder, CO 80306-0204. Tel: 303-443-7454. Web: www.gracedesign.com. Circle EQ free lit. #116.

BE CONVERTED

Benchmark's AD2408-96 is an 8-channel audio A-to-D converter. This converter system provides word lengths of up to 24-bit and sample rates up to 96 kHz. When operating in either the 16- or 20-bit modes, the converter provides selectable TPDF or two choices of noise-shaped redithering. The AD2408-96 has sample rates of 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, and Varispeed. Eight 9-segment, true-digital meters provide a coarse scale for signal presence monitoring and a fine scale for precise level monitoring near Full-Scale-Digital. The unit has an international power supply and is housed in a heavy-gauge, RF-tight chassis. For more information, contact Benchmark Media Systems, Inc., 5925 Court Street Road, Syracuse, NY 13206-1707. Tel: 800-262-4675. Circle EQ free lit. #117.





AM WAY

GT Electronics' AM61 large diaphragm, true condenser tube microphone combines an extra-large, hand-tooled capsule that protects its super-thin, gold-evaporated diaphragm. The AM61 provides a fixed cardioid polar pattern, a 10 dB attenuation switch, and a low-frequency roll-off selector. Its high volume handling (150 SPL) makes it an excellent choice for nearly any recording application. The AM61 includes its own power supply, hard-shell case, cable shock mount, and mic clip. The suggested retail price is \$999. For more information, contact GT Electronics, a Division of Alesis, 1633 26th Street, Santa Monica, CA 90404. Tel: 800-525-3747. Web: www.gtelectronics.com. Circle EQ free lit. #112.

BEST OF BOTH WORLDS

Using the advantages of both European design and Asian technology, ADK has designed the A-51 series large diaphragm condenser microphones. The A-51 series one-inch, gold-sputtered microphones provide warmth and vintage sonic quality. The mics have a 75 Hz Bass Roll-off switch and a 10 dB pad. The suggested retail price for the series starts at \$349. For more information, contact ADK DeutchKraft, Inc., P.O. Box 82282, Portland, OR 97282-0282. Tel: 503-772-3007. Circle EQ free lit. #153.



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DEEP RED

The D10B-D and Q10B-D bass cabinet are the newest additions to Bag End Loudspeakers' popular Deep Red series of bass cabinets. The D10B-D and Q10B-D do not contain a tweeter, therefore no crossover is required. These speakers are housed in an 18-inch deep cabinet. The D10 is loaded with a pair of 10-inch woofers, while the Q10 features a pair of 10-inch cones. The suggested prices are \$670 (D10B-D) and \$930 (Q10B-D). For more information, contact BAG END, P.O. Box 488, Barrington, IL 60011. Tel: 847-382-4550. Web: www.bagend.com. Circle EQ free lit. #118.



LIMITED EDITION GOLD

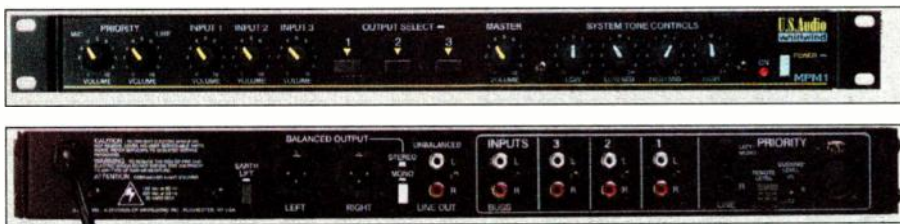
To celebrate its 70th anniversary, Neumann introduces a limited edition version of their benchmark U87 microphone, the U87 Gold. The U87 was originally introduced in 1967 as the first multipattern, large-diaphragm, solid-state microphone. The U87 Gold will



be available in two versions: a single microphone with matching gold-plated elastic suspension, and a stereo set including two U87 Gold mics and matching suspensions. These mics are designed for studio applications and classic microphone collections alike. The single microphone will retail for \$4000; the stereo set, \$8000. Only 100 units will be available. For more information, contact Neumann, 6 Vista Drive, P.O. Box 987, Old Lyme, CT 06371. Tel: 860-434-5220. Web: www.neumannusa.com. Circle EQ free lit. #119.

GROUNDBREAKING MIXER

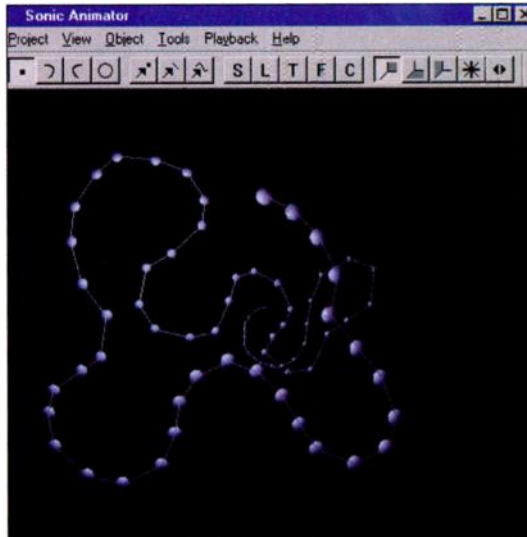
Whirlwind introduces the MPM-1 multipriority mixer for background music systems. The MPM-1 accepts multiple audio sources and provides voiceover muting. The mixer features three program stereo inputs, a stereo priority input, and a microphone priority input. Front-panel switches select which program input is to be sent to the outputs. The stereo

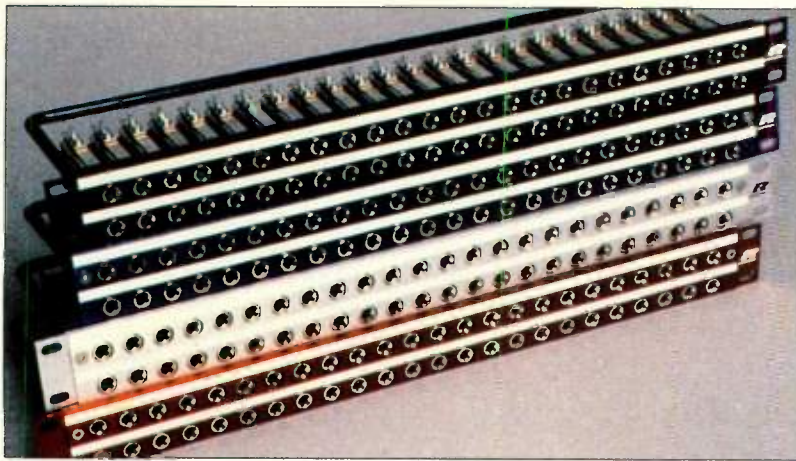


priority input takes priority over the program inputs when activated (for use with jukebox feeds, etc.). The mic priority input takes priority over all program material. For more information, contact Whirlwind, 99 Ling Road, Rochester, NY 14612. Tel: 888-733-4396. Circle EQ free lit. #120.

INSTANT SURROUND

Lake DSP's new Audio Display Tools (ADT) software is designed for production of truly three-dimensional audio performances for large audiences over multichannel speaker systems. From the delicate patter of light tropical rain to the pin-point localization of voices and musical instruments, the ADT system delivers a surround sound experience. The system features an easy-to-use graphic 3D representation of the trajectories of up to 32 independent sound sources as they move around the audience. Designers enter the locations of the speakers, and the software automatically creates the correct mix. For more details, contact Lake DSP North America, 6255 W. Sunset Boulevard, Suite 2000, Hollywood, CA 90028. Tel: 213-993-4468. Circle EQ free lit. #121.





HAPPY BAYS

Re'an's 1/4-inch LF (Long Frame) Series patchbays feature 48 or 52 jacks and are available in four colors to provide high aesthetics, a clean finish, and instant color-coded verification. The LF series patchbays are mounted in a heavy-duty, machined aluminum extrusion that delivers complete rigidity for maximum performance. In addition, each unit incorporates a unique strain relief bar on its back to help preserve solder joints. To compliment the LF Series patchbays, Re'an also introduces a series of military-style 1/4-inch Patch Chords. For more information, contact Re'an USA, Inc., Building No. 9, 16 Passaic Avenue, Fairfield, NJ 07004. Tel: 800-828-7266. Circle EQ free lit. #122.

GIVE EM WHAT THEY WANT

Sennheiser introduces the EM3532 2-channel, computer-controllable, true-diversity UHF wireless microphone receiver. A high level of operational reliability, menu-assisted operation, and solid mechanical stability make the EM3532 ideal for demanding multichannel applications, including sound reinforcement, broadcast, and theater. For more information, contact Sennheiser, 6 Vista Drive, P.O. Box 987, Old Lyme, CT 06371. Tel: 860-434-9190. Web: www.sennheiserusa.com. Circle EQ free lit. #123.



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For more information on the InBox or the unmatched Zefiro ZA2 soundcard with built-in sample rate conversion, call 949-551-5833 or visit our website at <http://www.zefiro.com>.





SUBS ON THE RUB

Community introduces the XLT54 horn-loaded subwoofer to complement their XLT Series of loudspeakers. This subwoofer is designed for portable sound reinforcement and DJ systems as well as fixed installations in music and dance clubs, theaters, performing arts centers, and other venues requiring extreme bass output. The XLT45's powerful output (in excess of 132 dB SPL), high-impact transient response, and solid bass projection make it particularly suitable for these applications. The subwoofer consists of four ferrofluid-cooled 15-inch drivers compression-loaded into two sealed compression chambers. The black-carpeted, wood enclosure comes with two 3-inch wheels for easy transport. For more information, contact Community Professional Loudspeakers, 333 East 5th Street, Chester, PA 19013-4511. Tel: 610-876-3400. Web: www.community.chester.pa.us. Circle EQ free lit. #124.

FORGING AHEAD



Sonic Foundry introduces the new 4.5 version of their Sound Forge product with expanded features and support for both Microsoft NetShow Services and Real Networks RealAudio/Video 5.0. The 4.5 version includes a built-in batch converter, a spectrum analyzer function, and a loop editing toolset with support for Sonic Foundry's ACID. Owners can upgrade from 4.0 for \$99, or from XP 4.5 for \$249. Otherwise, the retail price is \$499. For more information, contact Sonic Foundry, 100 South Baldwin Street, Suite 204, Madison, WI 53703. Tel: 608-256-3133. Web: www.sfoundry.com. Circle EQ free lit. #126.

ACOUSTIC SUNBURST

Auralex Acoustics' new Sunburst-360 is a stand-mounted, nearfield acoustical control device that absorbs sound from all sides. Manufactured from Auralex Studiofoam acoustic foam, the device is a 4-foot-tall column and can be positioned to achieve various mounting heights. The Sunburst-360 will work in any room and can be set up in arrays to create a permanent or portable acoustic environment around a performer or mixing area. For more information, contact Auralex Acoustics, Inc., 8851 North Hague Road, Indianapolis, IN 46256. Tel: 317-842-2600. Circle EQ free lit. #125.

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E-mu's sampler products set the standard for excellence in sound. Now you can put E-mu technology in your computer with the E-mu Audio Production Studio (APS)—the first sound card designed as an instrument, not a game card. And, like an iceberg, there's more to APS than meets the eye. APS is a PCI audio system that gives you **sampling**, 64-voice wave-table **synthesis**, multi-track **hard-disk recording**, and **real-time effects** in an easy-to-use, plug-and-play, music-making package.

APS allows you to create professional audio for sound design and multimedia content using your computer's RAM so you don't need to buy additional, proprietary memory.

APS lets you integrate up to 32MB of SoundFont® samples while playing stereo digital audio from your hard drive. SoundFonts are the most widely-used downloadable sample format. Thousands are available from E-mu, third party developers or on the Internet. You can even create your own with the Audio Production Studio.

E-Card—the heart of APS

The E-Card allows full duplex, 16-bit CD-quality streaming audio that can be augmented with programmable hardware-based real-time effects including reverb, chorus, echo/delay, compression and parametric EQ.

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APS includes E-Drive, an audio access panel that installs in the drive bay of your PC. It has switchable mic/line inputs, studio-quality preamps, balanced 1/4" connectors and switchable microphone types (with internally-selectable 12V phantom power). There's also an extra S/PDIF I/O and headphone output with volume control. E-mu's E-Control software for Windows® 95 lets you easily manage all of your mixing and routing tasks.

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APS is the future of digital audio. So whether you use APS as a standalone digital audio system or as an addition to your existing studio, APS's professional features will add new flexibility and fidelity to your creations—all for less than \$700.

To find out more about how the E-mu Audio Production Studio is just the tip of the iceberg, see E-mu's desktop music site at www.emu.com, or visit your local dealer.



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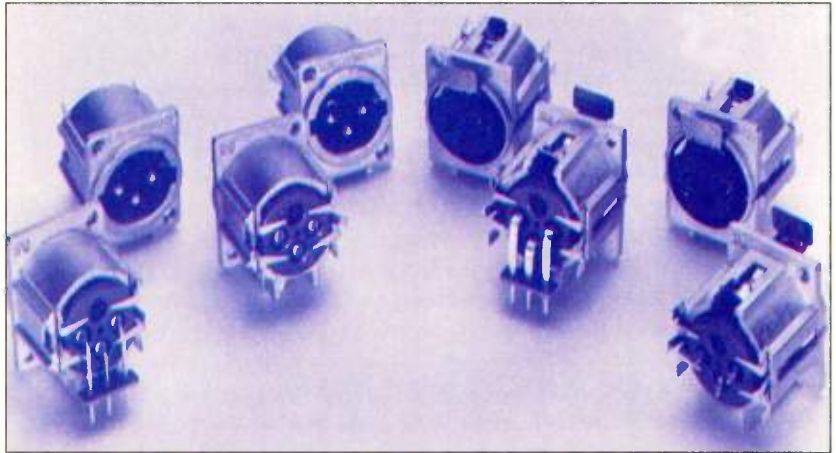
1999 PRODUCT PREVIEW

JACK OF ALL TRADES

NEUTRIK introduces the Hi-D 1/4-inch vertical stereo line jacks for PCB assembling. These jacks are designed for any application requiring a vertical PC-mount jack. Reliable and ruggedly-built, the jacks are small enough so several can fit into cramped spaces. For more details, contact NEUTRIK USA, 195 Lehigh Ave., Lakewood, NJ 08701. Tel: 732-901-9488. Fax: 732-901-9608. Web: www.neutrikusa.com. Circle EQ free lit. #128.

PLUG IN

Switchcraft now offers the F Series receptacles with ferrite disks. Available in male and female, the receptacles can be mounted from the rear of the panel. Features include an all-metal housing with a ferrite disk for added EMI/RMI shielding. Both male and female connectors can be mounted verti-



cal or horizontal to the PC board. All connectors have a PC board retention feature to hold the connectors firmly to the PC board prior to soldering. Other features include locking receptacles, silver-plated contacts, and through-the-shell ground connection. For more information, contact Switchcraft, Inc., 5555 North Elston Avenue, Chicago, IL 60630. Tel: 773-792-2700. Web: www.switchcraft.com. Circle EQ free lit. #129.

HAVE YOU HEARD...

Lawson (Tel: 615-269-5542) introduces the Shaman vacuum tube microphone preamplifier/direct box. The Shaman is a pure tube preamp that provides variable gain up to +55 dB and transformer-balanced output levels in excess of +26 dBm. The Shaman also provides a direct input to accommodate electric guitar, bass, keyboards, drum machines, etc...

Belden Wire & Cable Company (Tel: 765-983-5200) adds the 1172A Mid-sized Microphone Cable to its Brilliance family of audio and video cables. The 1172A is a four-conductor mic cable that reduces noise to the lowest possible levels. To further reduce noise and increase durability, the cable features Belden's patented French Braid Shield in which two copper spirals are tied together by one weave...

BGW Systems (Tel: 800-468-AMPS) introduces the TMC-2 Theater Crossover Card, which is to be used in conjunction with BGW Millennium Series power amplifiers. The TMC-2 mounts inside the Millennium amplifiers for two-way theater sound systems. Features include 500 Hz and 800 Hz switch selectable crossover, equalization for screen loss/x curve compensation, and a high-frequency attenuator...

Arboretum Systems (Tel: 650-738-4750) offers the real-time, live audio processing Hyperprism 2 effects software for Power Macintosh computers. The software features a real-time analog-style vocoder for classic funk, rap, and robotic vocal effects. Other Hyperprism modules include Frequency Shifter, Z-Morph "talk box" effect, soft-knee Compressor, Professional Limiter, Vari-Speed "tape-style" pitch shifter, and an updated Doppler effect. The software provides a virtual effects rack...

National Semiconductor (Tel: 408-721-5000) introduces the LM4835 audio power

amplifier for desktop and laptop computers. The amp generates 2 watts of power and incorporates a special suite of design features that includes stereo driver stages for speakers and headphones, internal DC volume control, bass boost, and docking station/line level outputs...

TecNec (Tel: 800-543-0909) presents ON THE LEVEL, audio interfaces that are designed to interface semi-pro, industrial, and consumer audio equipment such as cassette players, CDs, turntables, digital video discs, or similar unbalanced equipment...

The IQ P.I.P USP2 DSP module from **Crown** (Tel: 219-294-8208) features full 24-bit signal processing and load supervision. A major upgrade from the original P.I.P DSP module, the USP2 features an enhanced graphical user interface, which allows on-screen graphic editing of audio filters such as EQ and compression. The module also features eight adjustable filters per channel...

TASCAM (Tel: 213-726-0303) introduces the CD-450 compact disc player. Designed for sound contractors, broadcast facilities, and recording studios, this CD player features Auto Cue and Auto Ready functions, Call and End of Message (OEM) functions, Fader and Event Start capability, Incremental Play, and numeric keys for easy programming, plus all the connectors needed to interface with other equipment...

Weiss (Tel: +41-1-940-20-06) has developed the EQ1-DS MK2 software to work with their EQ1-DS double sampling equalizer. The version 4.0 software runs on a new SHARC-based DSP board that can be exchanged against the former DSP32C-based board. The EQ1-DS MK2 features a much higher parameter resolution than the EQ1 or the EQ1-DS. The center frequency, boost/cut, and Q

continued on page 86

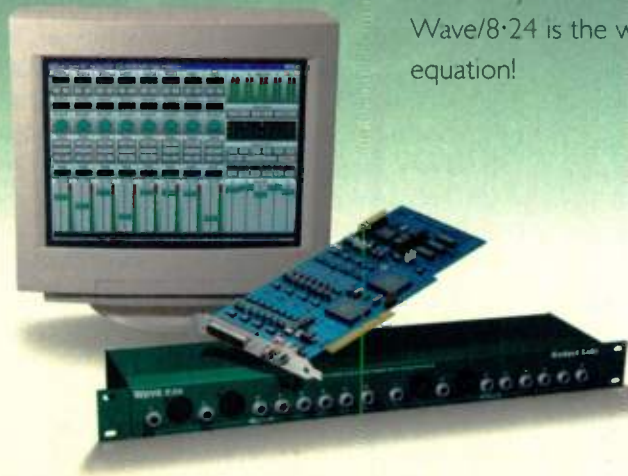
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FIRST LOOK IMPORTANT NEW PRODUCTS

Not that the other products are not important, but we've selected four new products that we think will have an impact on your professional life (maybe even your personal ones, but we won't get into that...). So check 'em out and let us know what you think.

Steinberg Cubase VST 4.0 for Macintosh

BY ROGER MAYCOCK

The evolution of the audio capable, computer-based MIDI sequencer is one of the most interesting developments to enhance studio productivity this decade.

When you consider that just a few short years ago, having a computer play a stereo pair of audio tracks side by side with one's MIDI tracks seemed nothing short of miraculous, the multitrack capabilities of today's programs truly represent a milestone technological achievement.

Steinberg's Cubase VST (Virtual Studio Technology) and its various configurations have been at the forefront of this development for quite some time. Its plugin architecture appears headed for industry-wide acceptance, and the company's cross-platform capability has done much to establish Cubase as a major player in

both the Mac and PC music camps. In recent years, the Mac and PC versions of the program have been very close in their overall level of functionality, with one version periodically nudging ahead of the other for brief periods.

Steinberg has just introduced Cubase VST Version 4.0 for the Macintosh PowerPC, and once again the company has upped the ante in this highly competitive segment of the music and recording market. Version 4.0 implements a considerable number of new features both in the audio and MIDI aspects of the program — but none perhaps more noteworthy than the top-of-the-line VST/24 version's ability to record up to 96 tracks of 24-bit audio at

a sampling frequency of 96 kHz.

Before going any further, let's get one thing straight: Cubase VST 4.0 needs a powerful computer. At an absolute minimum, Steinberg recommends a 120 MHz PowerPC with no less than 32 MB of RAM and Mac OS version 7.6.1 or later. To quote the company from its Web site (www.us.steinberg.net), "There is no maximum system requirement, but an Apple G3/300 MHz with 64 MB or more, would be very, very cool." Enough said.

For the purpose of this article, since MIDI sequencing is (like the program's audio counterpart) a record function, we'll look at some of the more notable MIDI and audio features incorporated into this latest version. All three versions



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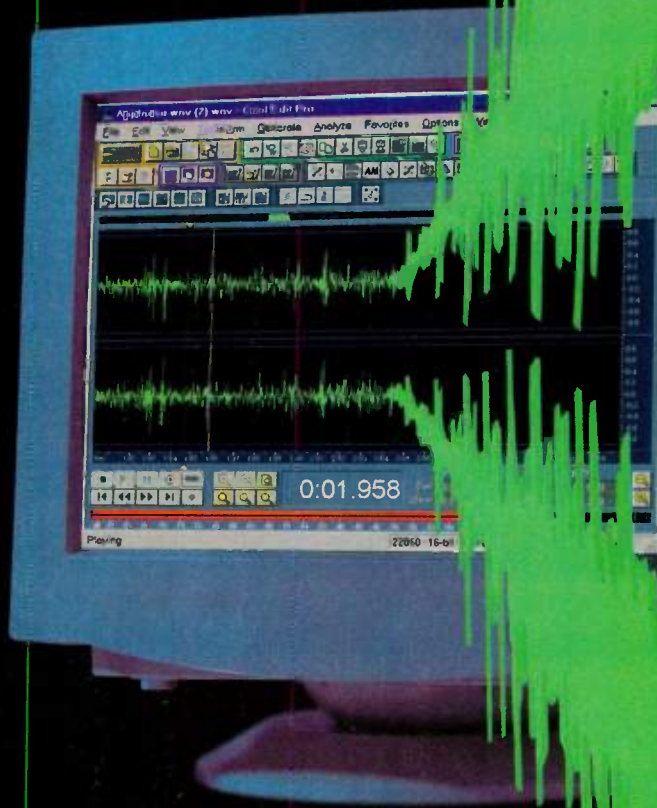
"Cool Edit provides all the tools - right out of the box - to get you from start to finish on most multitrack recording projects."
- Electronic Musician, August 1998

"Cool Edit Pro...continues to maintain Cool Edit's excellent price/performance ratio, and adds a few new twists."
- EQ, October 1998

"...this exceptional product is perfect for professionals in the music, broadcast, and multimedia development industries."
- ZD Net, May 1998

Look for Cool Edit Pro
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of Cubase share the features that follow, with Cubase VST/24 having the aforementioned audio capabilities plus facilities for 20- and 18-bit digital recording. Cubase VST and Cubase VST Score (which adds music scoring capability) are both 16-bit recording applications.

From an audio perspective, Version 4.0 provides an unlimited number of audio tracks (depending on your computer's resources) with the ability to playback upwards of 64 channels of audio. The system supports a 64-channel mixing console with 16 groups and 8 aux sends per channel. There's also an eight-space effects rack and an eight-space master effects rack. On any given channel, there can be as many as four insert effects, with an additional four insert effects in the mixer's group section. The mixer's EQ section has been beefed up with four new high-quality EQs per channel.

For audio editing, Version 4.0 provides a nondestructive audio clips editor and a direct waveform editor with tools. Audio can be time stretched and pitch shifted, and there is crossfade capability. Files can be exported to a variety of formats. Additional goodies include Audio Groove Quantize (enabling you to create quantization templates), Audio-to-Tempo Analysis, and Audio-to-Groove Analysis.

New MIDI features found in all versions of the program include new tools for part/track selection, pan, volume, and other common parameters, Folder Tracks (multiple tracks in a common folder), a MIDI track mixer with automation, and an enhanced clock resolution of 1920 PPQN (pulse per quarter note). There are new facilities for Part and Event handling, a system exclusive editor, full GS/XG/GM compatibility for multimedia/game development, and four arpeggiators. Version 4.0 also adds user-definable MIDI mixer objects and Groove Box for Quantize in order to create quantization templates.

Steinberg's Cubase VST 4.0 goes a long way toward helping us realize a fully integrated MIDI/Audio recording environment that can serve as the focal point of the stu-

dio. Particularly with MIDI data, the program has exceptional real-time editing control — enabling you to modify track data, mixer data, or even save or load files while the music is playing. Its mixer screens respond very smoothly, accept control from external devices, and can be customized extensively. Cubase also has excellent provisions for controlling external hardware such as digital multitracks and countless other recording devices.

Perhaps one of the most valuable aspects of using Cubase is the fact that if you understand the program at all, you'll be able to work in any studio, on either a Mac or a PC, and never have to struggle with an unfamiliar sequencer program ever again. Both the Mac and PC versions look and behave the same with few exceptions. As is the case with any of today's powerful audio/MIDI sequencers, the learning curve can be a time-consuming adventure. But if you've wanted to get into a hard-disk recording environment that offers full support for MIDI composition, Cubase VST is a program you simply cannot ignore.

MSRP for each version of the program: Cubase VST, \$399; Cubase VST Score, \$549; Cubase VST/24, \$799. For more information, contact Steinberg, 21354 Nordhoff St., Suite 110, Chatsworth, CA 91311. Tel: 818-993-4161. Web: www.us.steinberg.net. Circle EQ free lit. #135.



Shure KSM32 Cardioid Condenser Mic

BY ROGER MAYCOCK

Shure is and always has been known first and foremost as a quality manufacturer of microphones for live sound applications. Much time has passed since Shure made large-format tube condenser microphones back in the 1930s — but with the introduction of their new KSM32, the company appears to be taking off the gloves and shoving its way back into the already-crowded studio mic arena.

The KSM32 is a side-address, cardioid condenser microphone designed primarily for critical recording applications. While the company is positioning the KSM32 as a studio instrument, it can't ignore its heritage, and hence ships the microphone in two different configurations.

The KSM32/SL is the studio package. This version of the microphone features a champagne-colored finish and includes a locking aluminum carrying

case, an elastic-suspension shock mount, a swivel mount, and a protective velveteen storage pouch. The KSM32/CG is the live-sound version. This package features a non-reflective, charcoal-gray finish designed for environments such as live stage productions where reduced microphone visibility is desirable. The KSM32/CG includes a swivel mount and a padded, zippered carrying case.

The new KSM32 features Class A, transformerless preamplifier circuitry designed to eliminate crossover distortion for improved linearity throughout the entire frequency

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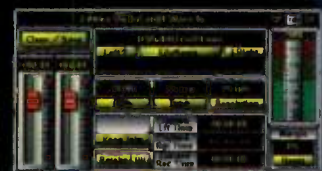
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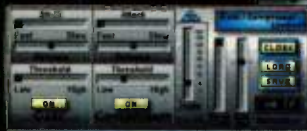
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SAW 32
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Identical in design to SAWPlus32, but less resource intensive, SAW32 offers simultaneous playback of up to 16 mono or stereo tracks and supports up to six stereo sound cards. If you want all the features but don't need all the tracks, SAW32 is for you.

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diaphragm provides extended low-frequency response in addition to excellent transient response. The embossed process creates tiny raised diamond shapes that give the Mylar a three-dimensional texture to increase the overall surface area of the diaphragm, thus improving low-frequency response. Through embossing the Mylar, the diaphragm becomes very durable and resistant to changes in environmental conditions.

The KSM32 has a three-position

high-pass filter switch that is independent of the 15 dB attenuation switch: Flat, Cutoff, and Rolloff. In Cutoff mode, the switch engages an 18 dB/octave filter at 80 Hz and provides greater flexibility in reducing background or vibration noise. In Rolloff mode, the switch engages a 6 dB/octave filter at 115 Hz and is used to counteract proximity effect. The KSM32's 15 dB attenuation switch enables the microphone to handle extremely high sound pressure levels. Its A-weighted self-noise is rated at 13 dB SPL, providing a dynamic range of 126 dB.

The microphone features an internal shock mount to reduce the transmission of handling noise and incorporates a three-stage pop protection grille to guard against lip smacks, breath pops, and similar noises. The KSM32/SL recording package goes one step further by providing an elastic-suspension shock mount that greatly reduces external vibrations.

The KSM32 has the ability to function well in a variety of applications. The microphone is well-suited for voice (solo, background, voiceover, broadcasting) as well as acoustic and wind instruments such as piano, strings, brass, and woodwinds — not to mention ensembles. How does it handle transients? To quote George Rohrer, marketing specialist, "The combination of premium quality components designed within its Class A transformerless electronic circuitry and an ultra-thin, low-mass diaphragm enables the KSM32 to reproduce demanding, percussive sound sources with extreme accuracy and realism." Simply put, it's a solid drum mic — particularly for overhead placement.

As is the case with many such microphones, the KSM32 requires 48 V phantom power. The mic uses a gold-plated XLR connector, weighs in at just over a pound, and measures slightly better than 7 inches in length. Frequency response ranges from 20 Hz to 20 kHz. A windscreen is available as an optional accessory.

Prices: KSM32/SL, \$1029; KSM32/CG, \$959. For more information, contact Shure Brothers Inc., 222 Hatrey Avenue, Evanston, IL 60202. Tel: 1-800-25-SHURE. Web: www.shure.com. Circle EQ free lit. #136.

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- 2 Units may be Cascaded for 32 Tracks

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Yamaha MSP5 Powered Monitor Speakers

BY ROGER MAYCOCK

It happens to all of us. We become slaves to our latest recording, tweaking every last detail to the "nth" degree. We redo tracks countless times over until that one critical vocal phrase finally hits home. We search our sound libraries repeatedly until the one "right" keyboard patch is found. We've mixed the tracks seemingly a hundred times...but now, now the recording is ready.

So we take our masterpiece to this week's gathering of the local songwriter's guild, or the agent we've been promising the tape to for the past month, and guess what? It sounds like hell. The bass is too boomy, the midrange lacks definition, and that hi-hat...that damn thing is so harsh it hurts!

Sound familiar? While inexperience can certainly be a key factor to such disheartening scenarios, there's no overlooking the fact that your studio's monitor speakers are in need of replacement. We never seem to realize just how critical a studio component our speakers are until this sort of situation occurs.

Enter Yamaha's new MSP5 powered monitor speakers. The MSP5 is a bi-amped, 2-way, bass-reflex speaker designed for a variety of studio applications, ranging from home recording to multimedia production to postproduc-

tion. With dimensions of 6-5/8 x 11 x 8-3/4 inches (width, height, depth) and a weight of 16.5 lbs., the MSP5 has a small footprint that makes it right at home in just about any studio environment.

The MSP5 is housed in a jet-black enclosure. The cabinet has a black metal grille over the 5-inch low-frequency woofer, two open ports above the woofer, and a 1-inch high-frequency titanium tweeter at the top. Titanium has long been recognized for providing good frequency response and separation — not to mention long-term durability. The HF dome is recessed into the face of the cabinet, forming what Yamaha refers to as a wave-guide horn that creates a broad coverage area of 120 degrees, free from distortion or sound coloration with uniform dispersion. A volume control is positioned in the lower right corner and a power indicator LED occupies the lower left.

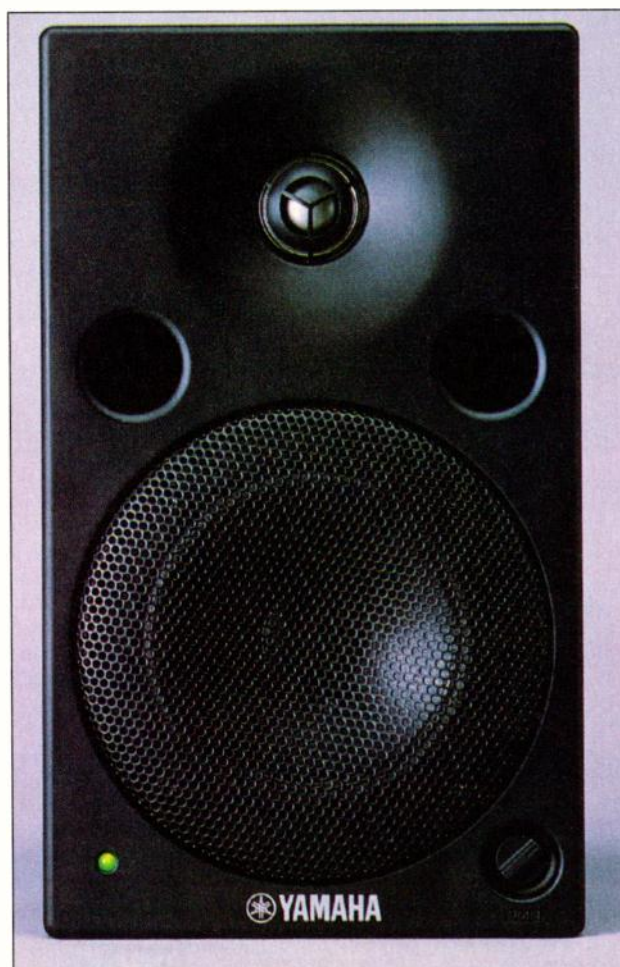
Being a biamped speaker, the division of power boils down to this: 40 watts to the woofer and 27 watts to the tweeter for a total of 67 watts per enclosure. For their intended environments, this level of power is quite capable of generating a considerably larger sound field with very low distortion than would otherwise be expected from an enclosure this size.

For feeding signals, Yamaha provides both XLR balanced and 1/4-inch unbalanced phone jacks on the cabinet's rear panel. There are also trim switches for matching the speaker's response to the acoustic environment. The low-frequency switch offers four positions (indicated as -2, -1, 0, and +1; corresponding to -3 dB, -1.5 dB, 0 dB, and +1.5 dB at 60 Hz) while the high-frequency switch provides three

positions (indicated as -1, 0, and +1; corresponding to -1.5 dB, 0 dB, and +1.5 dB at 15 kHz). The MSP5's signal-to-noise ratio is greater than or equal to an "A" weighted rating of 100 dB.

Overall frequency response of the MSP5 is 50 Hz flat out to 40 kHz — making these speakers a good choice for mastering, where high sample and bit rates are the norm. Rounding out the picture, the MSP5 is a magnetically shielded enclosure, making it particularly well suited as a workstation monitor for media production where close proximity to computers and other video equipment is the norm. Regardless of your type of production, for in-your-face nearfield monitoring, or what speaker manufacturers love to call "point source" listening, a pair of MSP5's make a good choice.

Price is under \$600. For more information, contact Yamaha, P.O. Box 6000, Buena Park, CA 90622-6600. Tel: 714-522-9011. Web: www.yamaha.com. Circle EQ free lit. #137.





Otari RADAR II

BY ROGER MAYCOCK

Otari's RADAR (Random Access Digital Audio Recorder) has for quite some time been unique in the world of digital audio recorders. While many of Otari's competitors initially introduced tape-based digital systems, RADAR represented a departure by virtue of the fact that it was a stand-alone random access system. Of equal importance, it remains one of the very few dedicated hardware recorders as opposed to the more common computer-based approach that augments the computer with additional hardware.

At a time when computer-based recording was very new, RADAR gained favor with numerous commercial facilities due to its familiar tape-based user interface. RADAR I was also quasi-expandable. As each 8-track section used its own hard drive, the system could be configured as an 8-, 16- or 24-track recorder as needed.

Otari has now introduced the second-generation version of the product — aptly named RADAR II. While still possessing many traits of its predecessor, the new unit has changed considerably from a hardware perspective. RADAR II employs 24-bit architecture throughout the entire system and uses a single hard drive for all 24 tracks, yet it retains upward file compatibility with the original by virtue of its ability to operate in either 16- or 24-bit modes.

THE FRONT PANEL

RADAR II's front panel has changed dramatically. Gone are the 24-track arming buttons as well as the 22-segment LED ladders for visually monitoring individual track status. Also removed are the transport keys, dedicated function buttons, and the backlit LCD. So what's left? Three drives and a power switch.

RADAR II takes a different architectural approach, with the main CPU configured for placement into the equipment rack. Of the three drives, the most notable is the new Kingston® removable media carrier, which has become quite popular in the postproduction world, as it facilitates easy transport of a project from one station to another. By incorporating this removable drive system, Otari is clearly positioning RADAR II as a viable tool for this market segment (more on this later).

Beneath the Kingston drive is an Exabyte® Eliant 8mm tape drive for backup of audio files. While RADAR I provided a similar but optional backup system, the new model incorporates this as standard fare in the U.S. market and the Eliant is considerably faster than the original Exabyte 8505. This represents an important change, as backing up files isn't really an option if you ever intend to do a substantial amount of recording.

The remaining drive is the omnipresent 3.5-inch floppy disk drive, which serves as the gateway to fast and convenient system upgrades. As a result of the recorder's in-circuit programmable devices, hardware can also be updated via this method.

THE REAR PANEL

RADAR II's rear panel also reflects a significant number of changes. The 1/4-inch TRS phone jack analog inputs and outputs

continued on page 162



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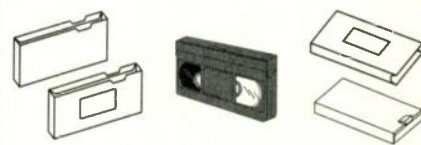
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Digital Converters

Going Beyond Sweet 16 (Bits)

Part I

Six digital converters get put to the test to answer the question "Do you really need a professional converter?"

BY MIKE SOKOL

Doesn't digital audio by its very definition imply that all 16-bit sound cards should sound the same? Or do you read or think about an external AD/DA converter (analog to digital and digital to analog) or professional sound card? You see them in many advertisements, some of which appear in the pages of this magazine. Do you really need to spend hundreds or even thousands of extra dollars for a professional converter, or is it just so much advertising hype designed to separate you from your money? And what about converters advertising 20 or even 24 bits? And what's this 44.1 and 48 and 96 sampling stuff got to do with it all?

The truth is you're not just handling digital audio information, you're converting sound from an analog waveform into digital words and back again. And it's at that point that lots of extra noise, jitter, and distortion can be irrevocably added to your carefully crafted audio. This month we'll talk about how AD/DA converters hook up and their basic operation. Part II (next month) will conclude with converter theory, 16 bits versus the advantages of 20 or 24 bits, higher sample rates, and how the various types of technologies involved can influence the sound of your system.

There are two basic types of converter cards that plug into your computer: ones that have builtin AD/DA converters and ones that are simply interfaces to external converters. For this discussion we'll omit the MIDI ports and sound synthesis features of many sound cards, since MIDI really doesn't have anything to do with the actual sound recording process. Sound cards with on-board converters are bundled with virtually every computer sold on the face of this planet. Typically there are both mic and line-level inputs, which utilize 1/8-inch mono and stereo mini phone jacks, and line-level and speaker-level output jacks, also with 1/8-inch jacks. A 2- to 5-watt amplifier is included on the board, which can drive an external speaker directly, but which is usually teamed with a self-powered speaker and sometimes includes a subwoofer.

These builtin cards can sound reasonably good for game playing, but usually lack the features necessary to incorporate them successfully into a studio environment. First, any mic or line-level signal that cohabits a computer motherboard is in a nasty environment. There are all kinds of digital clocks, switched power supplies, and RF decoupled ground planes that are specifically designed to make your computer go fast. These devices tend to leak spurious signals into any wiring or circuitry in the vicinity, causing all sorts of interference. Imagine trying to design an audio card that will excel in that environment. It's very difficult, if not impossible.

Another set of problems is ground-loop-induced hums and buzzes. Since you'll be hooking up the sound card into your mixing console with an unbalanced connector, your computer chassis will now be tied into your studio ground plane, by design or accident. So you not only get the nice 60-Hz hum we all know and love, but a subharmonic buzz from the computer's switching power supply is often added in to your mix. And finally, the components in the analog signal path of an inexpensive sound card may not be very carefully selected for audio excellence. The mic preamp was most likely designed as an afterthought, and more time and money spent on the MIDI WAV Table than on supplying a decent output stage.

On the other hand, audio interface cards and external AD/DA converters allow for virtually any level of sophistication desired. The best-sounding systems often don't even have AD/DA converters on the computer card itself. For many years I've used a Turtle Beach 56K card hooked up directly to my DAT deck or external AD/DA converter via a pair of coaxial RCA or balanced XLR cables. No actual audio signals ever reach the computer. Only a digital data stream known as AES/EBU or S/PDIF is passed from the external converter to the computer, and back. This normally limits you to a 2-channel stereo signal, but many interface cards now feature optical connectors, which comply with the 8-channel ADAT format.

With the addition of the proper external converter, it allows the computer to act like a true 3-track digital recorder, which can now have hundreds of internal tracks. One possible scenario is to record a live performance in the field with one or more 8-track decks and then load the raw tape tracks into the computer in groups of 8 or 16 tracks at a time for later editing and mixdown. The only real drawback to mastering in higher resolutions is that eventually you'll need to convert your 20- or 24-bit product down to a 16-bit word length for making compact discs. Fortunately, there are many programs available that will intelligently down-convert while still keeping a lot of the signal quality. And remember that in the final remastering stage, the signal is often digitally "bounced" to get the CD sounding as loud as possible. If you don't have extra bits to throw away, then the computer has to interpolate (short for "making it up as it goes along"). In any event, in the digital world, "more" usually is better. "More" used to be unaffordable to all but the chosen few, but now everyone can afford to go to 20 bits. Let's see if it's worth it.

Digital Converters

SEK'D ADDA

"The first thing I noticed when using the 24-bit format (instead of my normal 16-bit) is that my headroom got a whole lot bigger very quickly."

SEK'D was kind enough to include a copy of their multitrack editing program, Samplitude 2496, which, while not being specifically reviewed, made testing of their product quite easy. Installation of the PCI-based interface card was a snap: Windows found the newly installed board, asked for the manufacturer's disc, and it loaded up in about a minute. I'm running Windows 95 (Rev B) on a 233 MHz Pentium with 64 MB of RAM, which was about twice their minimum requirements.

At first try, I got a tremendous static burst from the left speaker on playback, while the right channel was fine. This happened not only with the on-board D/A monitor, but also out of the S/PDIF and AES/EBU jacks as well. So I figured it must be an interface/interrupt problem, and I was right. A little snooping in the device manager for Windows 95 showed the culprit. Even though I had physically removed the previous interface card, the interrupt was the same as the newly installed PRODIF 96. Since I had neglected to shut down the computer after installing the new drivers for the SEK'D interface card, both drivers were loading and doing bad things. So, remember to power down and reset your computer after installing any drivers or pro-

grams, even if you're not specifically told to. This goes for all computer programs and drivers in general. It will save you lots of frustration in the long run.

The ADDA 2496 S is housed in a half-rack chassis and its XLR inputs and outputs allow it to easily interface into any professional console. I would have preferred detented controls for the input and output sensitivity controls, and there's only a single clip light for each channel, which is calibrated for -3 dB before you hit the wall. I tried both mixing from multitrack ADAT tapes and some live studio recording with vocals and guitar.

The first thing I noticed when using the 24-bit format (instead of my normal 16-bit) is that my headroom got a whole lot bigger very quickly. I find that with 16-bit A/D converters, you have to work at it to stay close to 0 VU, where it sounds good. If you let your recording levels lag below -12 dB or so, the sound quickly gets gritty. And if the processing engine doesn't have enough internal resolution for a multitrack mixdown, then it can have the equivalent of running out of digits on your calculator when doing a big calculation. So having lots of extra bits allows you to relax your recording style and go for the dynamic processing after the recording's been done. Twenty-four bits has a theoretical range of 144 dB, but actual dynamic range is rated at around 113 dB.

PRODUCT: SEK'D ADDA 2496 S 24-bit/96-kHz AD/DA converter and PRODIF 96 PCI interface card.

MANUFACTURER: SEK'D America, P.O. Box 5497, Santa Rosa, CA 95402. Tel: 707-578-2023. Web: www.sekd.com.

FEATURES: PRODIF 96 Card includes optical, coax, and XLR interfaces with transformer isolation; on-board 20-bit D/A converter for monitoring; up to 24-bit and 96 kHz sample resolution with ADDA 2496.

PRICE: 2496 S, \$1000; PRODIF 96, \$799

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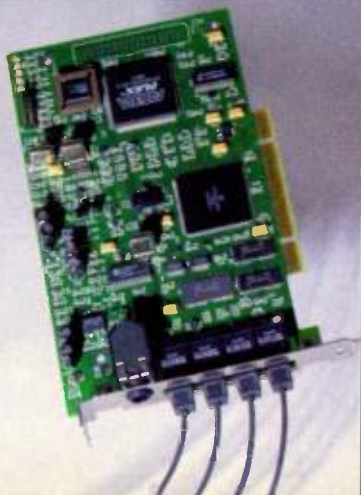
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Digital Converters

SEK'D recommends recording at around -10 dB, which still gives you 100 dB of dynamics and an extra 10 dB of headroom. The high spots sounded great and the room reverbs seem to go on further without breaking up. Next I cranked up the sample rate to 96 kHz and played some maracas. These simple instruments (basically a hollow wooden ball with beans or gravel inside) really put out the ultra-sonic energy, and will quickly overload any microphone, pre-amp, or recording medium that's near the edge of its frequency or headroom limitations. The distortion is easily noticed as a low-frequency "crunch" that obviously doesn't belong. That's why they're the first thing I pick up when I want to listen for transient overloads. A pair of maracas can make many 16-bit A/D converters sampling at 44.1 kHz sound bad, but try as I might, I couldn't get the SEK'D converter to do anything uncomplimentary. There was a subtle, but discernable difference between 44.1 kHz and 96 kHz sampling. For critical mastering, it could be the way to go, but remember that it will eat up your hard-drive space at twice the rate of a 44.1 kHz converter, so prepare accordingly.

Lucid Technology ADA 1000

"For those of you with an analog tape background, it feels like the additional dynamics you get when adding dbx noise reduction to open reel tape."

Lucid Technology is a branch of Symetrix, a company known for making very affordable and excellent-sounding equipment. I therefore had some pretty good expectations for the ADA1000 beyond what its \$599 retail price would suggest. It's a simple 1 RU unit with both XLR and TRS analog inputs and outputs.

The digital signal is interfaced via S/PDIF (consumer coaxial) or AES/EBU (professional XLR) connectors. Two nondetented rotary pots on the front panel allow the sensitivity to be easily set, and a Stereo-Link switch allows the left control to affect both inputs, which is very handy for working with stereo program. An eight-step LED array for each channel gives you a visual indication of the signal lev-

els, and a pushbutton switch allows selection of 32 kHz, 44.1 kHz, or 48 kHz sample rates. All A-to-D conversion is 20-bit, and it will decode a 16-bit signal in the D-to-A section.

I tested the ADA1000 in a number of mixdown sessions, since I had several ADAT tapes that needed to be mixed to stereo. Normally I would mix directly to 16-bit DAT tape, so I decided to go to both the ADA1000 and the DAT simultaneously and listen for any differences between the direct output of the console and in later playback. Now, these were 16-bit ADAT source tapes, but because they had eight tracks of instruments and I was adding dynamics via the faders, it was very easy to exceed the dynamic limitations of 16 bits. As I've mentioned before, 20 bits give you 4 additional bits beyond 16, and each bit corresponds to 6 dB of signal. So, theoretically, there's 24 extra decibels of dynamics to work with. I like to position about an extra 10 dB on top for those "little" surprises, which gives you an extra 14 dB down to the digital noise floor, where a lot of subtle reverb and instrument overtones exist.

For those of you with an analog tape background (and, yes, I do remember analog tape), it feels like the additional dynamics you get when adding dbx noise reduction to open reel tape. There's just more room to breathe and you can take more chances without smacking into a digital wall.

In general, the ADA1000 sounded superior to the built-in AD/DA interface in my Technics SV-DA10 DAT Deck. There was less harshness on the top end, and the instruments (acoustic guitars, vocals, pennywhistle/flute, and accordion) seemed to mix together with less effort. Listening to the direct board output versus the digital playback did reveal a few subtle differences in the AD/DA playback, especially at 32 kHz, as one would expect. But there was more of a sonic change when switching between 44.1 kHz and 48 kHz than I would expect — almost as if the frequency response drooped more than it should at 44.1 kHz. But it was very subtle and only noticeable in a direct-wire-versus-converter comparison. In general, this budget converter seems to be superior to anything I've heard in a DAT deck, and certainly way better than any sound card with on-board AD/DA converters. It's a great way to upgrade the quality of your system without breaking the bank.

PRODUCT: Lucid Technology ADA1000 20-bit A/D and D/A Converter.

MANUFACTURER: Lucid Technology, P.O. Box 1583, Edmonds, WA 98020. Tel: 206-742-1518. Web: www.lucidtechnology.com.

FEATURES: Rack-mount 20-bit AD/DA converter with 32, 44.1, and 48 kHz sample rates; includes S/PDIF and AES/EBU digital I/O; XLR and 1/4-inch TRS analog inputs and outputs.

PRICE: \$599

CIRCLE EQ FREE LIT. #: 139



Benchmark Media Systems ADA2008

"There's really only one way to describe it: it's like being on a wire. Whatever I shoved into it came out the same way."

The ADA2008 is a 4-channel, 20-bit, AD/DA converter with professional features that make it suitable for broadcast and commercial applications. It's basically a pair of stereo

PRODUCT: Benchmark Media Systems ADA2008 4-Channel 20-bit AD/DA

MANUFACTURER: Benchmark Media Systems, Inc., 5925 Court Street Road, Syracuse, NY 13206. Tel: 800-262-4675. Web: www.benchmarkmedia.com.

FEATURES: Four-channel, rack-mount, 20-bit AD/DA converter includes AES/EBU digital I/O (optional BNC, Optical, and S/PDIF connectors are available) and balanced XLR analog inputs and outputs; Varispeed mode allows any sampling frequency between 28 kHz and 54 kHz.

PRICE: \$4200

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Digital Converters

AD/DA converters in a single rack space. Everything is duplicated — there are two AES/EBU inputs, two AES/EBU outputs, and four sets of meters. Redundant power supplies are available for critical applications. Plus there's an external reference input for locking to a master clock such as you might find in a video suite or distributed digital audio edit bay.

Part of Benchmark's claim to superior sound conversion hinges on a philosophy of extremely low jitter: under 9 picoseconds. Jitter is, essentially, a time-base error that produces a fuzzy sampling window. During analog-to-digital conversion, the audio file can be corrupted with whatever jitter-induced distortion occurred at the moment of sampling. And once it's digitized, it can't be removed. Benchmark has taken great care to protect its low jitter figures by adding additional phase-locked loop circuitry that stabilizes any external clock source so that it can't corrupt the sampling process with its own jitter. Pretty cool stuff.

I listened very carefully to the ADA2008 over several live and mixdown sessions. There's really only one way to describe it: it's like being on a wire. Whatever I shoved into it came out the same way. I also looped the digital output of the analog-to-digital section back to the digital-to-analog section and compared it to the source feed. I couldn't hear any difference at all until the fateful moment of hitting the full-scale digital wall.

This thing's built like a rock — from the power supply to the gold-plated connectors. Nonetheless, don't plan on installing it next to your mixing console. There's a rather noisy fan built into the side of the case, which, while I'm sure it will extend the life of the components and increase the stability of the conversion, bugs the heck out of me. That's why all of my computers, drives, and decks are behind my mix position in a closet with a sliding glass door. I hate the sound of fans. This unit is designed to live in a machine closet, not in a studio's console rack. So perhaps my point on the noisy fan is moot. It really is a well-engineered and well-constructed converter.

At \$4200 retail, the price of the ADA2008 may seem excessive for some (although broadcast or commercial mastering houses will find it affordable). Since it's in the direct signal path for digital conversion, any A-to-D converter can cause a complete loss of the digital data stream if it goes down or fails for any reason. If you have to bet the farm on your AD/DA converter, the ADA2008 would be a safe bet.

Frontier Design Group Tango and WaveCenter

"The real advantage is that you only need one ISA slot and Interrupt, and all of the A-to-D converters use a common clock."

Tango is a little different from the other AD/DA converters in this review in that it has eight inputs and outputs. By using an optical interface, it acts pretty much like an ADAT deck, but without a tape transport. This allows your workstation to do true multitrack recording. Additionally, since the optical interface of the WaveCenter is ADAT compatible, it allows you to load in all eight tracks of an ADAT tape into your workstation in a single pass. This is pretty handy for a lot of the type of work I do, since many times I'll make an ADAT recording from the eight subgroups on my console and later remix it for a really high-quality demo tape.

The WaveCenter circuit board installation was a little clunky. Installing an ISA-based card that uses DIP switches to set the Memory Allocation and Interrupts seemed a little too retro for my taste. I ended up pulling a few of my extra cards in search of a free Interrupt. Then, after several tries (some of which resulted in a complete computer lockup), I was able to properly configure the card, which then appeared quite stable. Frontier assured me that their technical support department is willing to assist you with your particular installation. You may not have as many problems as I did, which was due both to the limited number of Interrupts available on a WinTel Platform and the fact that I have just about every device and driver known to mankind loaded on my workstation. Did I mention that I'm a bit of a computer geek?



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Keyboard Magazine - July 1998

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"(PARIS is) a sleek, fast, hardware-intensive recorder that works hard, sounds excellent, and is actually fun to use."

Craig Anderton EQ Magazine - January 1998

"Overall, I'm quite impressed with PARIS, both at the quality as well as the quantity of features available. ...I strongly urge anyone out there considering a digital audio workstation to investigate PARIS closely."

Recording Magazine - June 1998

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CIRCLE 21 ON FREE INFO CARD

Digital Converters



PRODUCT: Frontier Design Group Tango and WaveCenter.

MANUFACTURER: Frontier Design Group, 31 Old Etna Road, Lebanon, NH 03766. Tel: 800-928-3236. Web: www.FrontierDesign.com.

FEATURES: Tango is an 8-in/8-out, 20-bit, AD/DA converter with an optical interface that emulates the standard ADAT format; WaveCenter is an ISA bus interface card with optical, S/PDIF (coaxial), and MIDI ports.

PRICE: Tango, \$898; WaveCenter, \$498. A Tango/WaveCenter bundle with optical cables is available for \$1098.

CIRCLE EQ FREE LIT. #: 141

I used the latest version of SAW Plus to test the multichannel input from my ADAT, and the WaveCenter worked as advertised. You simply tell the application that you've got four sound cards installed — Frontier calls them ADAT 1-2, 3-4, 5-6, and 7-8. You then can selectively fly-in whatever stereo pair(s) you need. With a little help from timecode you could also bring in a second or third ADAT tape in perfect synchronization.

The WaveCenter works the same way with any application that can use multiple sound cards, such as

Cakewalk Pro Audio, Cubase VST, Cool Edit Pro, or Samplitude Studio. But the real advantage is that you only need one ISA slot and Interrupt, and all of the A-to-D converters use a common clock, something that you don't get with a group of stereo cards. This is important for long-term synchronization of multiple tracks, since it's necessary to use the same time-base if you want the tracks to line up properly and not drift.

I was then able to mix out on the S/PDIF output directly to my DAT deck, but could also have used another D-to-A converter if desired. WaveCenter allows you to output 2-track optical if desired, but you can't use the 8-track optical port at the same time since there's only one physical port. That shouldn't, however, be a problem in most installations.

Tango is an AD/DA converter with four or eight TRS balanced analog inputs and eight TRS balanced analog outputs. Digital connection is via ADAT Optical only, and there's a pair of BNC connectors to allow proper word clock synchronization. The optical port has an additional thru connector, which allows you to slave an additional ADAT deck onto the same piece of fiber-optic cable coming from the WaveCenter. Conversion is 20-bit at 44.1 or 48 kHz rates, selectable from the front panel. A rudimentary meter system is included with three LEDs for each channel, indicating signal presence, -3 dB, and clipping, with a selector switch for input or output metering. There are no gain controls, but by changing internal jumpers the sensitivity of any input or output can be selected for +4 dBu or -10 dBV reference levels. A rather large line-lump AC power supply is included, but thank heavens it isn't a wall wart.

Since it looks like an ADAT and talks like an ADAT, does it sound like one too? I'm not sure how it compares to the new 20-bit ADATs, since mine are all 16-bit, but the A-to-D conversion in Tango seems to be superior to the built-in converters in my Black Face ADATs. Plus, having those extra four bits for headroom and noise floor really makes a significant difference. Even though the inputs are 1/4-inch phone jacks, they are wired for a TRS balanced connection, which really helps reduce hum and buzz if properly implemented. Of course, to take advantage of 20-bit resolution, you need to get the rest of your sound chain in proper working order, or it's just wasted bits.

Doing a session on hard drive alone is a little spooky for me because I'm so used to tracking on tape. For those of you who have never lived through a hard-drive crash, you can't understand the sinking feeling you get when the file you've been working on for days or weeks goes to data heaven. I owned a computer communications business for over ten years, and one of the things I did was catastrophic data recovery. Sometimes it would cost thousands of dollars worth of labor to recover a crashed drive, and oftentimes it was gone forever. And guess what? No backups were done in the majority of cases. So if you do decide to get something like a Tango and record direct to hard drive, get a way to back up large amounts of data quickly (which you'll need since multitrack digital files are *huge*). You don't want to have to tell your client that the solo of a lifetime just went away when your drive crashed.



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CIRCLE 35 ON FREE INFO CARD

Digital Converters



Canorus dCS 952 & 902

"If I had an unlimited budget for such things, then putting a pair of the dCS converters in my studio would certainly have a big WOW factor."

I've never had the opportunity to work with separate analog-to-digital and digital-to-analog converters before, so this pair certainly caught my attention when I opened their boxes. Note that each rack-mount unit does one thing or the other (A-to-D or D-to-A). You need a pair to make a complete AD/DA system. And also note the price — a pair will set you back the cost of a car. But does all the extra space and money really gain you anything over the lesser priced competitors, which can do basically the same thing for 90 percent less money? Tough question.

PRODUCT: Canorus dCS 952 D-to-A and 902 A-to-D Converters.

MANUFACTURER: Canorus, Inc., 240 Great Circle Road, #236, Nashville, TN 37228. Tel: 615-252-8778. Web: www.canorus.com.

FEATURES: Separate A-to-D and D-to-A converters with up to 24-bit resolution and 44.1 kHz or 48 kHz sample rate; models available with 96 kHz sample rate.

PRICE: dCS 952, \$6500; dCS 902, \$6500

CIRCLE EQ FREE LIT. #: 142

Consider the dCS 952 and 902. Both are ruggedly built, with all of the appropriate connectors and switches on the back panel. Digital outputs include both S/PDIF optical and electrical and AES/EBU (XLR), while digital inputs include a pair of S/PDIF and AES/EBU connectors.

The 952 D-to-A converter has a set of selector switches on the front panel that allow you to select from multiple sources, and a display shows the frequency of the decoded data stream. The 902 A-to-D has a set of selector switches on the back panel for 16-, 20-, or 24-bit operation and 44.1 or 48 kHz sample rate. Having a manual switch for word length on the A-to-D converter with an auto-switching D-to-A gave me the opportunity to really do an A-B-C test with 16, 20, and 24 bits on live and recorded material. It's tough to rate the "sound" of a good converter, since it should have none at all; it basically should sound like nothing. But the 24-bit position came as close to being on a wire as I've ever heard. After a few minutes of 24-bit listening, the 20-bit program sounded a little grainy and the 16-bit sounded real-

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- RECORDING
MAGAZINE



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World Radio History



ly lacking, even though the 16-bit program sounded fine at first listen.

I did A-B it with 16-bit output to my standard in-house converters, and it sounded about the same. So I conclude that it's way too easy to get used to 20- or even 24-bit resolution. Both of the dCS units performed without any burps, buzzes, or surprises — even when I was hot-switching the word lengths and sample rates. And, again, I never could get them to do anything unflattering, even with very hot signals containing lots of ultrasonic overtones. They just quietly did their job.

If I had an unlimited budget for such things, then putting a pair of the dCS converters in my studio would certainly have a big WOW factor. Some of us may not be able to afford the dependability and confidence you get from using industrial-strength gear, but you should never stop wishing.

Zefiro Acoustics InBox

BY GUEST REVIEWER
WADE MCGREGOR

"The small size and light weight of the unit make it suitable for portable use (especially if using the optical output), while the great audio performance makes it useful in the project studio, too."

The Zefiro InBox provides a simple and effective way to interface the analog world to the digital world. This small aluminum box provides two balanced analog audio inputs

that are converted to a stereo 20-bit S/PDIF digital audio signal. The blue brushed-aluminum case offers rugged portability and can simply be clipped onto your belt or the strap of your portable recorder. Now you can add a high-quality mic preamp/converter to your DAT or MD recorder without needing an equipment rack to carry it.

The InBox offers two small trim controls to allow the input level for each channel to be adjusted over a 40-dB range. These inputs accept analog signals between -6 dBu and -46 dBu for full-scale (0 dBfs) digital output. The noise floor of the unit is approximately -98 dBfs, which is slightly better than 16-bit performance while still high enough that no additional dither noise is needed when connected to 16-bit digital devices, such as DAT machines. The noise is well below the noise floor of most dynamic microphones and is free of clock noise or other digital artifacts. The gain may not be enough for distant miking of some acoustic music (choirs, string ensembles, etc.), but then the unit doesn't provide phantom power for the condenser mics typically used for these applications, anyway.

As a 2-channel converter for digital audio cards in a PC, the InBox offers an excellent interface between an analog mixer and the S/PDIF input of the sound card. Two forms of

PRODUCT: Zefiro Acoustics InBox 20-Bit A-D Converter/Mic Pre-amp and ZA2 PC Card

MANUFACTURER: Zefiro Acoustics, P.O. Box 50021, Irvine, CA 92619-0021. Tel: 949-551-5833. Web: www.zefiro.com.

FEATURES: Low noise floor; simple operation; adjustable gain that is difficult to accidentally change; lightweight yet solidly built.

PRICE: \$295

CIRCLE EQ FREE LIT. #: 143



ZEFIRO ZA2 DIGITAL AUDIO INTERFACE CARD

By Wade McGregor

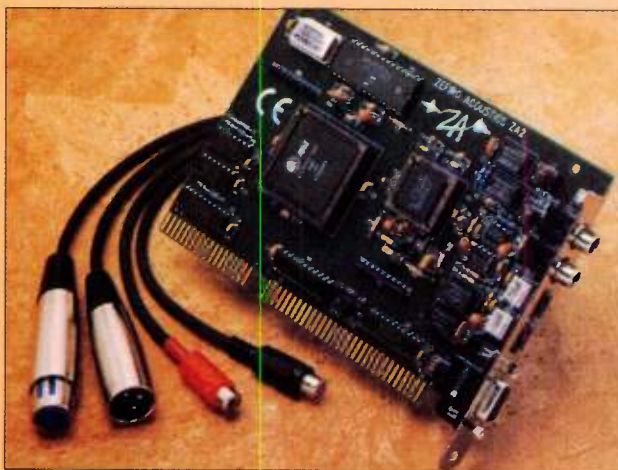
Sound cards in PCs are notorious for the difficulty they create during installation. The Zefiro ZA2 (\$495), however, was absolutely painless to install under Windows 95 and 98. Not only does the unit actually work with the "Plug and Play" feature of these operating systems, it also requires few system resources. The card can work without any of those rare IRQs (although it can be selected in software for Windows 3.1 or DOS), and the simultaneous record/playback uses 16-bit DMA channels that are always available. (The current drivers support the Windows NT 4.0 operating system, as well.)

The ZA2 is a professional-grade digital audio interface that accepts up to 24-bit signals in AES/EBU, S/PDIF, or TOSLINK (Optical) formats. The native sampling rates include: 32 kHz, 44.056 kHz (video post), 44.1 kHz, and 48 kHz, but the on-board DSP will allow on-the-fly sample-rate conversion for sample rates between 5 kHz and 60 kHz and the card can be synchronized to external clocks from any of the three digital input signals. The card ships with all of the connectors for the three formats of digital connection and also provides an analog monitor output for direct connection to your studio monitor amp (if you're the minimal type). The toolbar icon offers access to an input selector that allows you to have all three signal formats connected and simply select the appropriate source as needed.

The audio quality from the ZA2 is flawless. It quickly synchronizes to external digital audio sources and provides very stable performance in any Windows audio program. The sound was transparent from within Sound Forge, Cool Edit Pro, and Cakewalk Pro Audio. This ISA-bus card supports up to 24-bit audio signals; however, this is dependent on the software application. Two ZA2 cards can be synchronized to allow 4-channel playback. The onboard DSP can also provide MPEG decoding and manipulate the subcode within the digital audio stream. The card also has an optional input cable for super word clock (256X sample rate) for synchronization within sophisticated digital audio environments.

The control panel for the ZA2 installs on the WIN95/98 toolbar and allows the user to switch on/off Pre-emphasis, SCMS copy protection, or the internal test tone generator. All outputs are on simultaneously, while the inputs are selected using this control panel (providing digital patching and format conversion). There is also an excellent input meter that shows a real-time waveform or an X/Y plot of phase/level that is akin to the oscilloscope I used to use on all my remote recording sessions. The X/Y plot is the best way to keep track of the relationship between the left and right channels when using stereo microphones or during the final mix.

I connected the ZA2 directly to the AES/EBU option card on a Yamaha 01V mixer and it offered flawless connection between the PC and the mixer. If you work in the digital domain and you want to stay there while passing the signal through your PC, the Zefiro ZA2 provides an excellent interface. Its deft use of PC resources allows it to co-exist with other sound cards in a PC without the usual IRQ and DMA conflicts. Although there are many sound cards available for the PC, very few offer this level of functionality with so little difficulty during installation or use. The ZA2 is the best 2-channel sound card I have ever used.



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Digital Converters

digital connector are provided: the TOSLINK format of plastic fiber optic cable (good for short distances only) and the common coaxial connection typical of many sound cards, DAT machines, MD recorders, and signal processors. The coaxial connector is usually an RCA-type connector terminating a 75-ohm coax cable, but the InBox uses a 3.5-mm (mini-jack) connector, instead.

While the 3.5-mm jack is small, it suffers from mechanical problems, such as not latching, easily broken, and (most commonly) intermittent signals when the cable is strained. Unfortunately, a momentary loss of signal in the digital domain will usually require the receiver (DAT recorder, sound card, or whatever) to mute for five seconds or more while it resynchronizes to the signal.

The InBox runs for about 9 hours on a single 9 V battery that is easily installed in the smartly designed case (no doors or clips, yet secure!) or from an optional external 6 to 24 V DC source. The small size (15 L x 8 W x 4 D mm) and light weight of the unit make it suitable for portable use (especially if using the optical output), while the great audio performance makes it useful in the project studio, too. The InBox is a smart little package that can solve your need for a good mic pre-amp (without phantom power) and a good digital converter for less than you might expect to pay for either.

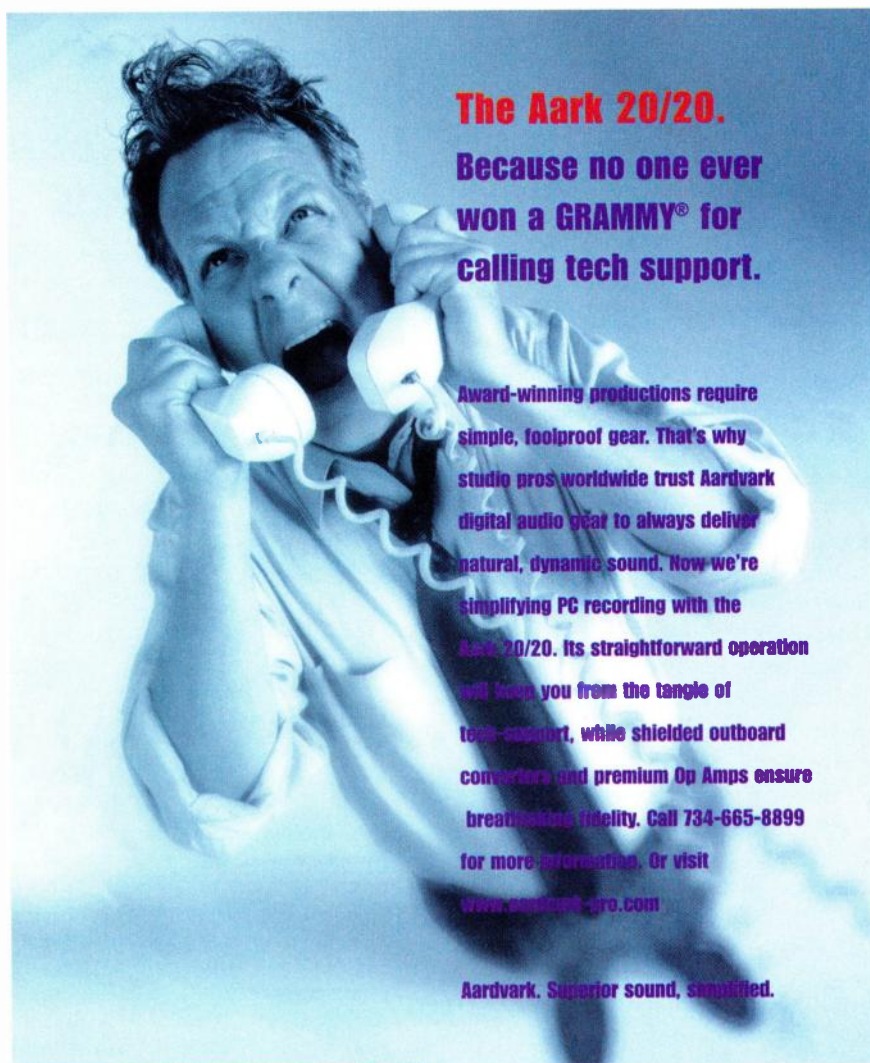
Wade McGregor is a principal consultant for Mc2 System Design Group, an acoustical consulting firm based in North Vancouver, BC. For more info, visit their home page at www.mcsquared.com.

Outro

"Come back for Part II next month...."

This month we've reviewed six manufacturers' external A/D converters and computer interface cards with prices ranging from under \$295 all the way up to \$13,000 for a pair. Does all that money really buy you anything? Come back for Part II next month when we'll discuss the various technologies involved and how they influence the price and sound quality of AD/DA converters. There will be a math quiz for all you computer geeks (just kidding). Plus I've arranged for a real-world listening test with some of my engineering and audiophile buddies, who will give you their opinion on practically any subject (just try to stop them). See you next time.

Special thanks to SEK'D and Innovative Quality Software for sending me the latest versions of Samplitude 2496 and SAW Plus, respectively. It really made testing and comparison of all these converters much simpler.



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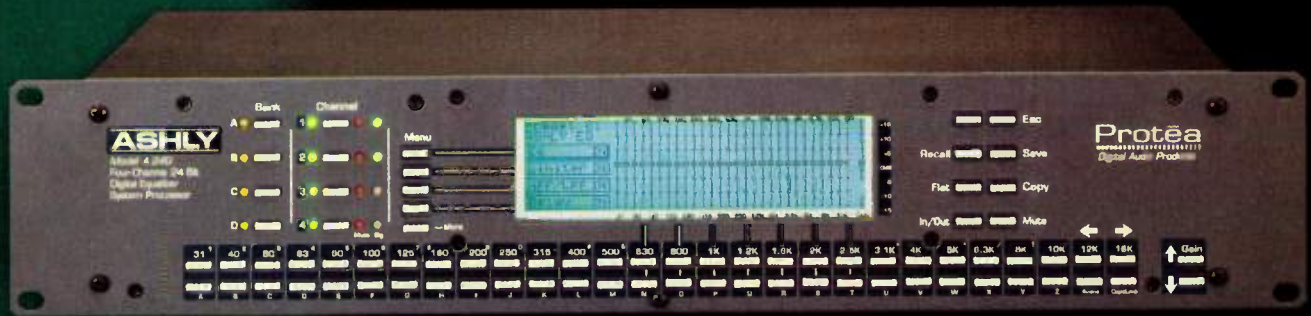
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CIRCLE 07 ON FREE INFO CARD

World Radio History



FRANK FILIPETTI Helps Pavarotti & Friends Entertain the Crowds and Record the Shows

BY MIKE SOKOL



RECORDING PAVAROTTI & FRIENDS LIVE

FRANK FILIPETTI
DESCRIBES HOW HE
HANDLED A TRICKY
LIVE—RECORDING
SITUATION

By Mike
Sokol

Some people have all the fun. Last June, renowned recording engineer Frank Filipetti got to do the recording gig of a lifetime. Imagine going to a little village in Italy to do a remote broadcast and recording session. And not just any session. The main attraction was Pavarotti, who is joined in duets by some of the most talented stars on the planet. How about Celine Dion, Jon Bon Jovi, Stevie Wonder, The Spice Girls, Trisha Yearwood, Vanessa Williams, and more, all within the space of a few hours? Then put producer Phil Ramone in the driver's seat and a 65-piece orchestra backline for a little extra fun. And did I mention this was also a live worldwide television broadcast? Feeling a little pressure yet? OK, now do the whole thing with a bunch of Yamaha 02R consoles linked together in a never-before-assembled configuration. Pressure? Yes. Boredom? No.

EQ: I do a lot of live-recorded production regionally with orchestras and electric acts outside, but this seems like a bit over the top of anything that I've ever seen. How long



DYNAMICS DUO: Producer Phil Ramone (left) and mix engineer Frank Filipetti with the production truck's Yamaha 02R.

did it take you to set up this event? Frank Filipetti: We started working on the show several months in advance. Although I was the chief engineer on the project, I was working closely with John Pellowe, who travels around with Pavarotti. This was the second time we've done a show like this. The way it worked the first time was that we had two trucks, with John in the first truck and me in the second. John took care of most of the orchestra premixing and I did all the band stuff and the final mix. So from his truck he sent me a 4-channel version of the orchestra and I did the final mixing of the vocals and so-forth for the air feed.

This time I did it differently because I felt that the previous system

was lacking. I came up with the idea of doing everything in one truck. By using Yamaha 02R's for the recording medium and using the built-in mixing desk as the mixing medium, we'd all be in the same truck. It was very difficult — we had a 65-piece orchestra, and bands of various types from pop, to rock, to country, to jazz. All in all, it was quite a complicated setup.

Was there anything you learned about microphone choice and placement from the previous show that helped you on this one?

Yes. The overhead string microphones became pretty much useless when used with any of the pop bands, the house band, or live drums. On the previous show, we had a select group

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CIRCLE 31 ON FREE INFO CARD

of bug microphones on the strings, but this time we decided to wire up the whole section because — especially with the pop groups — they were much more useful than the overheads.

Because of the bleed-through from the loud stage?

Exactly.

What kind of bug mics did you use on the strings?

They're actually a house brand built by some fellow who developed them for Pavarotti. John had been using them for quite some time with Pavarotti — in fact, that's what we used the last time.

The developer came up with some modifications based on what we had learned, and this time they worked very well.

How did you mic the rest of the instruments? Did you use more traditional microphones?

We ended up using Schoeps MK4's on pretty much the rest of the orchestra. We started out using the Audio-Technica 4041's on the bulk of the orchestra, and they sounded great, but we ended up going back to the Schoeps because we didn't have proper windscreens for the A-Ts. It got very windy during the first day of setup, and A-T has a heavy-

duty windscreen, but we didn't have any there in Italy and couldn't get any quickly enough.

So, basically, you used the house board in the truck to provide a real-time feed for the television uplink and the Yamahas for the digital multitrack recording.

Correct. I felt the most critical part of the production was the quick changeover times — from pop to classical, back to pop, then to rock, to jazz, and back to classical. You get the idea. In a show like a Grammy show, generally speaking, you have 10 or 15 minutes between the acts while presentations are going on to make the switch. In this instance, these changeovers had to be done almost instantaneously, within a couple of minutes, and the Yamaha digital boards with their scene memory capability worked flawlessly.

So did you have any actual rehearsals, or did you just put the acts in position and light the fires?

Each act would do a rehearsal a couple of days before the performance. But the dress rehearsal was canceled because Pavarotti wasn't feeling well, so we never had a run through. Our run through was the night of the show. We were fortunate in that we had a huge number of inputs. The less people had to go switching mic pres, EQs, etc., the better off we were going to be. **What was the recording truck like?**

I was looking for a truck with an AMS Neve Capricorn, which is my



MAN AT WORK: Filipetti at work during the show.
BELOW: Front view of the Yamaha consoles.





preferred recording and mixing console, partly because it's all digital. After working on some live gigs, especially the James Taylor PBS special I just completed, I found that the Capricorn is wonderful for live recording because every band or every song can have its own little configuration. As you do a rehearsal, you set up the configuration, you name it, and then when the act or song happens you click a button and go back to that configuration instantaneously. Everything changes — whatever routing assignments you had change, whatever EQs you had change, whatever gain structure you have on your preamps change. So you don't have 15 people hanging over the console trying to make these adjustments all at once.

...Making a last-minute patch under fire? That's right. And you'll always forget something. You'll always move something in the wrong position and suddenly you're in the middle of a take and something's missing. It may take you halfway into a song for you to discover that some esoteric mic isn't on until they have their moment in the sun. So it's just a nightmare when you have something like 130 inputs to try to keep track of. But there weren't any Capricorn trucks available in Europe, so I came up with this idea of linking six 02R's and three 01V's together and using them as a front-end for the recording. I could then have all my inputs under digital control and take the 96 returns from the digital tape decks and put them in the built-in console for the live mix feed.

So that was your confidence — monitoring off of your digital tape... Exactly. So I would know really quickly if something wasn't working properly because every microphone input had a channel on the tape, and that in return was my live feed, except for a few channels that were combined.

Did you use any outboard mic pres? No, being that I had done James Taylor's (Grammy-winning) *Hourglass* album using the Yamaha (02R) and had a lot of experience with it, I had complete confidence in the quality and reliability of the board's built-in mic pres. With a few changes, such as some better AC power and more air conditioning for the truck, I wouldn't hesitate to do it again the same way.

Any moments of sheer terror on this gig? I had brought in a Nvision word clock generator along with a 16-way distrib-

ution system to feed the two sets of 96-track digital recorders. During rehearsals, everything would be sounding great, then all of a sudden, for a 2- or 3-second period of time, you would hear a loud whine, all the audio would go dead, and you would hear this *beeeeeep* with crackle on it. And it was part of the live feed. We thought we tracked it down to the power cable on the Nvision unit, and thought we had it fixed the morning of the show. It worked fine all day, but five minutes before the show starts, we hear *beeeeeep!* At that point

we just didn't know what to do except keep everyone out of the truck and away from the wires as much as possible. So there was no movement allowed in the truck whatsoever, and it worked fine during the show. But it was a terrifying moment when it happened so close to airtime, and there was nothing we could do about it if it decided to go.

Well, on that note, do you have any advice for recording engineers planning live events?

The only thing I tell them is that whatever you think you've planned for, you haven't got a clue....



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You Got Some CASE

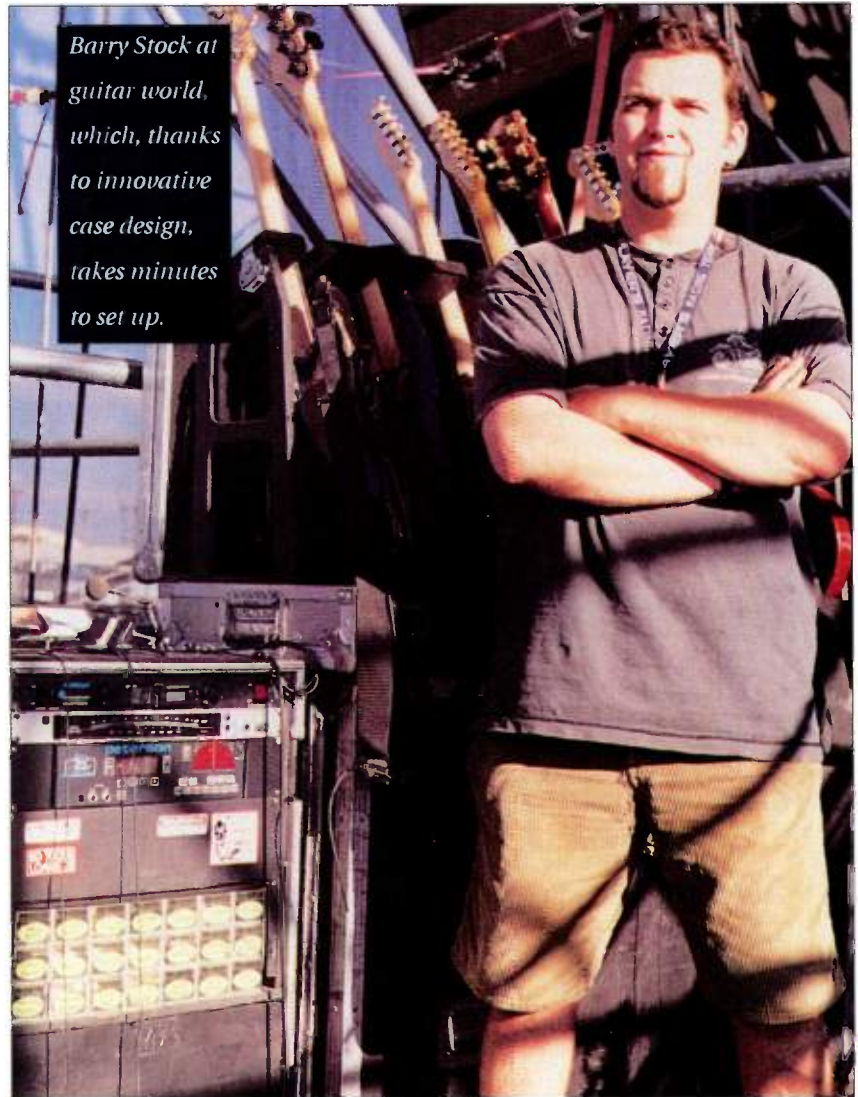
TWO ENTERPRISING
ENGINEERS FIGURE OUT
HOW TO MAKE LIFE ON THE
ROAD EASIER THROUGH
SOME SMART PACKING

By Steve
La Cerra

When you're out on the road all year long, your equipment takes a beating, and flying or trucking the stuff around certainly doesn't help the beating your gear is already subject to just from normal use. So if you really want to take good care of that vintage Strat or \$10,000 carbon-fiber drum kit (or even the band's merchandise), you better get yourself some cases — or suffer the consequences. *EQ* recently met up with Ken Schultz and Barry Stock — both of whom work with April Wine — and looked at some neat ideas for protecting your wares out on the road.

Based in Canada, April Wine is a band that carries a huge drum kit and a minimum of seven guitars and basses. April Wine tour manager/sound engineer Ken Schultz and guitar tech Barry Stock have their hands busy and their road cases filled. As veterans of the road, they've come up with some very cool ideas for carting the band's instruments safely and efficiently.

First on our list are the cases for drummer Jerry Mercer's Monolith kit (that's the brand name, not just the size of the kit...). According to Ken, "We were carrying a kazillion spare heads and nine times out of ten, it's just Barry and I on the crew. One of our complaints was that we had all these little things to chase around — heads, spare parts, this and that. One day Barry was cursing me out



Barry Stock at guitar world, which, thanks to innovative case design, takes minutes to set up.

PHOTOS BY STEVE LA CERRA

because of all these loose skins floating around and we realized that there was this huge 3-inch lid on a 3- x 4-foot drum case and it was empty. We got some plywood, partitioned it according to the head sizes, and made compartments so that all of the spare skins go into the lid of the drum case. Now we carry six full head changes, which lasts us a summer, and they're safe from damage.

"In the bottom of this case we store two snare drums, four toms, a cowbell, fire bell, stick bag, vocal mic, and some other crap. The second drum case is a long coffin that holds the large rack tom and two floor toms. In the lid of that case

we store Jerry's carbon fiber drum rack. Previously, the rack traveled in three pieces and was riding around loose on the trailer. There had to be a way to make it safer without adding another case. All of the mounts on Jerry's rack are locked with position locks. We tore it apart and labeled everything 1 through 6, so that every joint has a number on it. You grab a piece labeled '1' and mate it with the other piece labeled '1.' The next thing you know, you have a U-shaped rack. It's quick, it's simple, and it's clean." Ken and Barry have divided the lid with foam blocks to hold the various rack parts in place, and then two steel arms snap into



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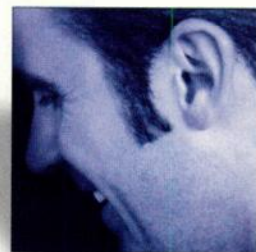


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place from one end of the lid to the other, securing the rack from falling out of the lid.

BARRY STOCK'S GUITAR WORLD

As a guitar tech with his own shop (Barry Stock's Guitar World in Alton, Ontario), Barry is accustomed to having a proper workplace to do guitar maintenance. His work case holds just about everything he might possibly need to maintain and repair a guitar or bass. The top serves as a work surface while the main area of the case interior holds parts and tuners. A set

drawer like you'd find in a hardware store. This holds tuning pegs, 1/4-inch jacks and plugs, picks, tubes, bridge parts, and potentiometers. I had to jerry-rig the bin drawers into place with a rack shelf. When I used a certain number of drawers across, it fit the rack width. The drawers go three high, and by turning the rack shelf upside-down and screwing it in against the top of the bin, the shelf sandwiches the bin against the other units in the rack. A thick piece of foam is glued into the lid which faces the drawers, keeping them from opening when the case is moved around."

In addition to maintaining these instruments, Stock also has to keep them tuned and ready for guitar changes during an April Wine performance. Barry and Ken were frustrated by commercial guitar stands and decided to build their own. Ken bemoans the fact that they've "seen a zillion junk stands, and everybody was pontificating on how great these stands are. Barry had one that he didn't like because it had these j-shaped notches where you lay the neck in and lean it back into the notch to stand the guitar up. When we started using it we thought it was the cat's ass, but — like everything else you bring out on the road — we discovered that it doesn't work.

and pieces to set up the yoke [Editor's note: the yoke is the piece of the stand that supports the necks of the instruments]. But on the typical guitar stand, the yoke is not perpendicular to the neck, and you need a gate to lock the neck so it won't fall out. We started with this big old keyboard case. You open the hinged lid 90 degrees, and the inside of the lid has a single hinge for the yoke. When you stand the yoke up and lock it, it's perpendicular to the neck so the guitar leans into the yoke naturally, and sits perfectly against the front edge of the case bottom. The neck is not sitting on a hard corner-edge of the yoke. It's sitting on a padded surface the whole way 'round. There's no gates on the yoke, and it really protects the necks from damage. I have handles on the end of that case so, if I needed to, I could have it completely loaded with guitars and two guys can lift the case and move it around — and the guitars won't fall out."

A flap on the inside front edge of the case flips over the hardware and latches, protecting the guitar bodies from harm. Barry notes, "Whereas a lot of cases hold electric guitars only, this thing can hold eight acoustic guitars because I left a lot of space in between guitar positions. This one is still a work-in-progress. We're going to permanently mount the light inside the lid and we've designed a lock that is a long, rubber-covered steel rod that sits on top of the yoke across all of the necks. If I decided to leave the venue for dinner, I won't have to put the guitars away. I can lock them down and leave them there. Someone would have to take all of guitar world to get them out, and, hopefully, security at the venue is smart enough not to let someone walk out with the entire guitar world!"

MERCHANDISE MERCENARIES

Any band that does as many dates as April Wine is concerned with merchandising. When the band goes to small clubs, merch arrangements are the responsibility of the band (as opposed to larger venues that provide in-house vendors). Keeping the merch safe is a road case that appears to be nothing more than a standard coffin case. Ken describes this case as "a chicken coop design. It's a 2 x 5 (foot) typical road case on wheels with a hinged lid. In order to use it, we stand it up on it's end and open it. The main left compartment has the chicken coop, with 6 x 3 rows of slots for the merchandise, and an extra storage area below where we can jam an amazing amount of shirts.

continued on page 162



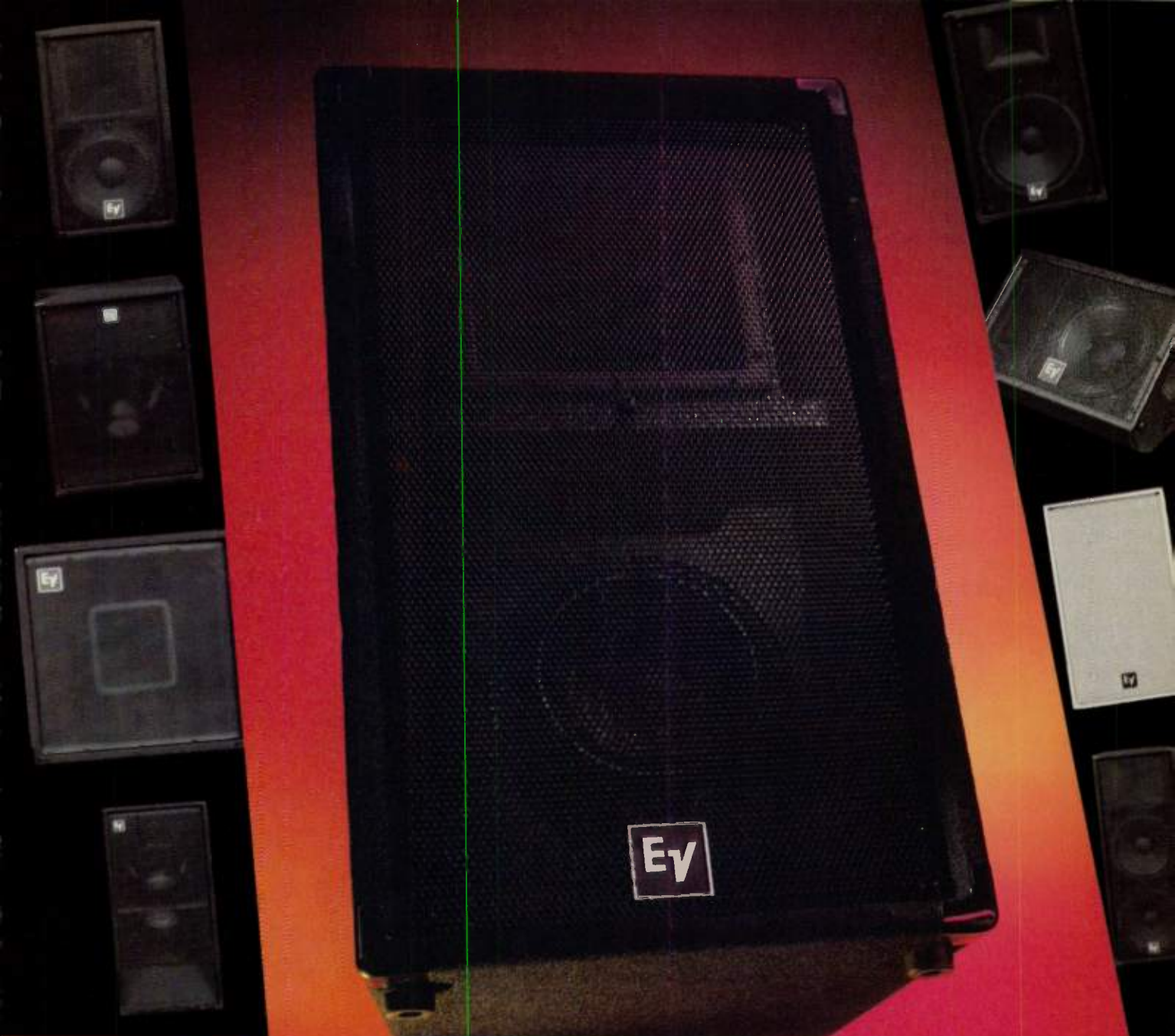
Top: Ken Schultz shows off the drum head storage lid. Bottom: The merchandise case, with the chicken coop on the left and display case on the right.

of large drawers are used for strings, tools, and bigger items.

"To keep track of smaller parts," Barry explains, "I have a standard bin

Barry had an old keyboard case and we used it to start building this guitar stand."

"The old stands we were using," Barry continues, "had all these hinges



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CLUB PROFILE: SWACKHAMMER'S

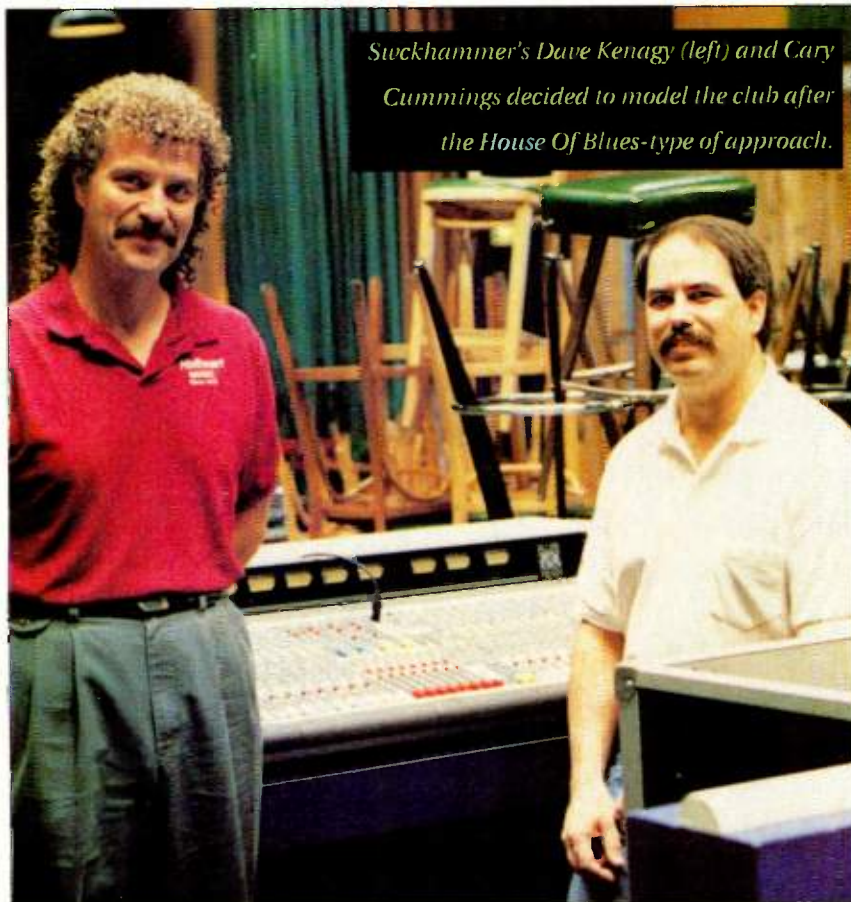
IT'S OPENING NIGHT
FOR SPOKANE'S NEWEST
LIVE MUSIC VENUE

By Steve
La Cerra

It's not very often that *EQ* gets to visit a venue on opening night, or even while it's still a work-in-progress. But such was the case for us recently when we stopped in at Swackhammer's in Spokane, WA. With a capacity of 500 and a beautifully designed PA and lighting rig, Swackhammer's promises to become Spokane's prime club-tour stop for national acts. When we dropped in, the club was literally putting the finishing touches on the room, and we witnessed their first major show, which was a huge success to say the least.

Swackhammer's was remodeled from what used to be a billiard hall. Club owner Mitch Henderson initially contacted Dave Kenagy, the pro audio department manager of Hoffman Music (Spokane, WA) to make the audio system happen. Near the beginning of July, Dave called in audio systems engineer Cary Cummings to help work out the details and supervise the install. Cary explains that the basic equipment design of the system "was modeled after the House Of Blues-type of approach. Dave had prepared the system design and a basic equipment list (which we later revised), but hadn't made any purchases yet. We had a few meetings with the contractors to bounce some ideas around, and, within about three days, a lot of changes happened."

When an electrician was brought in to evaluate the existing AC service to the building, (the electrician) discovered that there wasn't sufficient service available to power the audio system, so a new transformer would have to be installed for the AC supply. In terms of time, this was a setback from the planned opening date of

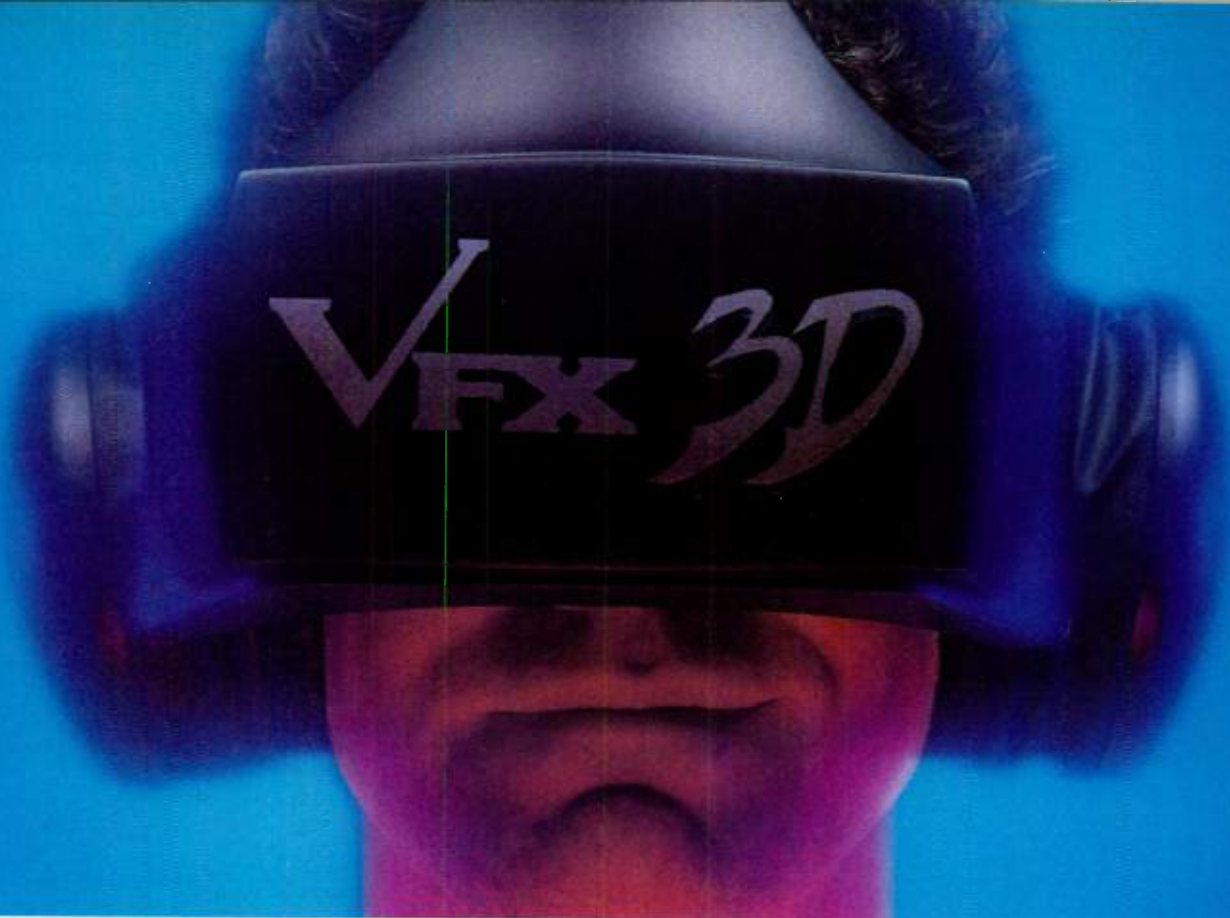


Swackhammer's Dave Kenagy (left) and Cary Cummings decided to model the club after the House Of Blues-type of approach.

July 26th to August 9th. At one of the contractor's meetings during the first week of July, they discovered that the official opening night would be August 1. Essentially, Dave and Cary had a month to plan the install, acquire the gear, get it delivered, and have the entire rig wired up, running, and ready for the show.

One of the things that Dave and Cary liked about Swackhammer's was that they were able to design the system literally from the ground up. "We had electricians come in and pull lines from the transformer to a LynTec AC Load Center circuit breaker box," says Cary. "They also pulled circuits from the breaker box onto the stage. Then I pulled 13 circuits from the LynTec to the amp rack (one circuit per power amp), and two circuits to the front of house and monitor mix positions." The LynTec box Cary refers to is an automated, sequenced circuit breaker box that makes for a very cool way to turn the system on and off.

According to Cary, "The system is key-locked for turn-on and turn-off, and the entire system — monitor and house PA — is powered up with a single switch. Without the key, the On and Off switches do not operate, keeping the system safe from accidents. When the switch is turned on, it sends a simple relay signal to the LynTec box. Each breaker in the box has a small motor that turns the breaker on or off, and the breakers can be sequenced via the relay so that particular pieces of gear turn on or off first. For example, in the powering up process, the low-level circuits (i.e., the monitor and house mixing position) are turned on first. Four seconds later, the power amps begin to come on one at a time. Even though the equipment list was already done, I really pushed for the LynTec because you don't have to worry about people turning things on and off in the wrong order. It really makes the whole thing a turnkey operation."



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THE LAUNDRY LIST

Both house and monitor consoles are Allen and Heath GL3300's — 32 x 8 for the house and 24 x 8 for the monitors. On either side of the 30-foot x 17-foot stage are two flown cabinets: one JBL Venue Series 3215-6 (triamped) cabinet for the main area of the room, and one JBL Sound Power SP212A hung underneath the 3215-6. While the 3215-6 uses a 60-degree horn for long throw out into the room, the SP212A uses a 90-degree horn and acts as a downfill for covering the areas nearest the stage. On the floor (below the fly) are two JBL Sound Power SP218S subs, each with two 18-inch drivers. In an effort to expedite the array process, Dave sent the room dimensions and speaker cabinet complement to Jay Fullmer at JBL for a computer analysis. The analysis suggested starting points for the height, direction, and angling of the fly (the cabinets were flown by Jon Generette of Silhouette Lighting, Spokane).

Dave and Cary planned eight monitor mixes, two of which are flown JBL Sound Power SP215-9 sidefills (flying them frees up stage floor space), and six of which are JBL SR4706A bi-amped wedges. One of the really nice things that Cary built into the system was a Speakon panel for connecting the wedges. On either side of the stage are identical panels with six Speakon connectors. Each connector is fed with a bi-amped mix from the amp rack.

But rather than terminate the speaker cables directly to the Speakon connector, Cary devised a clever little twist that makes the monitor system infinitely flexible. On the rear of the Speakon panel is a terminal strip that accepts the lines from the amps and distributes them to the appropriate Speakon connector for the wedge mix. In the event that a change or reconfiguration to the monitor system needs to be made, the jumpers from the strip to the Speakon connectors can simply be repositioned (see photo 1: terminal strip).

Since there are panels at either side of the stage, Speakon cables can be run according to where the wedges are placed and not depend upon where the amp rack lives (this cuts down on stage spaghetti). There's also a set of similar terminals in the back of the power amp rack, so the amps can be reconfigured just as easily (same with the fly speaker breakout, and subs).

All amplification for the house and monitor system lives in a rack near monitor land and employs two Crown Macro-Tech 3600VZ's, five Micro-Tech

2400's, one MT-1200, and five MT-600's. One amp channel is used for each transducer, so the amps are looking at 8-ohm loads. Cary notes that he could "double the cabinetry because the amps are just cruising. I have the horn gain on the top cab set to -9.5 dB, so there's a lot of headroom." In fact, after a two-hour hard rock show that pounded the walls of Swackhammer's, the amp rack was barely warm.

For house EQ and system control, Dave and Cary choose JBL DSC260 digital system controllers and Sabine ADF-4000 Power-Q's. The L/R master bus from the Allen and Heath console is sent into the first Power-Q, which serves as a "master" house EQ. Stereo output from this unit is then sent into two JBL DSC260's, one used for each channel (left and right) to perform crossover, limiting, EQ, and delay functions. Each DSC260 has six individual outputs that Dave and Cary configured as downfill, subs, lows, mids, and highs.

An interesting tweak that Cary and Dave have worked on is phase alignment of the various drivers in the array. Via the DSC260's, the tweeters and woofers within a cabinet can be delayed relative to the midrange drivers, thus improving time alignment. Further improving the phase response, Cary plans to use the DSC260's "to delay the house system so that it is time-aligned to the backline. The backline is against the rear wall of the stage, so I'm thinking about delaying the house by about 14 feet [*the DCS260 can show delay time in mS, feet, or meters — Ed.*], which will let the backline "catch up" to the PA and tighten up the wash by reducing phase cancellation. When the stage volume is very loud, delaying the PA to line up with the backline makes a big difference. Also, the fly is slightly forward of the subs, so I went in and delayed the fly by about one foot to match the acoustic center of the sub."

Swackhammer's production manager Dave Strelz picked out a first-class backline of brand-new instruments for the stage. According to Strelz, the gear was decided upon by "taking a sort of 'wish list' from a variety of national acts. We asked them what they'd want to have us provide, and purchased the items that seemed to show up most on their riders." Yamaha Recording Custom drums, Marshall JCM1900 and JCM2000 amps and cabinets, Korg Trinity and Kurzweil K2500 keyboards, two Trace Elliot bass rigs, and one Trace Elliot keyboard amplifier were among the instruments chosen. All backline gear was provided by Hoffman Music, Spokane.

SWEATING THE SMALL DETAILS

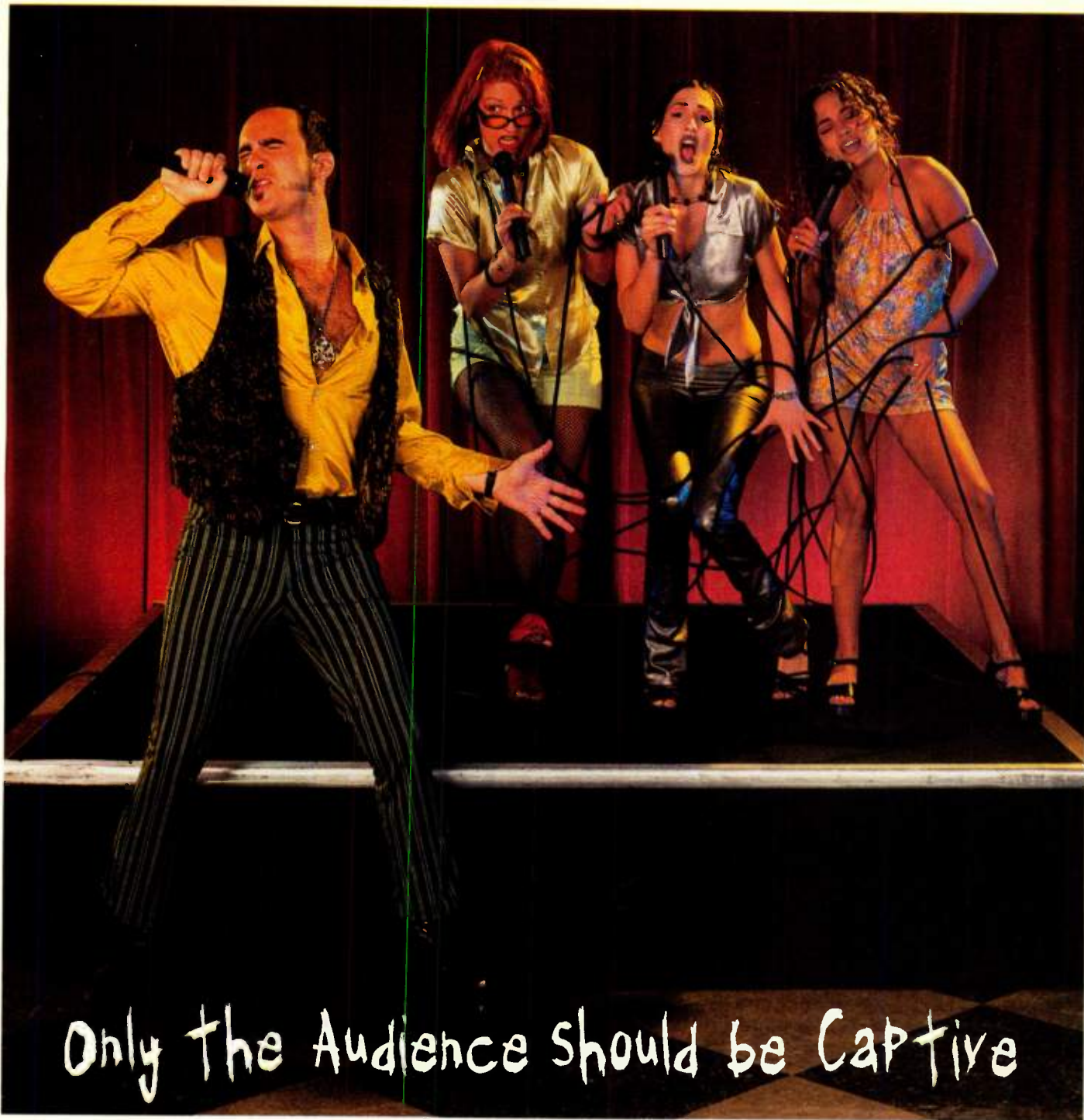
In order to minimize mechanical transmission of sound through mic stands, an acoustically dead stage was constructed. It utilizes 2 x 6 stud walls and 2 x 12's on 16-inch centers for the foundation. On top of that is a 3/4-inch deck, a layer of foam, another 3/4-inch deck, another layer of foam, and then a finish layer of laminate similar to what might be used in a bowling alley. That last layer of laminate is actually not glued down — it just sits on top of the foam and floats (the dance floor is constructed in the same manner). As a result, the stage does not ring at all.

Foreseeing a future with two-way communications between various areas of the club, Cary planned for several comm stations: one at each side of the stage, two at FOH, one at the spotlight platform, and one in the dressing room. "Some people don't realize how important the comm system can be," notes Cary. "But it's not practical for the crew to be running back and forth between the crowd when the room is full. This concept became quite clear to us on opening night when the headliner got locked in the dressing room before the encore, and couldn't get out until someone broke down the door!"

In the original design, Dave told the club they'd "need acoustical treatment to help the room sonically. Initially, it sounded like a gymnasium and we had a real reflection problem. The club came up with the idea of hanging velour drapes on the walls around the entire room, which made a world of difference both aesthetically and sonically. One of the walls was opened up to add more seating. We did notice that the audio drops off when you're sitting in that particular area because it's off-axis from the downfill. Eventually we may have to add some fill speakers. But we'll wait until the mezzanine is built before we do that, because at that time we'll also add some under-balcony fills."

Dave Kenagy reveals that getting Swackhammer's ready to rock "was a total group effort. Cary, Dave Strelz, and our entire Hoffman Music crew really worked hard to make this happen. The beautiful thing about this project was that we had total support from the club ownership in what we were doing. We did have a budget, but they told us to do whatever is necessary to make the room sound good."

Dave Kenagy and Cary Cummings may be reached at at 509-444-4140, or via e-mail: dave@hoffmanmusic.com; cary@hoffmanmusic.com.



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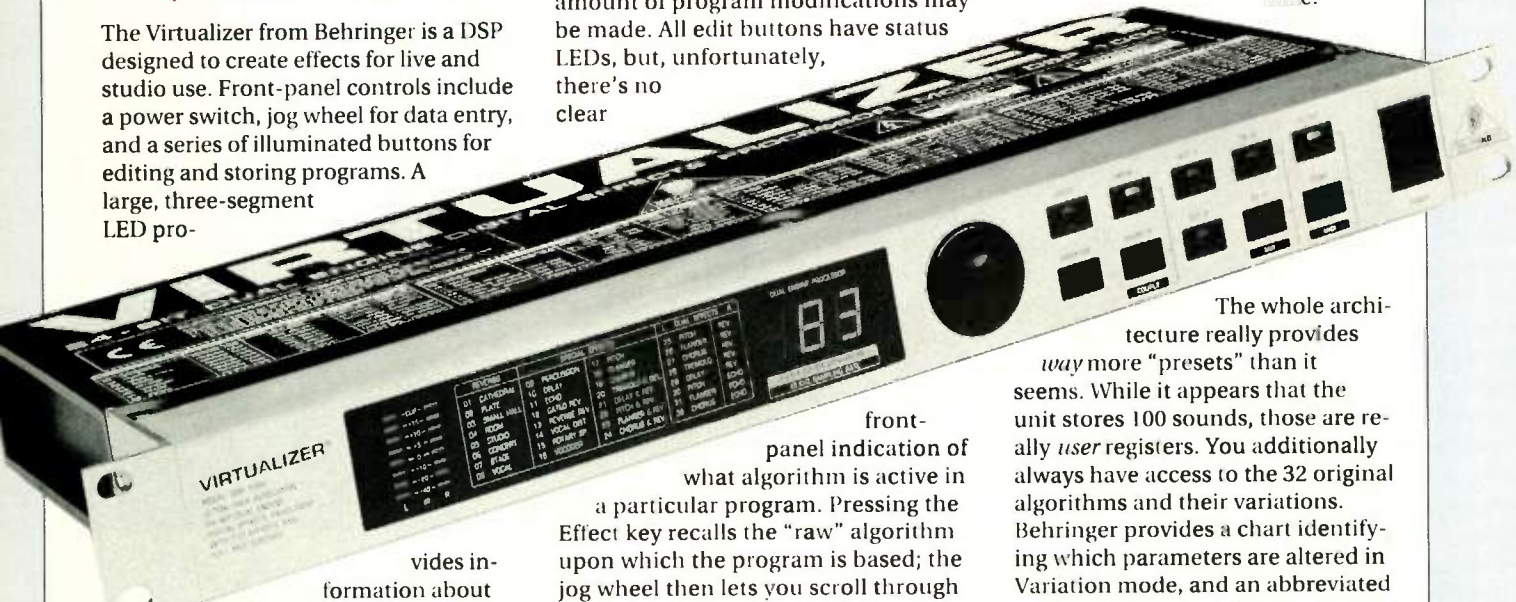
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By **STEVE LA CERRA**

The Virtualizer from Behringer is a DSP designed to create effects for live and studio use. Front-panel controls include a power switch, jog wheel for data entry, and a series of illuminated buttons for editing and storing programs. A large, three-segment LED pro-

vider has limited edit controls, a fair amount of program modifications may be made. All edit buttons have status LEDs, but, unfortunately, there's no clear

gram slot, then hit Store a second time.



vides information about what's going on in the Virtualizer. On the rear panel are 1/4-inch, unbalanced stereo I/Os and a switch that toggles the unit between +4 and -10 operation. We dragged the Virtualizer out on the road and let it bounce around in a truck for a summer tour with Blue Öyster Cult, using it in venues ranging from clubs of several-hundred capacity to outdoor festivals of more than 10,000.

Getting started on the Virtualizer is simple: plug in the I/Os and turn it on. Use the jog wheel to select one of the 100 effect programs. Those who don't like to tweak really don't need to know much more. For those who like to dig in, 32 effect algorithms are built into the Virtualizer. Nineteen of these algorithms perform a single effect, five do multieffects (inputs are routed through two different effects serially), and the remainder perform dual-mode processing (the left and right channels act as independent mono "engines") — allowing you to route one aux send into the left input and a second into the right input for obtaining discrete effects. Although this provides greater flexibility in processing, it also means the effect output is mono.

In spite of the fact that the Virtual-

izer has limited edit controls, a fair amount of program modifications may be made. All edit buttons have status LEDs, but, unfortunately, there's no clear front-panel indication of what algorithm is active in a particular program. Pressing the Effect key recalls the "raw" algorithm upon which the program is based; the jog wheel then lets you scroll through the different algorithms. Hitting Variation allows the jog wheel to scroll different flavors of the same algorithm, though the manual really doesn't do this feature justice. For example, if you call up algorithm 1 (Cathedral) and use the edit buttons, you'll notice that you don't have access to the reverb time parameter — which most folks would consider essential. The way to change the reverb time is to hit Variation, use the jog wheel to audition reverb time variations, and then either edit further or store your work. Storing your edit is very easy: press Store, jog to the target pro-

The whole architecture really provides way more "presets" than it seems. While it appears that the unit stores 100 sounds, those are really user registers. You additionally always have access to the 32 original algorithms and their variations. Behringer provides a chart identifying which parameters are altered in Variation mode, and an abbreviated version of this chart appears on the front panel (very handy).

Further edits are made by pressing the Edit A or Edit B keys. For each algorithm, Behringer has

ROAD TEST

MANUFACTURER: Behringer, distributed in the U.S. by Samson Technologies Corp., PO Box 9031, Syosset, NY 11791. Tel: 516-364-2244. Web: www.samson-tech.com.

APPLICATION: Digital effects unit for stage and studio use.

SUMMARY: Stereo multieffects processor capable of generating reverb, delay, echo, chorus, flange, pitch shift, and other effects.

STRENGTHS: Good bang for the buck; internal power supply; stereo I/O; +4 or -10 operation.

WEAKNESSES: No input- or output-level controls; limited program editing; unbalanced I/O; clumsy user interface.

PRICE: \$249

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predetermined the editable parameters, and you can't change them. Parameter changes are applied to the left or right engine simply by pressing Engine L or Engine R. In a stereo effect, changes to Engine L are automatically applied to Engine R (and vice versa). In other algorithms, such as delay, Engine L and Engine R allow access to discrete delay times (Edit A) and feedback (Edit B). In multi- or dual-effects, each engine accesses a parameter unique to the effect (such as L = delay time and R = reverb time for the "delay and reverb" algorithm). The LED does not

provide the actual reverb or delay time values in these effects. Two additional algorithms provide high- and low-frequency shaping.

So how does it sound? Pretty darn good, with one qualification: you must set gain structure carefully — which is not difficult considering the lack of I/O level controls. Hit the Virtualizer with too small an input signal, and you'll need to crank the return — resulting in a higher noise floor. Don't be afraid to hit "0" on the input meter and turn down the returns to improve S/N.

On vocals we found the plate algo-

rithm to be somewhat murky, though reducing the low-frequency contour can minimize this quality. The small hall program became a favorite, and we used the longer variations of this algorithm to create large spaces. Another favorite was the vocal distortion algorithm, perfect for Eric Bloom's vocal on "See You In Black" from BÖC's recent release (*Heaven Forbid*, CMC Records). In this case, the Virtualizer was patched in the channel insert and a dry/effect mix was created in the Virtualizer (the unit has modes for sidechain or insert operation). The Virtualizer was bypassed until we came to spots requiring the effect, and then it was switched in. There was no audible glitch or gain change, though there is a *very* subtle delay before the unit begins processing. It was instant megaphone, and we loved it. We also used this effect for the Japanese-language announcement in the song "Godzilla."

For drums, the Cathedral algorithm and its variations (longer reverb times) sounded smooth, and although the longest decay times lacked the silky tail of a kilobuck DSP, the Virtualizer held its own.

BOTTOM LINE

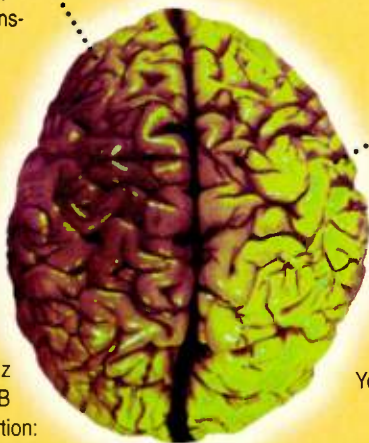
The Virtualizer provides high-quality effects at a very reasonable price. Engineers who require delay- and decay-time readout will be frustrated by the display, but those relying more on their ears won't miss a thing. In a way, the omission of I/O controls is an advantage because it forces you to think about gain structure. Although you can expect to just plug it in and use the factory presets, don't expect to be an editing whiz in an evening. There's no wall wart (thank goodness), and the 100 program slots are plenty in light of the fact that you always have access to the factory set. Our Virtualizer's been on the road for six weeks, and is holding up well, save for a loosened chassis screw (typical for devices that bounce around in our truck). The Virtualizer sounds good and it won't break your bank!

MANUFACTURER'S SPECIFICATIONS

Bandwidth: 20 Hz to 20,000 Hz, +0/-0.5 dB
Maximum Output Level: +16 dBu
Signal-to-Noise Ratio: 98 dB
Converters: 20-bit Sigma-Delta
Sample Rate: 48 kHz
THD+N @ 1 kHz, +10 dBu: 0.01%

left brain

Discrete solid-state class-A topology; Jensen input transformer into FET input circuit.
 Noise: EIN < -129 dBv unweighted, 20 Hz to 22 KHz, 150 Ω termination resistor; Frequency response: 5 Hz to 50 KHz ± 0.5 dB (mic input) 2 Hz to 80 KHz ± 0.5 dB (Hi-Z input); Distortion: CCIR-DFD2 (1K) method = < -72 dBv @ 8V rms into 150 Ω load. (all measurements @ 40 dB gain).



right brain

Silky sound noiselessly dazzles with sparkling clarity & stunning dynamics. Yee-ha.

no brainer

The price: \$1250 for the MP-2 (2-channel). \$1975 for the MP-4 (4-channel). No matter how you look at it, it's the mic pre-amp you've always had in mind.



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owner's manual is the best that I have ever
 and very easy to understand. MK, Santa Monica CA •
 the best part of this unit is its sound quality. RM, Bet
 redible feature set, pristine performance, outs
 instruction. SJ, Lansdale PA • After using the CR1604-V
 how powerful a mixer can be. Great product
 Orlando FL • Love the features, price and size. JH, St
 at mixer. The best for the money and then
 ergus Falls, MN • Finally, a nice, quiet unit with
 tures that a musician can appreciate
 i Mackoids really outdid yourselves
 he best board for our needs. DB, Virginia Beach VA • My
 4-VLZ is loaded with features I like and need. PE,
 rylene seemed to rave about them. Bigger studi
 ommended them. It's perfect — small and tota
 e to cope with pro recording. MW, London England • I am
 y pleased with this mixing unit. Mackie has don
 eat job of providing a lot of features and audio
 ility in a compact unit. BB, Calgary Alberta • I'm an ann
 use your board to record and produce radio sp
 y happy with it. JC, Fallston MD • Great design. JM, Wern
 at features and so compact and durable. FS, Grand
 nks for such a great mixer at such a great price
 ckie rules. ST, La Grange, GA • I love you. From home de
 hart-busting platinum sellers, there is no bette
 urn on investment than the CR1604-VLZ. JS, Pasade
 produce IMAX films and have your mixer in our
 up with an Avid Film Composer 8000. EC, Santa Barba
 CR1604-VLZ is absolutely the best I've ever hea
 sound quality. WH, Green Forest, AB • A quality product
 price. PV, San Francisco, CA • As an electric
 by the mixer's ruggedness and almost perfect human interface. JH, Rak
 We do hip hop and jungle with booming bass. The CR1604-VLZ sounds p
 CW, Vienna Austria • Incredible quality, low noise and high headroom for a pr
 at this price. AD, New York NY • I can honestly say that the CR1604-VLZ is eas
 the best desk out there. Sound quality
 a drum submixer. After numerous con
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 sounded, our crew replaced
 sounded better. DG, Winnipeg, Manitoba
 console has everything and more. You guys know what us musicians r
 Did I mention clean sound? MG, Plymouth MI • Love my CR1604-VLZ. You guys
 did yourselves on this one! TM, South Lake CA • Great feature set. Can't think
 anything else it would need. Great job. MA, Westlake OH • A great mixer. We

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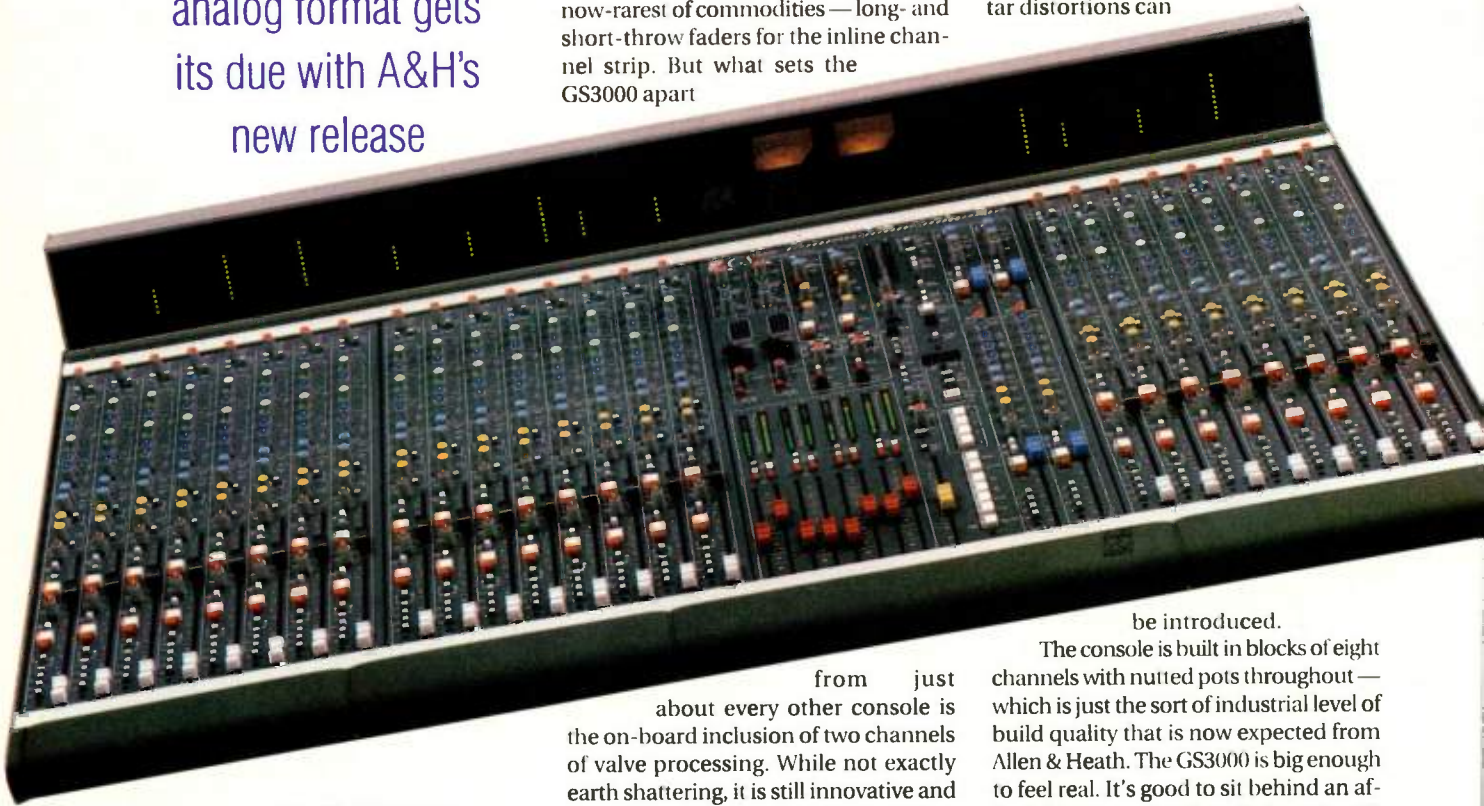
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Allen & Heath *GS3000* Mixing Console

The now-neglected analog format gets its due with A&H's new release

Strong points include new mic pre-amps, a new EQ circuit, which is remarkable for its flexibility, and that now-rarest of commodities — long- and short-throw faders for the inline channel strip. But what sets the GS3000 apart

compression, while the instrument level transcends the concept of DI and enters an area where constructive guitar distortions can



BY ZENON SCHOEPE

At a time when so many manufacturers are turning their attentions to digital matters, it is refreshing to see an all-new analog music-recording console taking a bow. The GS3000 is no rehash or scaling up of an existing model; it's a bold new look at the role an affordable analog console can play when it plays to its strengths.

Thus we are presented with a traditional 8-bus inline desk that is available in 24- and 32-channel sizes with stereo inputs, MIDI muting, MIDI Machine Control, and the curious inclusion of two valve [tube] channels. Allen & Heath should be applauded for continuing to support an area of the market that has been rather neglected of late. If you're looking to spend this sort of money on an analog desk offering loads of mic inputs, all with a different slant, then this, my friends, is one of few new offerings.

from just about every other console is the on-board inclusion of two channels of valve processing. While not exactly earth shattering, it is still innovative and much more than a gimmick. It's also a practical solution for its target market that adds quantifiable value. This provides a mic/line amplifier with the double triodes working in differential mode and a single-ended mode for a guitar input to replicate the valve behavior in guitar amps. In the mic/line mode, you can work the circuit comfortably into

be introduced.

The console is built in blocks of eight channels with nutted pots throughout — which is just the sort of industrial level of build quality that is now expected from Allen & Heath. The GS3000 is big enough to feel real. It's good to sit behind an affordable proper analog desk again. All I/Os, with the exception of some 2-track phonos and the TRS channel inserts, are balanced on XLR or TRS jacks. Inserts are also provided on the eight groups.

Each channel has a gain pot, phantom power switching, phase reverse, line selector, and a 4-band EQ section that can be split HF/LF and twin parametric



LAB REPORT

MANUFACTURER: Allen & Heath, 8760 Sandy Parkway, Sandy, UT 84070. Tel: 801-568-7660. Web: www.allen-heath.com.

APPLICATION: Project and commercial recording studios.

SUMMARY: Eight-bus inline analog desk with stereo inputs, six auxes, MIDI muting, MMC, and two tube channels.

STRENGTHS: Lots of channels; lots of great EQ; long and short faders; tube channel variety.

WEAKNESSES: None for the money and market.

PRICE: 24-channel, \$5995; 32-channel, \$6995

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mids between the channel and monitor paths. You're offered ± 15 dB at 12 kHz and 60 Hz shelving, and 2 dB better each way on the mids, which cover 300 Hz–18 kHz and a woofer-unseating 18 Hz–1 kHz. Q for these bands is fully variable from 0.6 to a not-too-sharp 2. I'm still not convinced about super-wide-ranging sweepable bands, as I find resetting a problem. The GS3000's arrangement, though, does boast immense flexibility by being fully parametric in the midranges. It's decidedly modern-sounding, with lots of low- and high-end activity if you need it, but it's easily up to corrective work if that's why you need it. It is, in fact, a posterously well-featured EQ for this sort of money — especially when you think how many channels you're getting. It's class-leading in this respect.

Aux arrangement is neat in providing six mono auxes accessible from four pots. The first two are globally switched pre/post for channels, while the remainder are post-fader and can be flipped in pairs between channel and monitor paths with an additional switch changing the assignment of two of the pots between auxes 3-4 and 5-6.

An XFX switch takes the source for the short fader from the long-fader output, which is useful in mixdown as it uses Mix B — the GS3000 provides two main stereo busses that can be split for main stereo and stereo monitor mixes — as a postfade stereo effects send. Mix A is the main stereo bus, with Mix B taking the monitor bus and able to be summed into Mix A on a switch in the main section.

Each channel also has a Group/Direct switch for doing what that suggests in the context of an inline. Paired 8-bus routing can be switched between the monitor and channel paths. That basically sums up the main features of the GS3000 input strip.

MIDI capabilities offer automated muting on channel, monitor, stereo channels, and aux masters 5 and 6. Four mute groups are supplemented by 128 additional patches and include Safe status for channel and monitor mutes. Operation is simple, and you activate patches with Up-Down keys and a Recall switch or via external MIDI command. Each mute corresponds to a MIDI note so you can run the muting from a sequencer. More surprising is the inclusion of MMC transport keys, arranged unnaturally in a column, and track record arming is performed by pressing the relevant channel Mute. The same strip section houses the Solo-in-Place selector complete with Safes, but there is no solo trim control.

All frame sizes come with four stereo

input channels — two basic and two fuller featured. The more elaborate stereo input channels have 4-band, Q-less EQ, gain control, six-aux access, and full routing, while the more basic stereo inputs retain only two auxes, input level switching, Mix A-B switching, balance, PFL, automated mute, and a short fader.

A cluster of eight long-throw faders handle the group functions, each with individual AFL, and either mono or stereo routing to the main stereo output, and these work in conjunction with corresponding bargraph metering. Group output levels can be switch-selected for $-10/+4$ operation globally. The main stereo bargraph meters can be supplemented by a meterbridge to display channel or monitor paths.

The master section is completed with aux masters, each with AFL plus a "blending" function between auxes 1-3 and 2-4, and two separate studio outputs. Each can draw from control room, Mix A, Mix B, and an aux as its source, has a nonautomated mute, and AFL plus a level pot. Either of these studio sections can serve as an aux master output when the previously mentioned XFX facility is activated.

You're then into a two-frequency oscillator routing to the groups, and talkback through a built-in mic also going to the groups. Three 2-tracks can be connected, with dubbing switching incorporated, and the lot goes out via two pairs of monitors via mono switch, level control, and mute switch.

For all this, it's the presence of the two valve channels that has drawn the most attention to the GS3000. I'll start by explaining that the two identical valve channels in question should be regarded as patchable processing commodities that have to be physically plugged in to and out of. At the back of the desk you'll find each valve channel's connectors for mic (XLR), line, and instrument inputs plus a TRS socket for patching the output of the valve section into any channel insert. Look at the two tube channels as patchable tube front ends.

Each valve input has phantom power, a wide-ranging gain pot, line selector, guitar mode selector with associated single-band bell EQ, a high-cut switch, output level pot, and PFL. However, central to it all is a chicken-headed pot controlling valve drive, which works in conjunction with a tricolor LED to give an indication of how hard the bulb is being made to work. What you have here is an alternative means into a channel that lessens the need to buy tube

outboard. On it's best behavior for mic and line signals, you can hit valve cliché compression without too much trouble, as balancing the input gain against the valve drive control can range all the way down from noticeably compressed and thick to seemingly nonexistent. You can fatten a vocal or a drum track quite effectively by simply passing them through here and beefing them up with a tad of squash. Plus, the high-cut switch is there to smooth out the top end, if you want it even more rounded.

Plug in a guitar and the personality changes. You can go to pretty hefty overdrive and benefit from the guitar-mode-only swept 120 Hz–6 kHz EQ with ± 10 dB of boost to add that little extra honk — particularly as it influences before the signal hits the glass. On super-saturated settings I wouldn't say it rivals the best dedicated guitar valve processors, but it's easily on a par with any budget outboard with valves in it that takes instrument level signals. Clean-to-middle sounds are its *forte*.

In order to get the most out of the valve channels, you'll have to have your patchbay well sorted out, if you plan to avoid frequently scampering around underneath the desk. With a bit of thought, it is possible to get a valve into just about most signals that are going through the desk, although with only two tube channels to play with, the tracking stage is the place to do it. Of course, you'd also be free to take keyboards and just about anything else through these sections.

There are many instances where a digital desk offers benefits that an analog equivalent could never match, but at the same time there remain numerous instances where people just want to be able to record 24 mics in real-time cheaply. In such cases, the choice has become radically reduced, and the intended task largely impossible on any of the digital desks that weigh in anywhere near the sort of money we are talking about here.

What Allen & Heath has done is redefine the affordable analog music recording console and shown what can now be achieved with careful production engineering. You've got to like it — good solid performance front to back, dead quiet, nice mic amps, and class-leading EQ. Throw in MMC, automated muting, lots of inputs, some stereo inputs, and the odd valve to give you a different palette of possibilities, especially on vocals, and there's nothing to argue about. Most importantly, in the face of digital compactness and intelligence, it's still a remarkable value for the money. Here's a novelty then: a really good, affordable analog console, new for 1998.

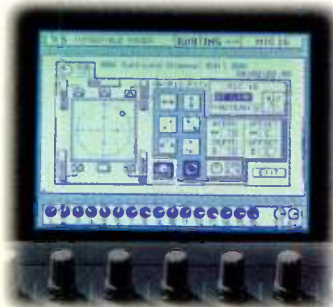


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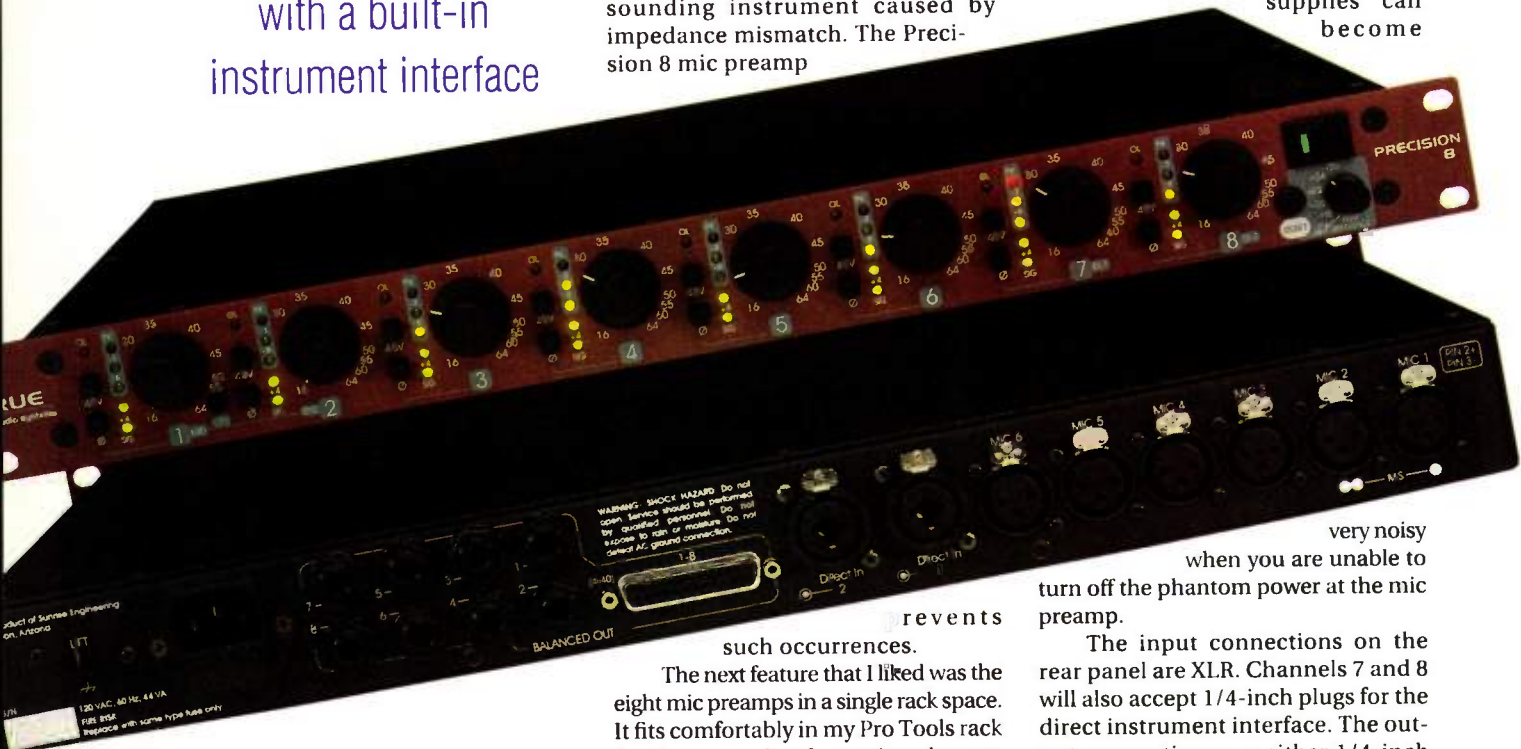
CIRCLE 85 ON FREE INFO CARD

TRUE Audio Systems Precision 8 Mic Preamp

Take a look at this 8-channel mic pre with a built-in instrument interface

the neighborhood of 10,000 ohms. The reason I mention this is because I often see synthesizers plugged directly into a mic preamp without a direct box. The sonic result is a thin-sounding instrument caused by impedance mismatch. The Precision 8 mic preamp

clipping reference level to match the recording device you are feeding, and a separate phantom power switch for each mic preamp. Some condenser microphones with their own power supplies can become



BY ROGER NICHOLS

Microphone preamplifiers are difficult to review because they just lie there and do nothing. They just take your microphone signal and amplify it up to some usable recording level so you can use up as many bits as possible. Then you forget about them.

A few months ago I had the opportunity to use the new TRUE Audio Systems Precision 8 microphone preamp. The feature that initially interested me was the built-in instrument interface (on channels 7 and 8), or "direct box," that enabled you to plug an electric guitar or keyboard directly into the mic preamp without an additional box. A professional balanced microphone usually has an impedance matching requirement of around 150 ohms, while a guitar pickup or synthesizer requires an impedance match in

such occurrences. The next feature that I liked was the eight mic preamps in a single rack space. It fits comfortably in my Pro Tools rack for direct recording from microphone to hard disk. Each input has a five-segment meter on the front panel to monitor levels. There is a master control to set the

very noisy when you are unable to turn off the phantom power at the mic preamp.

The input connections on the rear panel are XLR. Channels 7 and 8 will also accept 1/4-inch plugs for the direct instrument interface. The output connections are either 1/4-inch balanced phone plugs or XLR connectors on a snake that is attached to the rear panel by a DB25 connector.

EQ LAB REPORT

MANUFACTURER: TRUE Audio Systems, 5005 N. Fort Buchanan Trail, Tucson, AZ 85750. Tel: 520-299-3351. E-mail: sunrise@primenet.com. Web: www.spottedpeccary.com/true/.

APPLICATION: Location or studio recording.

SUMMARY: Solid-state 8-channel microphone preamp with built-in M-S decoding and two instrument direct inputs.

STRENGTHS: Compact single rack space holds eight preamps; two on-board DIs and separate phantom power switch for each preamp; excellent transient response; on-board M-S decoding.

WEAKNESSES: Level controls could be detented for repeatability, but other than that, this unit has no weaknesses.

PRICE: \$2495

EQ FREE LIT. #: 146

Cool Edit Pro *Digital Audio Editor*

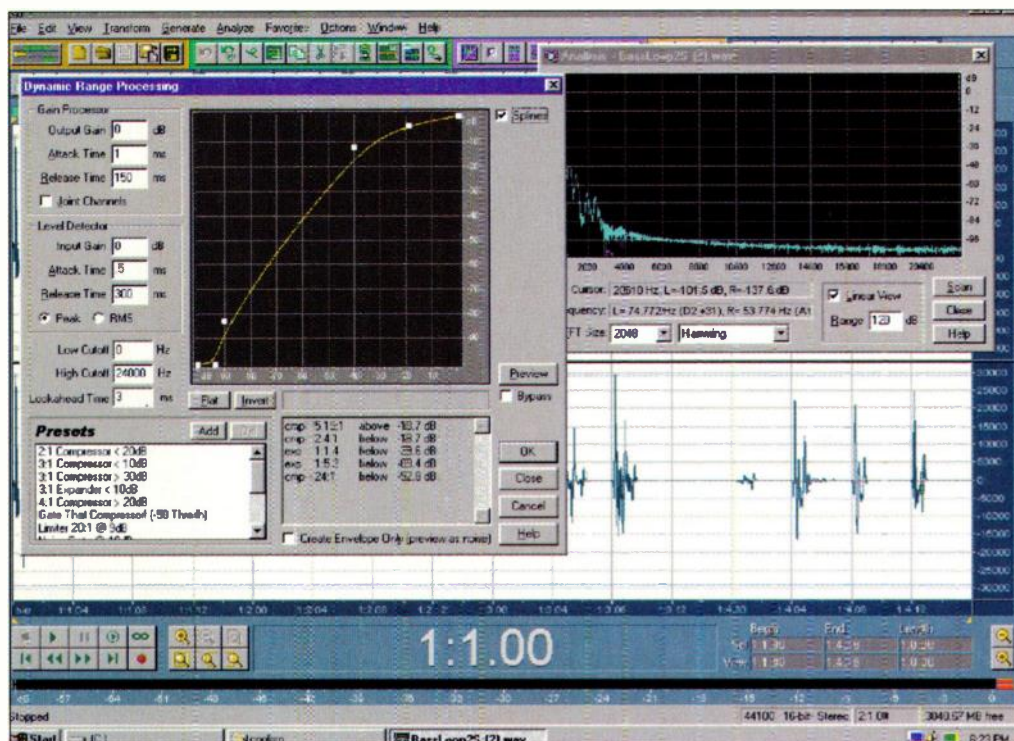


FIGURE 1: You can just see the waveform peeking out from the background. The front-most window is a compressor that adds compression at high levels and expansion below -90 dB. The Frequency Analysis window (upper right) shows the signal's spectral response.

The popular digital audio editor adds multitrack capabilities and a few more surprises

BY CRAIG ANDERTON

Cool Edit has been a popular stereo digital audio editor for Windows because it works very well, especially given the price. Cool Edit Pro (CE Pro) now adds multitrack capabilities to the core editing software; the program continues to maintain Cool Edit's excellent price/performance ratio and adds a few new twists.

THE BASICS

CE Pro delivers 64 tracks, using a background premixing technique (see sidebar) that doesn't require a heavy-duty machine — CE Pro will

actually run on a 486 with an IDE hard drive.

There are instances, however, where throughput matters. First, CE Pro's wave editor accepts DirectX plug-ins, and processor-hungry effects require CPU horsepower. (Unfortunately, you can't use DirectX on the multitrack screen, nor chain effects; you apply effects in the wave editor, then transfer the processed file to the multitrack window.) Second, although each track in CE Pro can feed its own output (multiple I/O board owners, take note), using more outs (or ins) generates additional disk premixes, which need a faster system. Typically, a Pentium Pro 200 with a fast IDE drive can handle eight individual ins and outs. Finally, the background premixing goes faster with faster CPUs (a small bar meter indicates premixing progress).

EDIT LAND

A button switches between the Edit and Multitrack views; let's start with editing (fig. 1). Cool Edit has evolved for many years, and CE Pro supports 16- or 32-bit file resolution, with 32-bit internal processing. All common DSP functions (many with previewing, but none

EQ LAB REPORT

MANUFACTURER: Syntrillium Software, Box 62255, Phoenix, AZ 85082-2255. Tel: 602-941-4327. Web: www.syntrillium.com.

APPLICATION: Digital audio editing and multitrack hard-disk recording.

SUMMARY: Cool Edit was already one of the top digital audio editors; the pro version adds multitrack and DirectX capabilities, along with about a dozen additional effects.

STRENGTHS: Editor accepts DirectX plug-ins; system handles multiple I/O; supports multiple file formats and batch processing; punch take history facilitates picking the best overdub of a series; mature, quality DSP with 32-bit resolution.

WEAKNESSES: Confusing snap markings; no scrubbing or loop recording; doesn't generate timecode; somewhat buggy in multitrack view.

SYSTEM REQUIREMENTS: 486 minimum (Pentium recommended), Windows 95/98 or NT 4.0, 16 MB RAM, 6 MB hard-disk space, VGA display, full-duplex sound card.

PRICE: \$399

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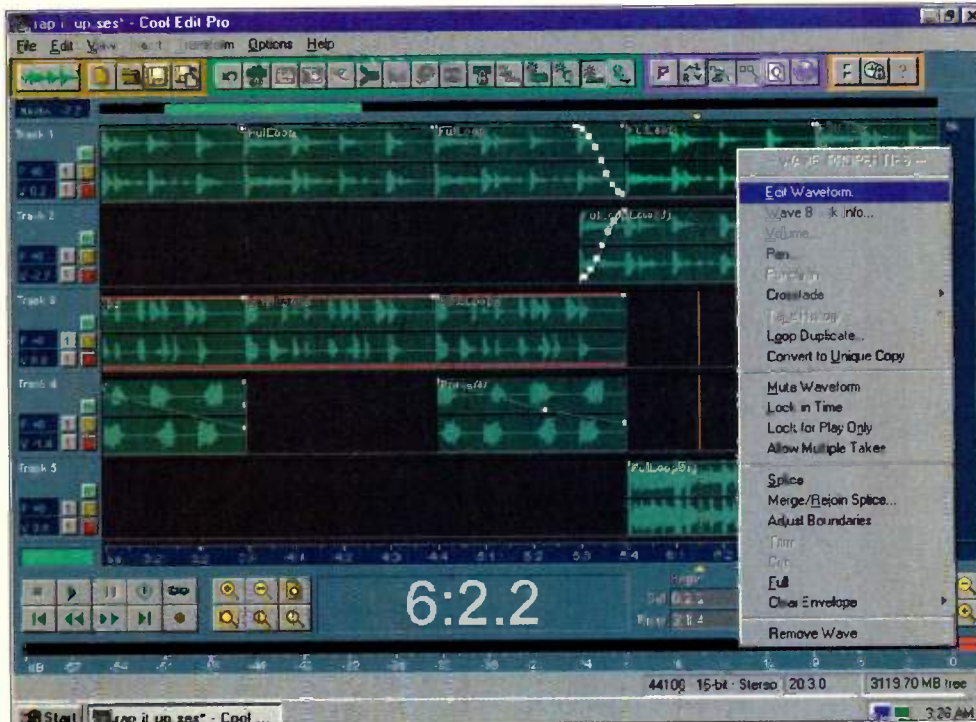


FIGURE 2: Five tracks from the Multitrack view. Note the crossfade in the top two tracks and how right-clicking on a segment of audio brings up a menu of useful functions.

are real time) are present, including amplitude processing, delay and reverb, filtering, noise reduction, and time/pitch stretch. But within these categories there are some interesting variations — noise reduction, for example, comprises de-click, de-hiss, and restore clipped audio. Filter options include the expected (parametric and graphic) as well as “scientific” filters (such as Butterworth and Chebychev responses) and a very flexible FFT-based filter.

Delving further into esoterica, there’s distortion, convolution, and even (gasp!) brainwave synchronizing, which, in a nutshell, modulates waveforms in a way related to brainwave frequencies. Want more? How about tone generation (basically, a decent additive synth screen), or a screen called “music,” where you can jot down ideas using traditional notation and preview them using a sound card’s MIDI synth. All of these functions are available on easily customizable toolbars, and presets can be saved.

There are also some utilitarian functions. These include markers and view saving, information embedding in WAV files (artist, title, copyright info, etc.), sample-rate conversion (including flexible dither options for playing back 32-bit files in a 16-, 20-, or 24-bit world), playlist with repeats for each

cue, frequency analysis, scriptable batch processing, and file conversion. Supported file formats include .wav, .au, .vce, .vox, .ra, .smp, .voc, .vba, .pcm, .sam, .iff, .aif, and .snd. If you want to batch convert 400 .aif files to .wav with a little high-end boost and a taste of reverb, go for it.

For the rhythmically-inclined, rulers are available for both the Edit and Multitrack views in bars:beats:ticks as well as SMPTE drop frame, custom SMPTE frame rate, minutes:seconds:100ths of seconds, or samples. Editing-wise, there’s unlimited undo/redo, along with an undo history. Some options are unusual; for example, you can paste and mix, but you can also modulate one waveform with another. Looping fans will enjoy the Find Beats function, which simplifies looping individual files by finding particular beat points.

Even the metering is cool, as you can compensate for DC bias from sound cards, show the dynamic range spread between low and high values, and change the meter range.

MAKING TRACKS

The Multitrack view (fig. 2) is pretty straightforward: drag and drop files into the tracks from the desktop, insert them from the waveform editor, or in-

sert or drag from a waveform list, which lists all the waveforms used in a session. You can import files into either the waveform list or editor.

You can access panning and volume in real time, either through a dialog box or “rubber band” automation. An additional master level and pan for each track, coupled with mute, solo, and record, round out the main complement of controls. Crossfades are available between digital audio blocks, but you can also splice or adjust the region boundaries (to zero crossings or not, as desired). Looping, zooming, and metering are all well implemented. There are even two effects unique to multitrack view because they require two input waveforms: vocoder and envelope follower, both of which are a lot of fun.

Other multitrack editing functions are “splice” (cuts digital audio blocks), snapping to ruler divisions or

continued on page 148

ABOUT BACKGROUND PREMIXING

Background premixing made its debut in 1996 with Metalithic’s Digital Wings for Audio. This program achieved 128 tracks by building a 2-track premix for monitoring; no matter how many tracks were recorded, the hard drive only had to pull two tracks from disk. Cool Edit Pro uses the same technique to obtain 64 tracks, and Ensoniq’s PARIS system uses a variation on premixing to provide 128-track playback from an essentially 16-track recording system.

Background premixing is nonetheless a true multitrack technique, as all files are stored undisturbed on disk should you want to modify them — the premixing is just for monitoring purposes. The tradeoff is a delay as the system generates the premix; Cool Edit does background processing to allow playback before the premix is complete, although adding more tracks or changing multiple parts increases the delay.

Even the Pros Get Confused About Compression

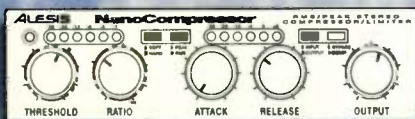
Quick...does a kick drum require a higher or lower compression ratio than a bass guitar? When you compress an entire mix, should you use peak or RMS compression? What curve sounds better on lead vocals...hard knee or soft knee?

If this is confusing to you, don't worry...you're not alone. Although compression can be the key element to make your multitrack recordings sound their best, it's also one of the most misunderstood - and misused - tools in a recordist's arsenal.



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you make the most of it, we've created the "Beginner's Guide to Compression", a free booklet you can get at your Authorized Alesis Dealer.



The Alesis "Beginner's Guide to Compression" is a comprehensive tutorial on the basics of compression, including specific setups for different vocal and instrument sources. The diagram above is a recommended NanoCompressor setting for lead vocals.

For more information about the NanoCompressor, see your Authorized Alesis Dealer or call 800-5-ALESIS. NanoCompressor is a trademark of Alesis Corporation.

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This guide puts the language of compression into terms that are easy to understand, and gives you diagrams for quick, simple compressor settings for a variety of instrument and vocal sources.

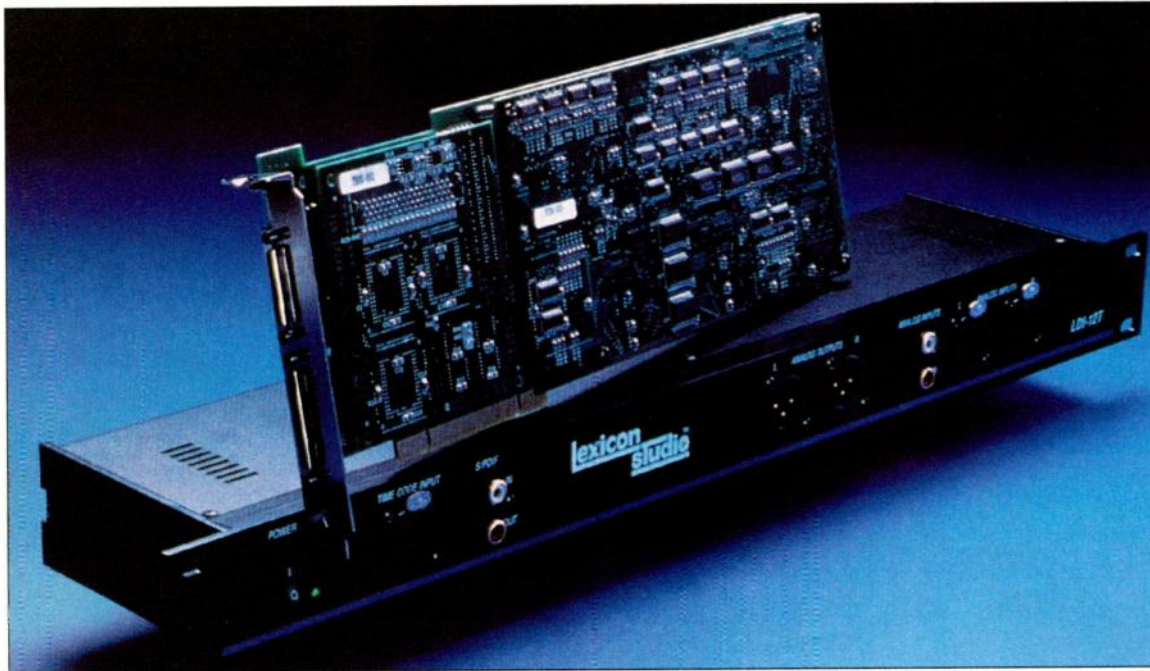
Just because compression takes a little practice to master doesn't mean you shouldn't benefit from its power. Alesis wants to make it easy for you with the NanoCompressor and the "Beginner's Guide to Compression". Stop by your Alesis Dealer and pick them both up today.



The "Beginner's Guide to Compression" shows you how compressors can automatically control the volume level of a voice or instrument so that it blends perfectly with the rest of the music.

ALESIS

Lexicon Studio



Lexicon enters the world of hard-disk editing

BY CRAIG ANDERTON

Just when you thought the hard-disk recording system population couldn't possibly increase any more, there's a new kid in town. This kid, though, comes from a very good family: Lexicon. While renowned for their reverbs, Lexicon's development of the Opus system in the early '90s gives them a substantial background in hard-disk recording, too. When Lexicon speaks, people listen...so let's audition their latest.

SYSTEMATIC APPROACH

The Lexicon Studio (LS for short) consists of a cross-platform PCI processing card that plugs into your computer, audio interface, and software. LS was tested with a 300 MHz Pentium II/128 MB RAM computer loaned by Lexicon for review purposes (Mac drivers are slated for intro-

duction in the 4th quarter). Although I didn't install the original software, I did re-install a software update, and it installed painlessly.

Unlike systems such as Pro Tools or PARIS, Lexicon does not include

the pair are extremely well integrated. While I did experience a few freezes, it was hard to tell if the problem was due to the beta drivers, Windows, or the application running on the LS.

integrated software (except for a demo version of Cubase Score with some audio features and a control panel applet), opting to let you choose your own. Currently, LS works with programs that support standard Windows drivers (ACID, Wavelab, Samplitude, Sound Forge, Cool Edit Pro, etc.). More importantly, though, LS supports Cubase VST with ASIO drivers that allow for multitrack recording and playback;

EQ LAB REPORT

MANUFACTURER: Lexicon, 3 Oak Park, Bedford, MA 01730-1441. Tel: 781-280-0300. Web: www.lexicon.com.

APPLICATION: Provides high-quality I/O and reverb for digital audio editing and multitrack recording programs.

SUMMARY: The Lexicon Studio is off to a good start, as demonstrated by its integration with Cubase VST and high sound quality with 2-channel editing software, but awaits further support to reach its full potential.

STRENGTHS: Dual, cascadable PCM-90 reverb engine; built-in ADAT optical I/O with ADAT sync connections; 24-bit converters; audio is kept out of the computer; cross-platform operation slated as an update; works with a wide variety of software; WAV and ASIO drivers; format conversion and several sync options.

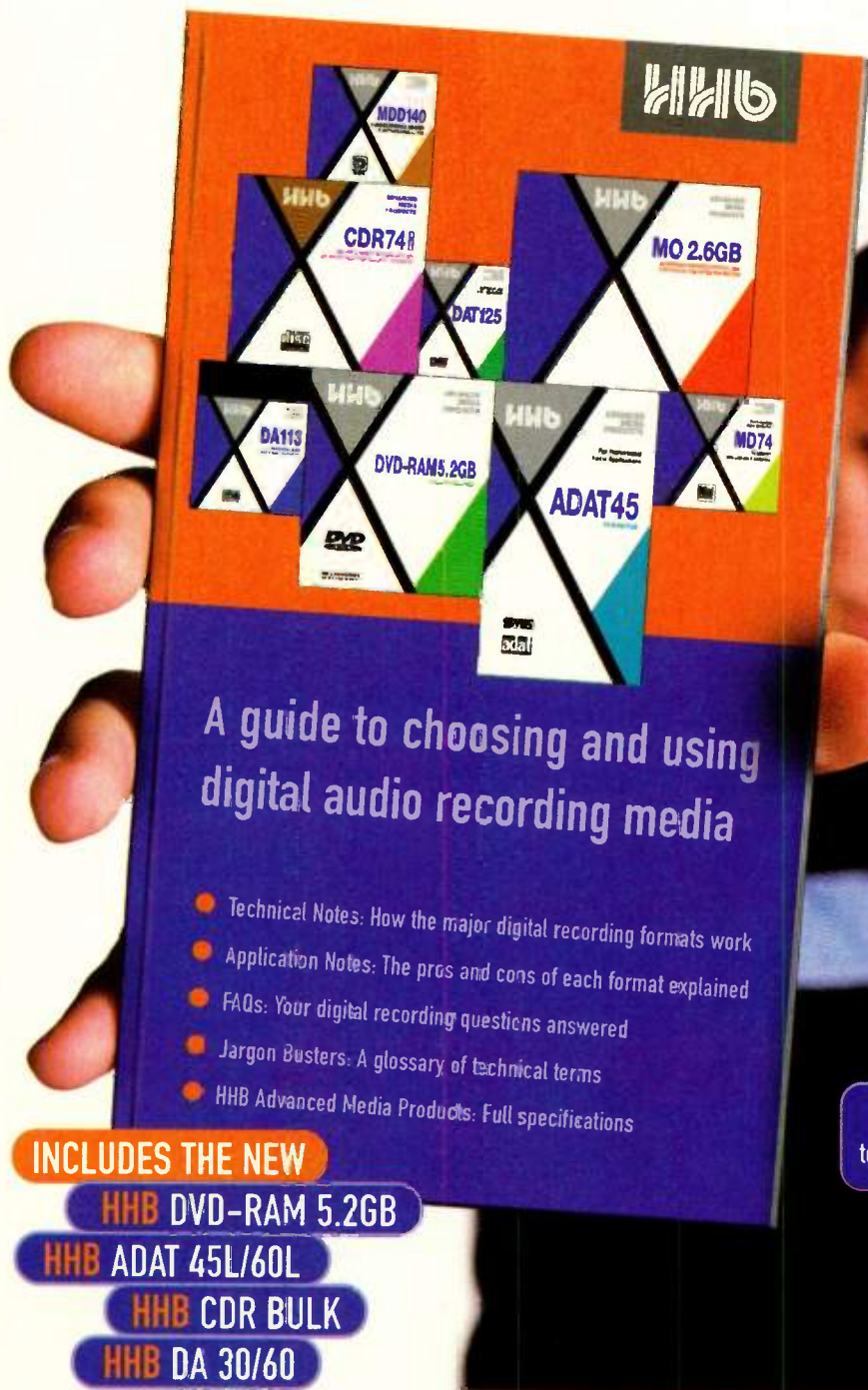
WEAKNESSES: Only stereo analog ins and outs; no 1/4-inch phone jacks for audio; software costs extra; no MIDI interface; dependent on other manufacturers to develop software that takes full advantage of the system.

SYSTEM REQUIREMENTS: 200 MHz Pentium for use with Cubase VST, fast SCSI or IDE hard drive, 64 MB RAM, Windows 95/98.

PRICE: Studio 12T system (Core-32, PC-90, and LDI-12T), \$2999; with LDI-16S instead of LDI-12T, \$3499. You can omit the PC-90 to save about \$1000; other permutations and combinations are possible.

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The hardware-intensive design places relatively few demands on a computer when running LS by itself. However, programs that accept plug-ins require some horsepower to run the plug-ins.

GETTING TO THE CORE

The Core-32 PCI card offloads most of the tough audio work from the CPU. It has 24-bit architecture and can handle 32 voices maximum (inputs and outputs; with a fast computer and high-throughput drives, it can play back 32 tracks simultaneously). Sync-wise, as a slave, it auto-detects the incoming timecode frame rate and type; for word clock, the LS can be either master or slave. Both 44.1 and 48 kHz sampling rates are supported.

The Core-32 accepts the PC-90 daughterboard, which is essentially two PCM90 reverb/digital signal processor engines. Each has five algorithms (chamber, concert hall, inverse, room, and ambience) and includes 50 presets (100 total). Because it's an upgradeable architecture, new algorithms/presets are possible. In any event, the PC-90

THINGS TO COME

The LS is clearly designed for expandability. The LDI-16S, an alternative to the LDI-12T, is a 3U-rack expansion box that provides eight channels of +4 XLR analog I/O and eight TDIF channels. You can stack two LDI-16S modules to double the I/O or run it with an LDI-12T. The LDI-16S will accommodate any combination of three option packages: eight channels of AES/EBU digital I/O; eight channels of ADAT I/O including 9-pin sync; or the STC-1 "post" option (LTC or VITC read/write, window burn, house sync, and a general-purpose interface that opens and closes relays to trigger external devices). Adding these options can increase the audio channel count to 32.

Another advanced feature is the TBUS, a 24-bit, 288-channel "digital audio highway." Adding a TBUS expansion card to the Core-32 will allow adding a "skybus" to interconnect multiple cards.

On the driver front, WAV drivers (which will improve the driver performance for standard cards) are planned, as are NT and Macintosh drivers.

Finally, Lexicon is known to be working with other software manufacturers to provide software with the same degree of integration as Cubase VST. Check Lexicon's Web site for the latest news on compatibility, as well as software updates and tips.

solves the dilemma of whether to use a great-sounding reverb plug-in that hogs your CPU or one that sounds less wonderful but doesn't bring your computer to its knees. (Because the PC-90 does reverb in hardware, you get that wonderful, airy Lexicon reverb sound with-

out taxing the CPU.)

Graphically, each "virtual front panel" even looks like a PCM90, but follows the rack-mount paradigm too slavishly for my tastes. You have to click through the 24 reverb parameters, in groups of three, using page < and > but-

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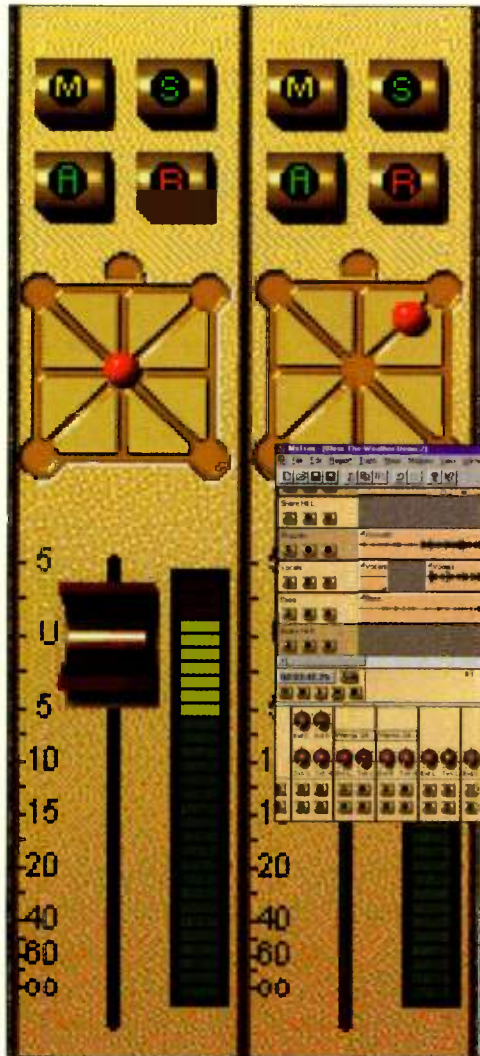
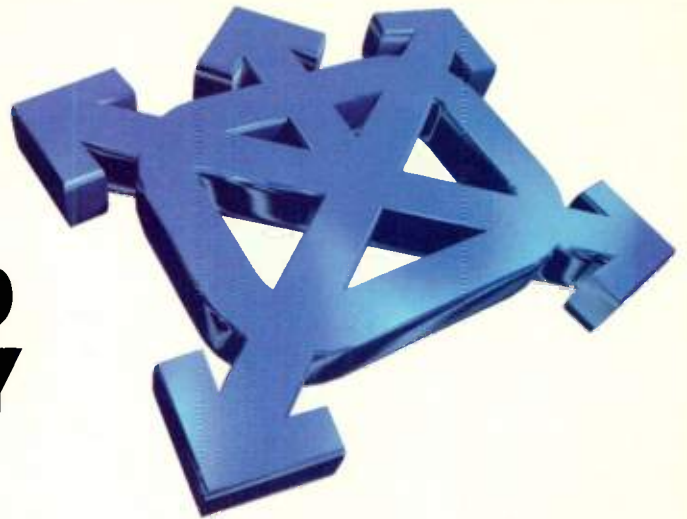
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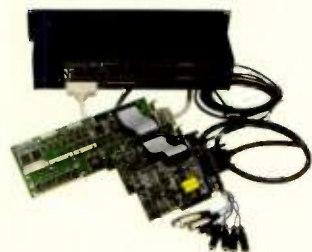
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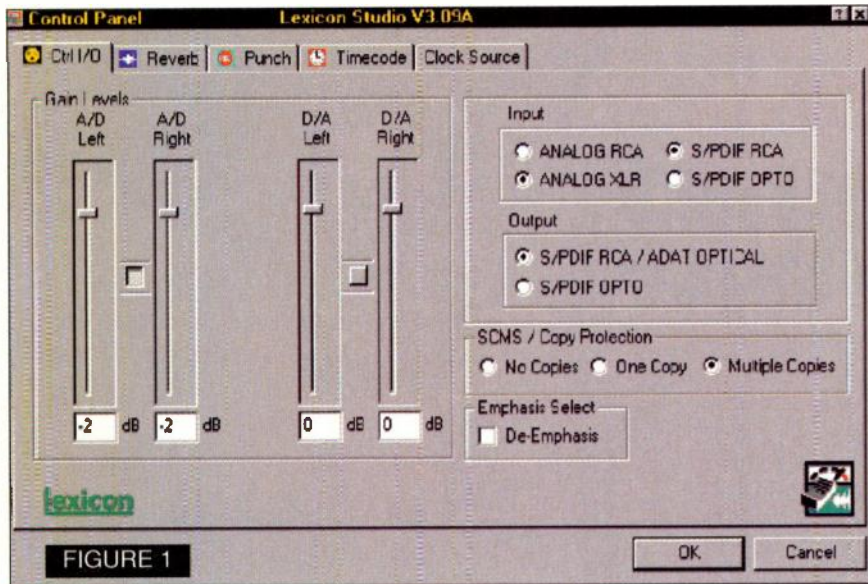
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tons. You can't type or mouse-drag different values; either use the inc./dec. buttons or the virtual data wheel, which requires that you actually "turn" the knob (I'd prefer simply dragging up to increase the value and dragging down to decrease it).

Realistically, though, the reverb sounds wonderful, and that's the important part. You can also run the two reverb engines in series to "construct" bigger reverbs. Although the reverb "normals" within Cubase as a plug-in connected to the aux bus, you're not

locked into that. In fact, the LS Control Panel software (fig. 1) lets you assign each channel for both reverbs between any two inputs and outputs, which turns your computer into essentially a dedicated dual PCM90.

THE LDI-T12 INTERFACE

This 1U rack box's front-panel features S/PDIF (electrical) I/O, XLR dedicated timecode in, +4 XLR balanced and -10 RCA unbalanced stereo analog in, and +4 XLR stereo analog out (both ins and outs use 24-bit converters). The back panel has RS-422 (9-pin) for Machine Control, word clock in (BNC connector), optical I/O selectable between ADAT or S/PDIF, and ADAT 9-pin connectors for ADAT sync in and out. There's also a multipin connector for the cable that connects back to the Core-30 card.

All in all, the audio interface sounds as good, if not better, than similar high-end digital audio recording systems. However, the lack of multichannel analog I/O limits your options with outboard analog gear, such as dedicat-

continued on page 150

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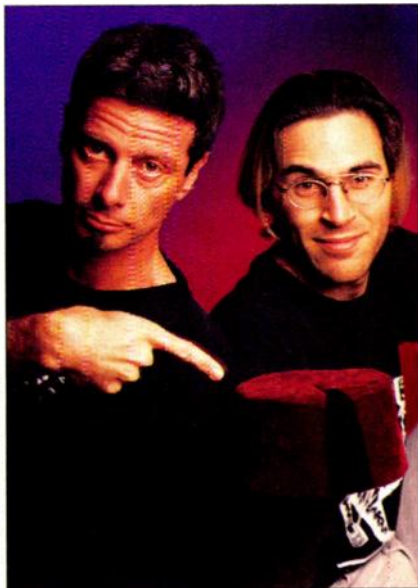


PHOTO BY STEVE JENNINGS

A close look at Xing's MP3 Encoder

BY JON LUINI
AND ALLEN WHITMAN

Welcome to the end of the beginning! This column marks two years of pithy FezGuy Internet audio opinions, resources, and educational amusements. In the past two years, music on the Web has finally begun to sound like more than an afterthought. The quality of streamed audio files is improving and tools to digitize and compress music are becoming easier and (somewhat) more efficient. To mark this auspicious occasion, let's take a look at a next-generation MP3 encoder from Xing Technology.

We'll encode a WAV file (created in Cool Edit from an analog output of a portable DAT player) at different bit rates and play it back. (See column #3 at www.fezguys.com or the January '97 issue of *EQ*.) This will be a subjective listening test. We've elected to use common or garden-variety, tiny, little powered computer speakers. Our exhaustive demographic research says that's what most people use. They are Labtec CS-150's and are in-between both tiny and little.

Because this encoder is still in the beta stage and is Windows-only (c'mon

people!), we'll do our subjective processing and listening test on a Windows NT machine with dual 200 MHz Pentium processors and a crappy little 13-inch color monitor (it brings new meaning to the term "lo-rez") we found in the closet. We'll perform these tests in the secret underground FezLab at Grok House, somewhere on the Central California coastline.

The Xing MP3 Encoder can be purchased securely and downloaded at: www.xingtech.com/products/mp3encoder/ for \$19.95. The Xing Web site is slightly confusing. They must still be integrating this new suite of tools. While looking for links to the MP3 software, we kept finding ourselves at their MPEG 2 or LBR (Low Bit Rate) products.

The Xing MP3 Encoder is based on the Xing MPEG Encoder engine and features a stylish GUI. What the hell do we mean by these terms? Just this: the "engine" or "back end" (no jokes please) is the actual program (comprised of lines of code) that instructs an application to perform the tasks you assign it through the on-screen window or "front end," which is called a "GUI" (for Graphical User Interface). Example: The play, Stop, and Pause buttons on your computer's CD control panel is the GUI for playing the audio on the CD. Yeah, yeah, we know...jargon in, jargon out.

After downloading the app to our desktop, we double-click on the installation icon. This installs the app in the Start menu of Windows 98. Remember to read the release notes. Release notes tend to be dense and boring conflict alerts, but not here. There's actually some useful information (such as tips and suggestions on how to use the Xing product in place of the perfectly good, yet slower, Fraunhofer-Gesellschaft MPEG codec).

Upon launching the app we get our first look at the GUI. It's simple to read and easy to use. There's a progress bar that shows how many jobs are started, how long is left to go, and what percentage of the file is encoded. There is helpful little context-based text help line at the bottom of the window. The documentation is clear and well written.

We'll now encode a 3 min. 35 sec. song that, as a WAV file, takes up 36.2 MB of disk space. We'll compare the length of time it takes to encode files at

different bit rates. These files are aimed at streaming over regular telephone modems. Remember: The higher the bit rate, the better the audio quality. The tradeoff is needing a faster modem.

First we encode our WAV file in stereo with a 44 kHz sampling rate and compressed to stream in mono at 16 kbps (for 28.8 k-or-faster modems). This shrinks the file size from 36.2 MB all the way down to an alarming 420 k. Using our Rube Goldberg, real-world testbed, the encoding process takes 32 seconds to go from that huge WAV file to the tiny, little, compressed MP3 file. Subjective playback judgment: it sounds fine. It sounds like what you'd expect when so much of the original file has been stripped out. The music is sonically legible and recognizable.

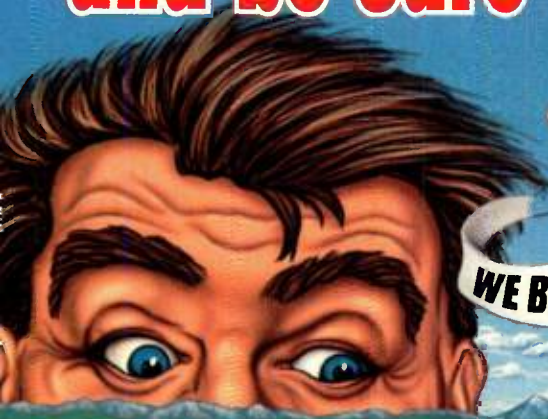
Then we encode our WAV file in mono with a 22 kHz sampling rate and compressed to stream at 32 kbps (for 56 k-or-faster modems). This shrinks the file size from 36.2 MB all the way down to a still-amazing 840 k. Continuing the use of our Rube Goldberg, real-world testbed, the encoding process takes 18 seconds (mostly due to the WAV file being sampled at 22 kHz). Subjective playback judgment: it sounds very nice, with somewhat more high end and clarity than the 16 kbps file.

Note: We had to resample the WAV file (which took 5 minutes) at 22 kHz. The GUI setting for streaming at 32 kbps called for a 44.1 kHz sampling rate, stereo. We used the backend of the encoder to encode with the sample-rate setting to 22 kHz, mono, because the end result of the 44.1 kHz, stereo encoded file sounded truly horrible. It was completely unusable. It's great that we can modify parameters, but having to do it from within the engine is a problem. Most users do not want to bother with using the MS-DOS command shell backend component of an application. After all... what is the GUI for?

The GUI lets us enter a 44.1 kHz input WAV file and (as it should) handles the "downsampling" (literally: making the file smaller) from the backend for you. The problem arises during the downsampling. Using the 44.1 kHz sampling rate, stereo, we end up with swooshy, poor-quality sound. If you downsample first (using Cool Edit) and then compress with the backend of the Xing MP3 Encoder, everything sounds fine. Still, it feels like something is not right with-

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COOL EDIT REVIEW

continued from page 138

other files, and punching. Although loop recording (where new takes go on new tracks each time the loop repeats) is not supported, punching includes a "take history" if you do multiple punches. This lets you select a particular punch out of a series of punches as your favorite take. As for snapping, the ruler gradations are somewhat confusing in bars:beats:ticks mode, but are otherwise generally usable. One hint: after snapping a piece of audio, if you change view resolution and the piece no longer looks "snapped," don't move the audio. It's still snapped, even if it doesn't look like it.

CE Pro's Mixdown function can bounce down all unmuted tracks to a new file. Fortunately, a master level control can help avoid distortion when bouncing large numbers of tracks.

CE Pro can sync to MTC, but can not generate MIDI timing messages — an odd omission for sequencer fans. Operationally, there are some nice touches, such as triggering shortcuts via MIDI keyboard (yes, you can use CE Pro as a sort

of virtual sampler). Finally, the online documentation is quite good; a hard-copy version is available on request.

LOOK AND FEEL

While CE Pro packs a lot of power for a reasonable price, it's not perfect. When I first installed it, there were crashing problems; a call to tech support (answered in under 30 seconds, by the way) recommended downloading a patch from Syntrillium's Web site, which solved some sort of DirectX-related issue.

Even with the fix, though, loading up lots of tracks and tweaking real-time processes such as pan and level can bring the system to its knees. To be fair, I tested CE Pro under tough conditions: creating drum loops from lots of little samples, copied and tweaked over dozens of tracks. Doing standard linear recording — a guitar solo, for example — is far less quirky. There are also some clumsy aspects to the multitrack interface, such as having to switch often between left and right mouse buttons when doing lots of copying and moving of samples, as you would do when creating loops.

The program works best if you make sure the premixing process is at

least halfway complete before you start doing real-time tweaks. I also experienced some occasional glitches (like a piece of audio disappearing from the multitrack window), although CE Pro provides some relief in the form of crash recovery. Upon re-booting, you're offered the option to pick up where you left off, and this works surprisingly well.

Overall, CE Pro does a lot right: comprehensive 2-track editing, understandable interface, support for multiple I/O cards, high track count, and high-resolution internal processing. This makes it much easier to overlook the occasional glitch.

In any event, the combination of multitrack recording and in-depth editing is a powerful one. Many hard-disk recording systems skimp on the waveform-level processing, and assume you can do what you want with plug-ins. Maybe so, but plug-ins are much more sluggish than the native processing in CE Pro's editor, and some of CE Pro's DSP is exceptionally good. In any event, my favorite part of working with CE Pro was knowing that I could take something from a track in Multitrack view and hop over to the Edit view to do some serious audio editing — that's where this program *really* delivers the goods. **EQ**

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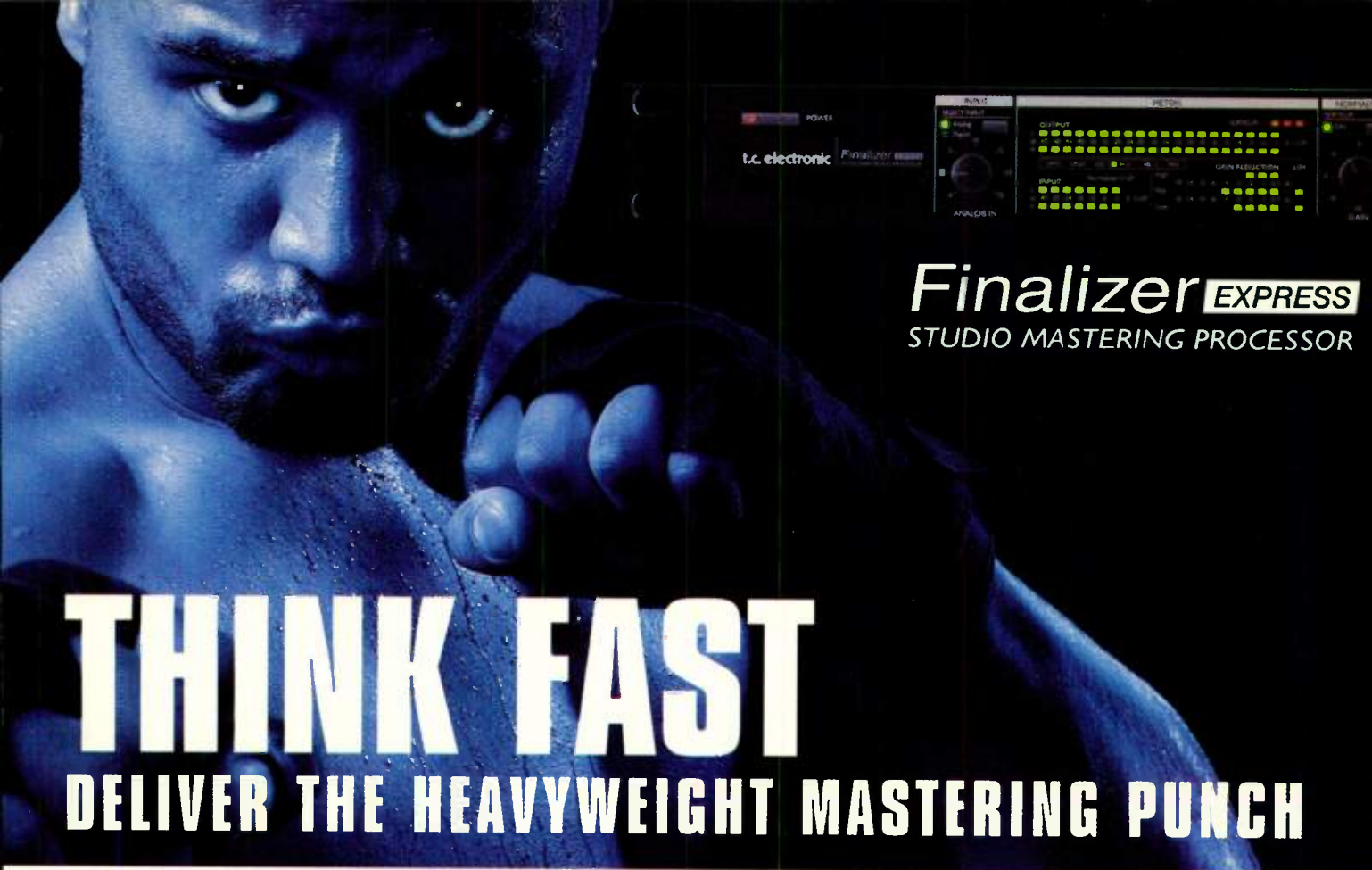
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LEXICON STUDIO

continued from page 144

ing some "spare" outs to simulate a typical send/return situation, or to do the equivalent of a track insert. One workaround is to use the ADAT I/O for multiple I/O, although you need eight channels of conversion (an ADAT will do the job, of course) to interface with other analog gear. You can also record into the analog and S/PDIF inputs simultaneously, so one of these stereo pairs could serve as an effects return.

THE CONTROL PANEL SOFTWARE

A utility for managing the system includes five tabbed pages for:

I/O: Sets gangle input and output levels, selects record and playback outputs, SCMS options, and de-emphasis on/off. You can theoretically record 12 tracks at a time (analog, S/PDIF, and ADAT), but with the test system I couldn't record more than six tracks without incurring record error warnings (part of this may have been due to beta drivers). If you want to transfer ADAT tracks but can't record them all at once, don't worry; do multiple passes and the ADAT sync will

keep everything locked properly.

Reverb: Allows assigning each reverb in and out to any system input or output, respectively. For example, add reverb while bouncing from ADAT into hard disk or between an analog in and S/PDIF out. You can also access the PC-90 parameters from this screen.

Punch: This mixes a selected input (i.e., the one you're playing into during an overdub situation) with any hard-disk tracks playing back. This circumvents latency problems that would result from monitoring the input through the A/D-D/A chain (Lexicon quotes 42 ms delay from input to output, which is relatively good given the current state-of-the-art). The tradeoff is you can't hear if there is any distortion occurring in the digital chain. Although, whatever software you're using should have metering that tips you off if something's wrong.

Timecode: Selects the timecode source and frame rate, and enables the timecode reader.

Clock Source: Chooses from the various clock sources (internal, ADAT sync, ADAT data, or S/PDIF).

WHAT ABOUT THE NEW KID?

The Lexicon Studio is best thought of as

quality I/O, with excellent reverb and flexible sync options. It has no real control surface, nor a specific personality; that's the function of the companion software. Although the ability to work with standard Windows drivers is welcome, you can only appreciate the LS's full potential when running Cubase VST, which fits the LS like a glove. In fact, the Achilles' heel of many competing systems is limited MIDI recording and editing; thanks to Cubase, that's not an issue.

Another factor is the two reverbs. If you were coveting a couple of PCM90's, you can go for the LS and have hard-disk recording and I/O thrown in "for free." The LS is also a logical choice for those running 2-channel digital audio editors, but who expect to expand into multi-track territory.

The sound quality is there, the Core-32 board is solid, and the LDI-16S (see sidebar) will boost the system's power considerably. In a nutshell, the LS is off to a promising start — but it's still young, and needs increased software and hardware support to achieve its potential. In any event, whichever software you do use, its sound will have the Lexicon *imprimatur* — and for many people, that will be the most important feature of the Lexicon Studio. **EQ**

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Symbolic Sound Kyma

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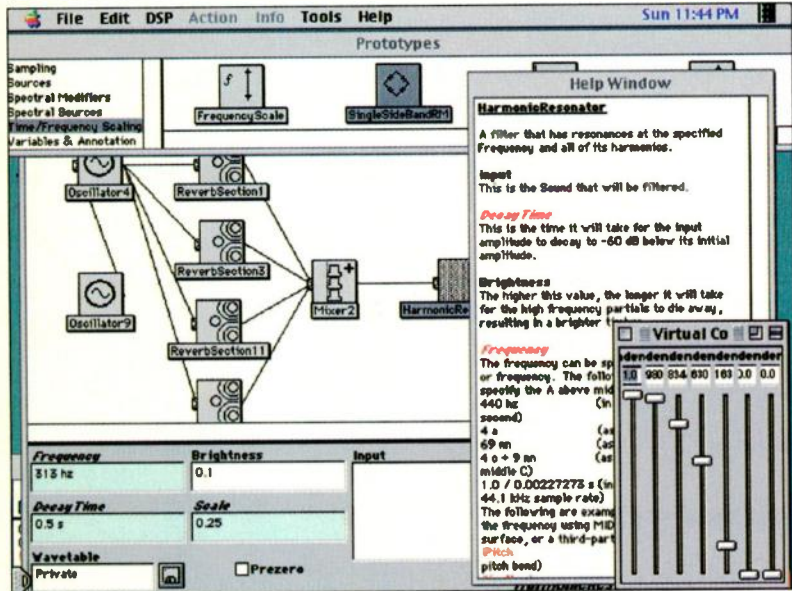


FIGURE 1: A simple Kyma patch. The sound editor module, toward the middle, is your "virtual modular synth." The control surface in the lower right sets the graphic EQ boost/cut for each band, and the parameters toward the lower left are for the harmonic resonator (its help file has just been invoked). The Prototype strip at the top has a ring modulator selected, which is about to be plopped in between the mixer and harmonic resonator.

If sound synthesis is in your job description, take note

BY CRAIG ANDERTON

Software synthesis — where you typically drag modules on-screen, connect them with virtual patch cords, then edit parameters to create sounds — may be the current buzzword, but Symbolic Sound has been doing it since the late '80s. So Kyma, while it continues to evolve, is a mature software sound synthesis program (or perhaps more accurately, sound design language) that supports both Windows and Mac OS machines (NuBus, PCI, ISA, or PCMCIA).

A review like this can deal only in broad strokes because Kyma is a deep program with enough back alleys to keep you

amused for years (if not decades). Still, the basic principles are pretty easy to grasp.

Like many other high-end software/hardware combos, Kyma uses the computer mostly as a graphics front end and data shuttler. The real work goes on in their 3U rack-mounted "computational sound engine," Capybara-66.

It accepts up to eight 56002-based cards, each with 12 MB of RAM. The basic unit has two cards (the review unit was fully expanded). I/O includes analog (stereo, XLR balanced ins and outs, but also supplied

with 1/4-inch adapters), digital (switchable between S/PDIF and AES/EBU), MIDI in/out/thru, and a connector for the multipin cable that trails back to a plug-in board for your host computer.

The software determines the Capybara's personality; it can do additive synthesis, sampling, a plethora of processing, subtractive and FM synthesis, granular synthesis, hard-disk recording, ring modulation, filtering, analog-style sequencing, pitch tracking, and much more, including complex combinations of the above. If you can think of a sound, Kyma can likely create it, or process an existing file to sound like it.

Nailing down voice count is tricky, as it depends on a sound's complexity and the number of expansion cards. I had no trouble getting at least 16 voices on pretty complex patches and well over 32 voices for simple ones.

BASICS

Installation into the Mac OS test system was a breeze, and Kyma worked immediately. You can start on a sort of "preset" level, using example sounds and public domain sounds from the Symbolic Sound FTP site, then eventually dig deeper to where you're not only stringing virtual modules together (Kyma calls them "sounds"), but writing scripts to control how they interact.

The screens are utilitarian. The main screen is the Sound Editor (fig. 1), for patching together virtual modules. Designating selected parameters as "hot spots" causes them to show up on a virtual control surface (e.g., graphic sliders).

EQ LAB REPORT

MANUFACTURER: Symbolic Sound, Box 2530, Champaign, IL 61825-2530. Tel: 217-355-6273. Web: www.SymbolicSound.com.

APPLICATION: Generate and process sound in any way imaginable.

SUMMARY: Kyma brings ivory tower synthesis to anyone with enough disposable income.

SYSTEM REQUIREMENTS: Mac or PowerMac (NuBus or PCI bus, System 7.1 or higher), PC-compatible (386, 486, or Pentium; ISA, PCI or PCMCIA slot; Windows 95/98), 32 MB RAM, 32 MB hard drive space, 256 colors recommended.

STRENGTHS: Mind-boggling array of sound-generating and processing functions provides an oasis of creativity in a world of presets; multiplatform and multibus compatibility; excellent sound quality; superb supporting materials; helps support the theory that intelligent life exists on earth.

WEAKNESSES: Sounds don't compile instantly; requires basic computer programming skills to get the most out of the system; stereo outs only.

PRICE: \$4400 for Capybara with two cards and software; extra cards, \$595.

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Kyma handles MIDI well; a fader unit, *a la* Peavey PC1600, or controller-rich master keyboard is a definite asset — you can assign most crucial parameters to MIDI control, as summarized in a global editor screen. But Kyma can also generate MIDI signals and sync to MIDI clocks or timecode, as well as trigger events at specific MTC times.

Some functions are available as “tools,” which are basically a collection of Kyma modules designed to perform a specific task, such as hard-disk recording. Going one level deeper, a sample editor window lets you

do the usual cut and paste for digital audio and create waveforms algorithmically.

Kyma organizes its available processes, called prototypes, into categories such as generators, spectral modifiers, combiners, waveshapers, etc. Version 4.5 has over 120 of these (including some that are quite esoteric); they appear on a strip just below the menu bar, where you can drag-and-drop the prototypes onto your sound editing screen. Once there, you double-click on the icon to edit its parameters — simple.

For a typical patch, see fig. 1. Oscil-

lator 9 modulates Oscillator 4, a sine wave oscillator, at a very slow rate. The sine wave output splits into four delay sections set to different delays, which are then mixed, processed through an harmonic resonator, and equalized with a graphic EQ.

While Kyma tries to keep matters simple, you need to understand what the prototypes do to use them intelligently. For example, the manual describes the ArcTan function's output as “...the four-quadrant arctangent of the ratio of the right-channel input to the left-channel input.” My right-brain orientation kinda balks at that sort of thing, but there's an easy solution: drag-and-drop the processor into the graphical signal path, then just listen.

Also, entering parameters requires typing — there are no virtual sliders (until you create a virtual control surface) or mouse-edited numerals. Basically, you're entering variables into a computer program; while Symbolic Sound has done a good job hiding that fact, the interface retains a command-line vibe.

While some parameter fields are simple (e.g., frequency in Hz), some require getting arithmetical. For example, suppose you want a frequency fader to cover an octave worth of notes starting at MIDI note 36 instead of the entire available range; you'd enter $!Frequency * 12 nn + 36 nn$. This may look scary, but, fortunately, the manual is excellent, there are plenty of tutorials and examples on the distribution CD, and there's significant online support.

One of Kyma's strengths is morphing, where the program analyzes two files and presents you with a virtual slider that allows you to play any part of the morph, or move the slider to morph manually. Another strength is live performance. The use of MIDI control and MIDI-controllable virtual control panels, coupled with the ability to call up precompiled sounds with MIDI program change commands, means you can “play” Kyma, not just program it.

Automation is an option via external control, using modules to automate other modules or Kyma's internal time-oriented functions. What's more, control changes can be exported as a standard MIDI file and called into a sound for control.

One of my favorite class of processors allows following external signals — frequency trackers, envelope followers, peak detectors, and the like. This makes it easy to have synthetic sounds follow characteristics set by real-time input or digital audio recorded on hard disk.

continued on page 157

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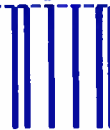
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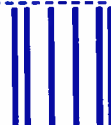
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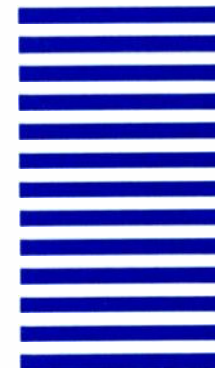
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FEZGUYS

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in the product. As it is a first release, we'll give them some slack and assume they're working out the bugs. The backend is great. Xing has always been about great hardcore backend technology. Can we say that?

Continuing an already idiosyncratic pattern, this GUI wouldn't let us encode at higher bit rates such as 64 kbps, 112 kbps, 192 kbps, and 320 kbps. For the purposes of this particular column (concerning streaming over telephone modems), it wasn't necessary. However, if they are listed, why not have them available?

Random Observations During Operation of Product: We like that if you cancel a job, you can choose which file(s) you might want to (re)encode. Also, it's good that the seek bar at the bottom of the Play window let us play back encoded files at random spots. It would be nice if you could choose the way that the app names target files. This would enable multiple encodes at different bit rates in the same batch. A time-saving bonus!

In summary, the backend is solid and it's fast, like they claim it is, but the GUI needs some work. Hopefully Xing will address the above issues in future releases. As we said, Xing's reputation has been great backend technology. Given that, our results are not surprising. If it's not a priority for them to put some resources into GUI improvements, then perhaps they might partner with an organization that can. Here's a radical concept: perhaps they could make an evaluation version freely available on the Internet. Users would provide valuable (and free) feedback. Use your users!

Is it worth it? Yes. Overall the product is very nice...and damn!...it's fast. We like that. It's worth 20 bucks.

Xing MP3 Encoder backend: Four Fezzes. Xing MP3 Encoder GUI: Two Fezzes.

The Line At The Bottom: Internet audio products are improving rapidly. The quality of the audio when compressed at low bit rates is getting better all the time. It would be good for interface designers to involve some regular layman in the design process. Designers could get some valuable perspective into how a musician or music-lover actually thinks and interacts with computers and software.

Next month we'll check out RealAudio's new G2 Encoder and compare the results with their previous 3.1 suite of tools. And, just for laughs, we'll also compare the results with our MP3 experience, such as with the above-mentioned Xing product! Woo!

LITTLE FEAT

continued from page 48

say, 'Oh, I have too much bass.' Or maybe not enough. I remember the first job I had in a studio. There was a TV lounge adjacent to the control room and the engineer spent all this time sitting in front of the TV with the sound turned down. Finally he made me sit next to him on the couch, and it turned out that this spot was where all of the wavelengths ended up in the right place. You could hear really well at this spot, and in that studio I'd always make sure I heard a mix in the lounge before I would print it."

According to Gil, one of the enjoyable aspects of recording *Under The Radar* was that "there's wasn't any bad food on that record! Little Feat are some of the nicest guys I've worked for and the band is really into the culinary arts. They even publish a calendar with different recipes from every band member for each month of the year." Maybe we can get them to invite us over for some gumbo...

EQ

KYMA REVIEW

continued from page 154

HEAD OF THE CLASS

I've tried to communicate the "feel" of Kyma rather than getting into specifics because those specifics are mind-boggling in their completeness. It's safe to say that if you want it, Kyma has it. Vocoding? Sure. Sample editing? Sure. Nonlinear transforms? Of course. Complex envelopes...grain cloud generation...waveshaping...microtonal tunings...pretty much the entire audio vocabulary is in there, ready for your editing pleasure. Thanks to the dedicated hardware, compiling complex sounds is relatively quick.

Kyma is a class act. The packaging, documentation, interface, hardware, and support are all impeccable. While some will cringe at the price — \$4400 for the basic model — to put it in perspective, this is less than what a Prophet-5 cost when it was introduced.

If you just want to emulate a few vintage synths and make some interesting sounds, several programs can do the job and are easier to figure out. But if your career rises or falls on your ability to truly push the sonic envelope, Kyma could easily end up being the most cost-effective — and fun — instrument in your studio.

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BRIAN WILSON

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"Oh well. Might as well cut." Not quite the same energy.

Was it hard to be the boss back then, being younger than the musicians you were directing?

No. It came naturally. I was emulating my father, his leadership ability. I would resort to yelling at times, or clapping my hands, just to emphasize the feeling I wanted to get. Various people in my life I turn to as my mentors: my dad, Phil Spector, and that's about it, as far as major influences on the way I go about doing things in the studio. I don't think I could have gotten a better education if I tried.

Were you influenced by the Beatles as well?

Not musically. But there was something about the spirit behind them that influenced me. "I want to hold your *haaannndd*." That dynamite. Whatever you want to call it. It got to me. Got my soul. I was jealous, of course. Who wasn't? It was an amazing experience just to be there with the Beatles and see and hear what they were up to.

Paul McCartney is a great admirer of yours.

Yeah. He told me and he told a lot of people in interviews that he was inspired by *Pet Sounds* when he did *Sgt. Pepper's Lonely Hearts Club Band*. That was a pump up for me. I felt all pumped up from that.

He's also said that "God Only Knows" is the best single ever made.

Really? I didn't know that.

Back in the '60s, did you prefer the sound at Western Recorders or Gold Star?

I liked them both. I liked Gold Star's echo chambers.

Eight-track recording came in around the time you were doing *Pet Sounds*...

No. "Good Vibrations." We started "Good Vibrations" one week and we went from studio to studio getting different sections of sounds. But we wound up at...I think it was RCA Victor Studios, and they had the first 8-track anywhere. So we mixed "Good Vibrations" on 8-track. I had perfect control on the cello and the theramin. If we'd done it all live, I don't think we could have gotten that kind of sound. That was the first time that I actually ever stacked tracks. Did one thing, then another.

How does it feel that your sound and style is being discovered by a new generation — guys like the High Llamas?

I think it's wonderful that people could think of us as somebody they would

want to be like. That's always a big thrill of mine, when I hear people tell me that. I heard you're going to do another record with Joe Thomas.

If I do another record, it will probably be with Joe Thomas. But I want it to be a rock 'n' roll album. I want to have the beat up. I want it to be exciting. I have lots of songs. But I don't know if I'll ever work with my group [i.e., the Beach Boys] again. I say "my group." "The group." Since Carl passed away, it's been hard. I personally don't know when Mike [Love, Beach Boys' lead vocalist] and I can talk about it. We don't seem to want to. Maybe it shook us up a little bit too much. So we're not talking about it. It's a weird trip. It will take a little time for us to get used to him being gone.

You have plans to do some live shows?

We're gonna do some concerts in October. I never did a solo tour. This will be the first major tour I'll ever take. Hopefully, I'll be emotionally strong enough to do it. But the last one I did, I had lot of hardship. I went through a lot of strange trips to do a concert in St. Charles, Illinois [in May '98, at the Norris Cultural Arts Center]. I was very scared. But I got a standing ovation when I walked out. For about three minutes, people just clapped and clapped and clapped. That kind of broke the ice, and I felt a little bit better.



WEB PICKS

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(www.winfiles.com/apps/98/multimedia.html). Here's where to find players/editors for MIDI, MOD, and WAV files, along with other utilities and links to pages with more shareware (I couldn't resist downloading the Brain-Wave Generator). There are some cool graphics utilities, too. Move closer to the home page to find links to other shareware and sites with updated drivers for a wide variety of Windows-oriented hardware (Windows 98 upgraders, take note).

• **Audiograbber** (www.audiograbber.com-us.net). If you're into using sample or loop CDs, this extremely useful and clever program can transfer data digitally to hard disk from an audio CD-ROM (SCSI or IDE-ATAPI). This is great when grabbing samples from sample CDs that you want to edit in a sample-editing program or transfer to a sampler. Check out the free demo, which lets you access half of a CD's tracks; the full version costs \$25.



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OTARI FIRST LOOK

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have been replaced with 25-pin D-Sub connectors for balanced operation. There are six D-Subs on board — one each for input tracks 1–8, 9–16, and 17–24 with corresponding outputs for tracks 1–8, 9–16, and 17–24. This type of connector is generally considered more “professional” by virtue of greater surface area for pin contact in addition to the fact that it’s a single point, threaded connection and, hence, more secure. Both A/D and D/A conversion is handled by 24-bit Delta-Sigma converters with 128X oversampling. RADAR I used 16-bit A/Ds and 18-bit D/As.

There are three 25-pin D-Subs for digital I/O using the TDIF digital format. Support for TDIF is standard on all RADAR II models shipped in the U.S. market. Again, Otari is aiming for the post market, as TDIF is the accepted transfer format in postproduction. By the time you read this, Otari will also be offering an optional 24-channel AES/EBU interface for RADAR II.

The rear panel also includes AES/EBU and S/PDIF digital I/O terminated in XLR and coaxial connectors, respectively. As both AES/EBU and S/PDIF are 2-channel formats, Otari also makes 8- and 24-channel AES/EBU add-ons for their optional UFC-24 Universal Format Converter. The UFC-24 also facilitates digital connections with ADAT, DASH, and other formats.

For sync reference, RADAR II provides two BNC female connectors for Sync In, Out/Thru with an On/Off switch for 75-ohm signal. The unit locks to both NTSC and PAL composite video signals. Also on BNC connectors are Word Clock In and Out for interconnection with other digital audio equipment. MIDI In, Out and Thru ports are provided for MIDI Machine Control (MMC) and MIDI timecode (MTC), while SMPTE timecode inputs and outputs are terminated in XLR connectors. RADAR II locks to all standard frame rates.

Remaining connectors include a Wide SCSI 2 controller port for connecting multiple external drives and a series of 9-pin serial connectors. These DB-9 connectors include input for RS-422 serial communication plus input and output connectors for the system’s RADARLINK. RADARLINK is Otari’s communications protocol for interconnecting two or more RADAR II’s to create a larger multitrack environment. When multiple RADAR II’s are connected in this manner, all tracks are phase locked and sample accurate. As the RE-8II Session Controller supports a 48-

track environment, RADARLINK is the key to making this happen. There is also a 15-pin port for connection of a standard VGA monitor for use with Otari’s RADAR View software and a parallel PC port for future expansion.

BETWEEN THE FRONT AND REAR PANELS

Internally, RADAR II is equally as different from its predecessor as it is externally. Whereas the original had separate drives for each 8-track module within the unit, RADAR II comes standard with a removable (via the Kingston carrier) 9 GB hard drive that provides over 40 minutes of 24-bit, 24-track digital audio. Note that I’ve mentioned “24-bit” on more than one occasion. This is a very important distinction, as RADAR I was a 16-bit system.

Supported sample rates on RADAR II include 32, 44.056, 44.1, 47.952, and 48 kHz. At 44.1 kHz, Varispeed ranges from +11.9 percent to –50 percent. At 48 kHz, Varispeed ranges from +2.8 percent to –50 percent. In 24-bit mode, dynamic range equals an “A” weighted rating of 100.5 dB while total harmonic distortion @ 1 kHz is less than 0.006 percent “A” weighted.

Like the original, RADAR II has the ability to handle 99 projects (based upon total recording time), each with 99 cue points.

THE RE-8II SESSION CONTROLLER

Like the recorder, the new RE-8II Session Controller for RADAR II has undergone a series of significant changes. For starters, the RE-8II is now a 48-track controller with a removable meter-bridge — supporting two RADAR II recorders. At first glance, there appears to be many more buttons than previously, and there are! Since the Track Arming buttons no longer exist on the main unit, they are now prominently positioned in two rows across the top of the remote. A series of macro keys have also been added to the remote. This handy feature enables you to program a series of keystrokes that would otherwise involve multiple button presses.

As in the original remote, there is an integrated QWERTY keyboard for labeling tracks, etc. and a backlit 32-character LCD for keeping track of system status. Like the RE-8, the RE-8II positions its transport keys in the bottom center, provides a 10-key pad for cue points, numeric entry of TC addresses, etc., and incorporates a jog/shuttle wheel plus cursor keys. A 30-foot extension cable is included as part of the system package.

Otari’s new RADAR II represents a logical step forward by incorporating features that will enhance sound qual-

ity and bring greater flexibility to the work environment by means of removable media, while providing a more comprehensive control interface. If you’re in the market for a digital multitrack recorder, RADAR II deserves a place on your shopping list.

MSRP is \$24,950. For more information, contact Otari, tel: 800-877-0577. Web: www.otari.com. Circle EQ free lit. #149.

YOU GOT SOME CASE

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“We found that in clubs it was a real pain in the ass for the whole crew to be grabbing boxes of merch out of the bus. Now the guys don’t ever have to touch a shirt — just wheel in this 2 x 5 case. At home, Jerry preloads and pre-counts the shirts into bundles of six each and tapes the bundles together. This makes counting out easy: if the bundle is broken, you count it. If not, you know there’s six shirts. I have a spreadsheet in my computer, and now it takes me about ten minutes to count in and out. We’ve been doing this for over a year, and it’s been flawless.

“On the right hand side of the case is a table that folds out of the case to display the band’s merchandise. The idea was to build a closed-in table with merch laid into the top for display under a Plexiglas cover. We felted the table surface, I folded and arranged the shirts the way I wanted, and stapled them in place. I have very little difficulty with the stuff moving around, and it takes a kicking. We sit the case against a wall and the merch person sits in front of the case. The table is sealed shut and the lid on the left keeps people away from the chicken coop. And club owners love it because they don’t have to do any work setting up a table.”

“This is not rocket science,” Barry admits, “but it makes our life easier and makes for a better situation. We won’t name the band, but there was a big national act we were touring with. They had nine guys in the crew and rolled in at 9 AM. We rolled in at 10 AM, hung a bit, and then Ken and I loaded in. By the time those nine guys were done setting up their backline, the two of us were done with ours. In the past, we did a bit of scrambling, but over time we’ve managed to get it all down. We know the gear’s safe and we know where it is. In fact, I think we know more about the backline than the band does!”

Ken Schultz can be reached via e-mail at dryrot@aol.com. Barry Stock may be reached via e-mail at luthier1@gta.1gs.net.

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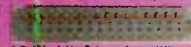
CIRCLE 11 ON INFO CARD

PROBLEM SOLVERS

MTA INTERMIX MODULAR MIXING SYSTEM



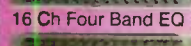
Master Control Unit



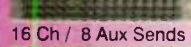
16 Ch MicLine Amplifier



16 Ch Four Band EQ



16 Ch / 8 Aux Sends



16 Tr Mon & Tape Ret



16 Ch / 16 Tr Routing & Pan

Malcolm Toft, a former recording engineer and founder of Trident Audio, has developed one of the most unique mixing systems to date.

The beauty of this system is that each Module can be used as a stand alone device, or to enhance an existing Console.

Common to all Modules in the Intermix System is the ability to link one Module to any one or any number of Modules.

CHECK THIS OUT!

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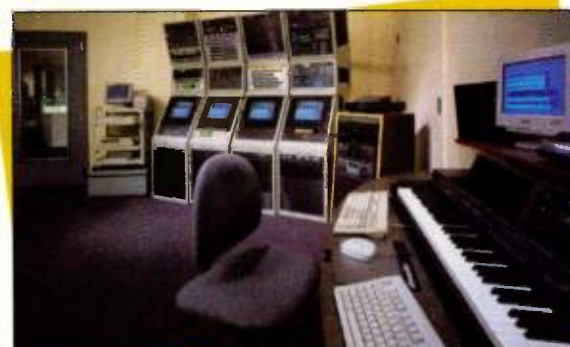
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DIGITAL MIXERS

MACKIE

Digital 8 Bus Mixing Console



Everything you've been waiting for and more!!! The new digital 8 bus from Mackie features great sound quality, full recording and mixdown capabilities, motorized faders and an array of digital features geared to take you flying into the next century. See for yourself what the entire industry is raving about.

- FEATURES-**
- 48 channels of automated compression, gating, EQ and delay
 - Built-in 3-way meter display keeps you on top of your mix.
 - Built-in meter bridge,
 - Ultramix II automation for complete control, hook up an S-VGA monitor and you'll feel like you spent a lot more money.
 - All functions can be automated, not just levels and mutes. Store EQ, reverb, compression, gating and even Aux send information.
 - Fast SCENE automation allows you to change parameter snapshots on every beat.
 - Reads Standard MIDI tempo maps, displaying clock info on the built-in position counter.
 - Truly the cutting edge of mixing technology.



Panasonic

WR-DA7 Digital Mixing Console



Stop dreaming about your digital future, it's here! The Panasonic WR-DA7 digital mixer features 32-bit internal processing combined with 24-bit A/D and D/A converters as well as moving faders, instant recall, surround sound capabilities, and much more. Best of all, it's from Panasonic.

- FEATURES-**
- 32 Inputs/6 AUX send/returns
 - 24-bit converters
 - Large backlit LCD screen displays EQ, bus and aux assignments, and dynamic/delay settings.
 - 4-band parametric EQ
 - Choice of Gate/Compressor/Limiter or Expander on each channel
 - 5.1 channel surround sound in three modes on the bus outputs
 - Output MMC
 - Optional MIDI joystick



TASCAM

TMD1000 Digital Mixing Console



You want to see what all the digital mixing buzz is about? The NEW TMD100 from Tascam will have you smiling & automatin' in no time. It features fully automated EQ, levels, muting, panning and more in an attractive digital board with an analog 'feel'. Your digital future never looked, or sounded, so clear.

- FEATURES-**
- 4 XLR mic inputs, 8 1/4" balanced TRS inputs.
 - 20-bit A/D D/A conversion, 64x oversampling on input, 128x on output.
 - Store all settings, fully MIDI compatible.
 - Optional IF-TD1000 adds another 8 channels of TDIF and a 2-channel sample rate converter.
 - Optional FX-1000 Fx board adds another 4 dynamic processors and another pair of stereo effects.



MIC PREAMPS

Focusrite

Green 3 "Voicebox MKII"



The Voicebox MKII provides a signal path of exceptional clarity and smoothness for mic recording, combining an ultra-high quality mic amp, an all new Focusrite EQ section optimized for voice, and full Focusrite dynamics. The new MKII now includes a line input for recording and mixdown applications.

- FEATURES-**
- Same mic pre section as found on the Green Dual Mic Pre includes +48V phantom power, phase reverse, and a 75Hz high-pass filter. Mute control and a true-VU response LED bargraph are also provided
 - EQ section includes a mid parametric band with frequency and gain control as well as a gentle bell shape to bring out the character of the voice.
 - Dynamics section offers important voice processing functions of compression and de-essing combined with a noise reducing expander
 - Single balanced Class A VCA delivers low distortion and a S/N ratio as low as -96dB



EFFECTS PROCESSING

t.c. electronic

Finalizer Plus



Improving on the multi-award winning Finalizer platform, The Finalizer Plus delivers an unprecedented level of clarity, warmth and punch to your mix. Inserted between the stereo output of your mixer or workstation and your master recording media, the Finalizer Plus dramatically rounds out your material, creating that "radio ready" sound.

- FEATURES-**
- Balanced Analog as well as Digital outputs including AES/EBU, S/PDIF, & TOS.
 - 24-bit precision A/D & D/A Converters
 - 5-band 24-bit stereo EQ
 - Enhance - De-essing, stereo adjust or digital radiance
 - Real-time gain maximizer
 - Variable slope multi-band expander
 - Multi-band compressor • Word Clock Sync
 - MIDI section useful for controlling sequencer faces or any of the Finalizer's parameters from a remote MIDI controller.



Lexicon

PCM81 Multi-Effects Processor



The PCM-81 has everything that made the PCM80 the top choice among studio effects processors, and more. More effects, more algorithms, longer delay and full AES/EBU I/O.

- FEATURES-**
- 300 Presets include pitch, reverb, ambience, sophisticated modulators, 20 second stereo delays, and dynamic spatialization effects for 2-channel or surround sound applications
 - 2 digital processors including Lexicon's Lexchip for the reverb and a second DSP engine for the other effects.
 - 24-bit internal processing
 - Dynamic patching matrix for maximum effects control.
 - PCM card slot



EQUALIZERS

Focusrite

Green 2 "Focus EQ"



The Green 2 Focus EQ is suitable for a variety of applications combining a Focusrite equalizer section with a multi-source input section. Use it as a high-quality front end for recording applications or patch it into the send/return loop to upgrade a single channel of console eq, either way, it sounds great.

- FEATURES-**
- XLR & 1/4" inputs are similar to the Dual Mic Pre but have been adapted to cope with a wider range of levels.
 - VU metering via a 10-LED bargraph
 - EQ section derived from the Red and Blue range processors for superb audio quality.



COMPRESSORS

JOE MEEK

VC1 Studio Channel



The Joe Meek Studio Channel offers three pieces of studio gear in one. It features an excellent transformer coupled mic preamp, a great compressor and an enhancer unit all in a 2U rackmount design. Find out why more and more studio owners can live without one.

- FEATURES-**
- 48V phantom power. Fully balanced operation
 - Mic/Line input switch
 - Mono photo-optical compressor
 - High pass filter for large diaphragm mics
 - Extra XLR input on front makes for easy patching
 - Compression In/Out and VU/compression meter switches
 - Twin balanced XLR outputs with one DI XLR output for stage use
 - Enhancer In/Out switch and enhance indicator
 - Internal power supply 115/230V AC



dbx

Blue Series 160S Stereo Compressor

The dbx 160S combines the best features of all the great dbx compressors in a well-built unit where the craftsmanship is as stunning as the engineering is innovative. This is truly a desirable compressor.

- FEATURES-**
- 127dB dynamic range • Program dependent "Auto", or fully variable attack and release
 - Hard knee/OverEasy switchable.





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HARD DISK RECORDERS

Roland

VS1680 Digital Production Studio



The new VS-1680 Digital Studio Workstation is a complete 16 track, 24-bit recording, editing, mixing and effects processing system in a compact tabletop workstation. With its advanced features, amazing sound quality and intuitive new user interface, the VS-1680 can satisfy your wanderlust.

FEATURES-

- 16 tracks of hard disk recording, 256 virtual tracks.
- 24-bit MT Pro Recording Mode for massive headroom and dynamic range.
- Large 320 x 240 dot graphic LCD provides simultaneous level meters, playlist, EQ curves, EFX settings, waveforms and more.
- 20-bit A/D D/A converters
- 2 optional 24-bit stereo effects processors (VS8F-2) provide up to 8 channels of independent effects processing.
- New EZ routing function allows users to create and

save various recording, mixing, track bouncing, and other comprehensive mixer templates for instant recall.

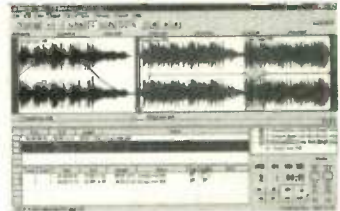
- 10 audio inputs: 2 balanced XLR-type inputs w/ phantom power, 6 balanced 1/4" inputs, and 1 stereo digital input (optical/coaxial)
- 12 audio outs: 8x RCA, 2x stereo digital & phones.
- Direct audio CD recording and data backup using optional VS-CDR-16 CD recorder.

SOFTWARE



SONIC FOUNDRY CD Architect & CD Factory

CD Architect is the perfect solution for designing professional audio CDs to Red Book spec on Windows NT and Windows 95. Sample audio from compact disks, record from DAT, or digitize material through a sound card. It comes complete with an editor including dozens of effects and tools to process sound files and can optionally operate as a Sound Forge plug-in. CD Factory adds a CD burner, SCSI card and cable for a complete production package.



FEATURES-

- Multi file playlisting
- Master volume faders (-96dB to +24dB)
- Adjustable envelope levels for any region
- Mix or crossfade overlapped regions
- Convert from mono to stereo on the fly

- Multiple levels of undo/redo
- Up to 99 tracks with 99 subindexes per track
- Make glass-masters directly from burned CDs.

STUDIO DAT-RECORDERS

Panasonic SV-3800 & SV-4100

The SV-3800 & SV-4100 feature highly accurate and reliable transport mechanisms with search speeds of up to 400X normal. Both use 20-bit D/A converters to satisfy even the highest professional expectations. The SV-4100 adds features such as instant start, program & cue assignment, enhanced system diagnostics, multiple digital interfaces and more. Panasonic DATs are found in studios throughout the world and are widely recognized as the most reliable DAT machines available on the market today.



FEATURES-

- 64x Oversampling A/D converter for outstanding phase characteristics
- Search by start ID or program number
- Single program play, handy for post.

- Adjustable analog input attenuation, +4/-10dBu
- L/R independent record levels
- Front panel hour meter display
- 8-pin parallel remote terminal
- 250x normal speed search

AKAI DR16 16-Track HD Recorder

The Akai DR16 is a digital hard disk recorder with sophisticated non-destructive editing functions for near instant data access. Recording & playback is as straight forward as tape. The DR16HD ships with an internal 2GB drive for 24 minutes per track of record time.



TURN YOUR DR16 INTO A PRODUCTION WORKHORSE WITH THESE POWERFUL EXPANSION OPTIONS!

- MT8 Mixer controller • DL16 Remote control unit • IB801S SCSI Interface board
- IB802T SMPTE interface board • IB803M MIDI interface board • IB804A ADAT interface board
- IB805R RS422 Interface board • IB806B Bi-phase interface board
- IB807V VGS monitor interface board • EQ16 16-channel digital EQ board • ALX50 Remote Cable

DIGITAL MULTI-TRACK RECORDERS

TASCAM DA-98 Digital Audio Recorder

The DA-98 takes all the advantages offered by the DTRS format and significantly ups the ante for the professional and post-production professional alike. With enhanced A/D and D/A converters, a comprehensive LCD display and full compatibility with the DA-88 and DA-38, the DA-98 delivers the absolute best in digital multitrack functionality.



FEATURES-

- Confidence monitoring for playback and metering
- Individual input monitor select switch facilitates easier checking of Source/Tape levels
- Switchable reference levels for integration into a variety of recording environments with internal tone generator
- Digital track copy/electronic patch bay functionality
- Comprehensive LCD display for easy system navigation

- Dedicated function/numeric keys make operation easier
- Built-in sync with support for MMC and Sony P2
- D-sub connector (37-pin) for parallel interface with external controller
- Optional RM-98 rack-mount ear for use with Accuride 20C system

DA-88 A standard digital multitrack for post-production and winner of the Emmy award for technical excellence, the DA-88 delivers the best of Tascam's Hi-8 digital format. Its Shuttle/Jog wheel and track delay function allow for precise cueing and synchronization and the modular design allows for easy servicing and performance enhancements with third-party options.

DA-38 The DA-38 was designed for musicians. Using the same Hi-8 format as the highly acclaimed DA-88, the DA-38 is an 8 track modular design that sounds great. It features an extremely fast transport, compatibility with Hi-8 tapes recorded on other machines, rugged construction, ergonomic design and sync compatibility with DA-88s.

ALESIS ADAT XT20 Digital Audio Recorder



The new ADAT-XT20 provides a new standard in audio quality for affordable professional recorders while remaining completely compatible with over 100,000 ADATs in use worldwide. The XT20 uses the latest ultra-high fidelity 20-bit oversampling digital converters for sonic excellence, it could change the world.

FEATURES-

- 10-point autolocate system
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.
- Remote control
- Servo-balanced 56-pin ELCO connector.

- Built-in electronic patchbay
- Copy/paste digital edits between machines or even within a single unit. Track Copy feature makes a digital clone of any track (or group of tracks) and copies it to any other track (or group) on the same recorder.

TASCAM DA-30MKII

A great sounding DAT, the DA-30MKII is a standard mastering deck used in most production houses around the world. Among many other pro features, its DATA/SHUTTLE wheel allows for high-speed cueing, quick program entry and fast locating.



FEATURES-

- Multiple sampling rates (48, 44.1, and 32kHz).
- Extended (4-hour) play at 32kHz
- Digital I/O featuring both AES/EBU and S/PDIF.
- XLR balanced and RCA unbalanced connections.

- Full function wireless remote.
- Variable speed shuttle wheel.
- SCMS-free recording with selectable ID.
- Parallel port for control I/O from external equipment.

Fostex D-15

The new Fostex D-15 features built in 8Mbit of RAM for instant start and scrubbing as well as a host of new features aimed at audio post production and recording studio environments. Optional expansion boards can be added to include SMPTE and RS-422 compatibility, allowing the D-15 to grow as you do.



FEATURES-

- Hold the peak reading on the digital bargraphs with a choice of 5 different settings
- Set cue levels and cue times
- Supports all frame rates including 30p
- Newly designed, 4-motor transport is faster and more efficient (120 minute tape shuttles in about 60 sec.)
- Parallel interface • Front panel trim pots in addition to the level inputs

D-15TC & D-15TCR

The D-15TC comes with the addition of optional chase and sync capability installed. It also includes timecode reading and output. The D-15TCR comes with the further addition of an optional RS-422 port installed, adding timecode and serial control (Sony protocol except vari-speed)

SONY PCM-R500

Incorporating Sony's legendary high-reliability 4D D. Mechanism, the PCM-R500 sets a new standard for professional DAT recorders. The Jog/Shuttle wheel offers outstanding operational ease while extensive interface options and multiple menu modes meet a wide range of application needs.



FEATURES-

- Set-up menu for preference selection. Use this menu for setting ID6, level sync threshold, date & more. Also selects error indicator.
- Includes 8-pin parallel & wireless remote controls

- SBM recording for improved S/N (Sounds like 20bit)
- Independent L/R recording levels
- Equipped with auto head cleaning for improved sound quality.

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MIDI HARDWARE



Mark of the Unicorn
MIDI
Time Piece™ AV
8x8 Mac/PC MIDI Interface

The MTP AV takes the world renowned MTP II and adds synchronization that you really need like video genlock, ADAT sync, word clock sync, and even Digidesign superclock!

FEATURES-

- Same unit works on both Mac & PC platforms.
- 8x8 MIDI merge matrix, 128 MIDI channels.
- Fully programmable from the front panel.
- 128 scene, battery-backed memory.
- Fast 1x mode for high-speed MIDI data transfer.

Digital
Time Piece™
Digital Interface



Think of it as the digital synchronization hub for your recording studio. The Digital Timepiece provides stable, centralized sync for most analog, digital audio, and video equipment. Lock together ADATs, DA-88's, ProTools, word clock, S/PDIF, video, SMPTE, and MMC computers and devices flawlessly. It ships with "Clockworks" software which gives you access to its many advanced features and remote control of some equipment settings such as record arm.

OPCODE

Studio 64XTC
Mac/PC MIDI Interface



The Studio 64XTC takes the as-sorted, individual pieces of your studio-your computer, MIDI devices, digital and analog multitracks and even pro video decks, and puts them all in sync.

FEATURES-

- 4 In / 4 Out, 64 channel MIDI/SMPTE interface/patchbay with powerful multitrack & video sync features
- ACAT sync with MIDI machine control
- Simultaneous wordclock and Superclock output, 44.1kHz or 48kHz for perfect sync with ADAT, DA-88 and ProTools
- Video and Blackburst in (NTSC and PAL)
- Cross-platform Mac and Windows compatibility

SAMPLING

E-MU
e-6400
Sampling and more!



The e-6400 from EMU features an easy interface that makes sampling easy. Automated features like looping, normalizing and more allow you to flexibly create your own sound palettes or access any of the 400 sounds provided on 2 CDs for unlimited sound creation. It is upgradeable to 128MB of RAM (4MB standard) and features 64 voice polyphony, 8 balanced analog outputs, SCSI, stereo phase-locked time compression, digital re-sampling and more. A dream machine.

KEYBOARDS & SOUND MODULES



XP60 & XP80 Music Workstations

The XP-80 delivers everything you've ever wanted in a music workstation. An unprecedented collection of carefully integrated features provide instant response, maximum realtime control and incredible user expandability. The XP-80 features a pro-quality 76-note weighted action keyboard while the NEW XP-60 features the same sound engine in a 61-note keyboard.

XP80 FEATURES-

- 64-voice polyphony and 16-part multitimbral capability
- 16 Mbytes of internal waveform memory; 80Mbytes when fully expanded (16-bit linear format)
- 16-track MRC-pro sequencer with direct from disk playback. Sequencer holds approx. 60,000 notes
- New sequencer functions like "non-stop" loop recording and refined Groove Quantize template

- Enhanced realtime performance capability with advanced Arpeggiator including MIDI sync and guitar strum mode and Realtime Phrase Sequence (RPS) for on-the-fly triggering of patterns
- 40 insert effects in addition to reverb and chorus
- 2 pairs of independent stereo outputs; click output jack with volume knob
- Large backlit LCD display



SR-JV80 Series Expansion Boards

Roland's SR-JV80-Series wave expansion boards provide JV and XP instrument owners a great-sounding, cost-effective way to customize their instruments. Each board holds approx. 8Mb of entirely new waveforms, ready to be played or programmed as you desire.

Boards Include-

Pop, Orchestral, Piano, Vintage Synths, World, Super Sound Set, Keys of the 60's & 70's, Session, Bass & Drums, Techno & Hip-Hop Collection.



KURZWEIL

K2500 Series Music Workstations

The K2500 series from Kurzweil utilizes the acclaimed V.A.S.T. technology for top-quality professional sound. Available in Rack mount, 76-key, and 88 weighted key keyboard configurations, these keyboards combine ROM based samples, on-board effects, V.A.S.T. synthesis technology and full sampling capabilities on some units.

FEATURES-

- True 48-voice polyphony
- Fluorescent 64 x 240 backlit display
- Up to 128MB sample memory
- Full MIDI controller capabilities
- 32-track sequencer
- Sampling option available
- Dual SCSI ports
- DMTI Digital Multitrack interface option for data format and sample rate conversion (Interfaces with ADATs or DA-88s)



KORG

Trinity Series Music Workstations DRS

Korg's Trinity Series represents a breakthrough in sound synthesis and an incredible user interface. It's touch-screen display is like nothing else in the industry, allowing you to select and program patches with the touch of a finger. The 24MB of internal ROM are sampled using ACCESS which fully digitizes sound production from source to filter to effects. Korg's DSP based Multi Oscillator Synthesis System (MOSS) is capable of reproducing 5 different synthesis methods like Analog synthesis, Physical Modeling, and variable Phase Modulation (VPM).

FEATURES-

- 16 track, 80,000 note MIDI sequencer
- Flexible, assignable controllers
- DRS (Digital Recording System) features a hard disk recorder and various digital interfaces for networking a digital recording system configured with ADAT, DAT recorder and hard disk
- 256 programs, 256 combinations
- Reads KORG sample DATA library and AKAI sample library using optional 8MB Flash ROM board

(Digital IF, SCSI, Hard Disk Recorder, and sample Playback/Flash ROM functions are supplied by optional upgrade boards)



88 Weighted-key/Solo Synth

76-key/Solo Synth

61-key/Solo Synth

61-key

MONITORS

KRK
V8

Powered Studio Monitors

These new powered studio monitors from KRK supply 130 watts of clean performance. Their 8" woofer & 1" silk dome tweeter ensure crystal highs as well as the bass response needed for today's studio environments.

FEATURES-

- 49Hz - 22kHz
- Magnetically shielded for use near video monitors



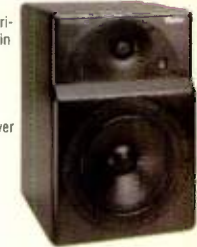
Hafler
TRM-8

Powered Studio Monitors

Winner of Pro Audio Review's PAR Excellence Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Trans-nova power amp circuitry.

FEATURES-

- 45Hz - 21kHz, ±2dB
- 75W HF, 150W LF
- Electronically & Acoustically matched



MACKIE

HR824

These new close-field monitors from Mackie have made a big stir. They sound great, they're affordable, they're internally bi-amped. "What's the catch?" Let us know if you find one.

FEATURES-

- 150W Bass amp, 100W Treble amp
- Full space, half space and quarter space placement compensation
- Frequency Response 39Hz to 22kHz, ±1.5dB



TANNOY
Reveal

The latest playback monitor from Tannoy, the Reveal has an extremely detailed, dynamic sound with a wide, flat frequency response.

FEATURES-

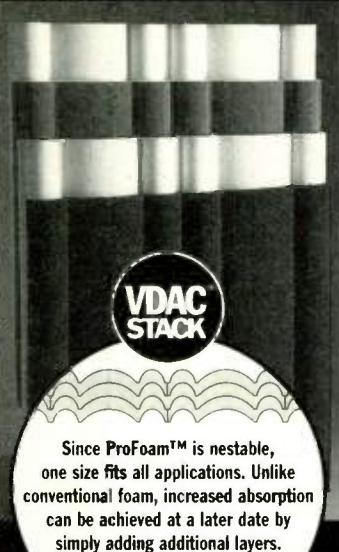
- 1" soft dome high frequency unit
- Long throw 6.5" bass driver
- Magnetic shielding for close use to video monitors
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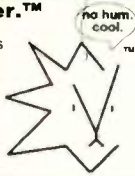
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Beating *Bad Debts*

Cash in the hand
is worth two checks
in the mail

BY MARTIN POLON



Nothing is more vexing to the owner/operators of recording studios of all sizes (as well as to those running any other businesses) as not getting paid. Everybody — and I do mean everybody — at one time or another finds themselves holding at least one bad debt in their financial portfolio! The trick is to keep the number of bad debts down as close to zero sum as possible and to collect on the bad debts that have accumulated through the years. Let's take a brief look at how a recording studio might collect a string of bad debts.

A. The most obvious way is by extending credit to new or unknown customers who want to have one or several recording sessions. They simply do not pay at the end of their sessions.

B. Another way is to extend credit to major clients such as the record labels. What goes wrong there is that the band in question fails to sell many records and the label bean counters decide not to pay your bill until there is some profit in the band in question's accounts. Alternatively, the artists and repertoire (A&R) specialist assigned to the recordings at your studio, "boogies" to a better paying gig, and there is no one at the label who wants to "OK" your invoice.

C. You accept a personal or business check for payment at the end of scheduled sessions on a Saturday and on the following Tuesday (after depositing

the check on Monday), the check bounces so high that after the bank notifies you NASA calls you to try and cut a deal for what is obviously going to be a new propulsion system into space.

D. An old "friend" calls you to ask for studio time without charge on the basis of his paying you back later, which is, as it turns out, much, much later!

At this point, you get the drift. Most studio owners that operate a for-profit operation frequently make the same mistakes made by other small-business owners. They over extend credit to too many customers, are much too loose in collecting payment prior to sessions, allow personal checks as payment, and so on.

To keep bad debt from the books of studios of all sizes, the following suggestions may help!

1. Solicit full payment up front and "in your face" prior to beginning recording sessions. Absolutely, positively, with no exceptions allowed. Tracking tells us that, in the studio business, those who want credit or to pay after the conclusion of the sessions are those who will ultimately stiff you.

2. Accept payment only by certified, cashier's, or bank-guaranteed checks, or credit cards if you have instant telephone verification and amount guarantee, or, as an acceptable last resort, cash.

3. Have a signed contract for each and every client with a well-written clause requiring the nonpaying client to pay all court costs. The contract should also have a time frame, such as three months, after which time court action is mandated.

4. If you must break your rules on not extending credit, as with record labels, you have the right to insist on both a letter of understanding and a contract, which makes subsequent legal action easier should they not pay.

There are obviously other issues

such as the tax implications of both short-term and long-term debt, the dangers of "leaning" too hard on clients who may well return such as the record labels, etc.

A. What to do about currently existing debt is more of a public relations challenge than a problem looking for legal retribution.

B. Certainly, bounced checks can end up in criminal court as fraud cases. But consider your reputation as the studio that put "So and So" and their band in the slammer. And criminal court will not put cash money (or any other kind) in your pocket.

C. Sometimes you can leverage an existing debt through mediation or arbitration, settling for less than is owed you. It may be better to calculate what your break-even is and take the money and run.

D. Unless an existing debt is bolstered by documentation and contracts, going to court is an expensive proposition that could cost as much as the debt itself.

E. Finally, you can try to sell your bad client debt to a "Factor," whose business is buying all kinds of business debt at a discount and then collecting at the full face amount from the debtor. Factors are generally legitimate and operate within the law. It may be

better again to take the 50-70 percent that Factors generally offer than to try and collect in full. Factors, however, did not just fall off of the proverbial "turnip truck" and will only purchase those debts where the debtor has some assets (record labels, advertising, and multimedia work for business clients, etc.).

You may ask yourself how does a Factor collect when you cannot. The answer is by employing obnoxious persons who constantly call the debtor, on-salary or on-retainer lawyers who have personality problems that they can take advantage of in collecting bad debts, and the like. **EQ**

Have a signed contract for each and every client with a well-written clause requiring the nonpaying client to pay all court costs.

ACROSS THE BOARD

continued from page 178

when you are creating a CD-R that will be replicated at a CD manufacturing plant. CD-R masters must be within certain error limits to be acceptable. All of the CD plants, most major record labels, and some mastering facilities have CD error-rate checkers that will verify the low-level errors on a CD or CD-R. This is the only way to tell how good or bad the disc is. Here are a few things to keep in mind when burning your master CD-R.

8. Burn the CD-R master at 2X. Extensive tests have shown that 2X has a much lower block error rate than 4X, 6X, or even 1X. Some record companies specify to their mastering facilities (Warner Bros. is one of them) that CD-R masters must be cut at 2X and that the disc will be unfit for duplication if BLERs (Block Error Rates) exceed 300 per second.

9. Use the CD recorder manufacturer's suggested media for master discs. Most recorders do not perform a true power calibration when starting a burn cycle, and are thus factory ad-

justed for a particular dye formulation. If your recorder is set for cyanine and you use phthalocyanine, the BLER will be higher. It doesn't seem to matter whether the reflective layer is silver or gold.

10. Always use Disk At Once mode for producing master discs. That means cut the whole disc in one pass, do not add tracks one at a time. Track At Once discs have a gazillion errors at the spot where the new track is added after the old track. Record companies will reject these discs in a heartbeat, and the CD plant will call and make you sign a waiver that you want to go ahead with this master. In the early days of CD-R, the CD plant glass mastering machines would refuse to take data from such a CD-R, but software updates have allowed them to go ahead if they have to.

11. Always use brand-name blank media or media that you know is manufactured properly. The dye layer and reflective coating must be uniform across the disc to produce an error-free finished disc. The power calibration done by the recorder is only performed at the innermost portion of the CD-R. I have tested CD-Rs that were excellent for the first 20 minutes, then got progressively worse as the recording ap-

proached the outer portion of the disc. Sometimes I buy inexpensive, no-name CD-Rs, but first I get samples, record them, and then run them through an error checker to make sure they perform to my satisfaction. I then spot-check every 20th CD-R. I use these no-name discs for reference discs, or when a client wants 50 or 100 copies to send to radio stations. I always use proven name-brand CD-Rs for masters and I verify each one with an error checker.

12. Always clean your blank discs with clean air to blow off any dust particles that may have been attracted to the statically charged disc. The recording laser has no idea whether it is burning a pit in a CD-R or the legs off of a dust mite. It only takes one good-sized dust particle to render a CD-R master useless. Remember, "Cleanliness is next to high fidelity."

CONCLUDING

That should about sum things up for this month. To tie up any loose ends as far as the VD topic I started with, I must relate a tragic story of a friend. She plays harp for a major symphony orchestra. She was diagnosed with "harpes," which was probably contracted by indiscriminate plucking around. **EQ**

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Who Put The VD in DVD?



Practice safe shopping
when selecting
a new format, and some
CD-R tips

BY ROGER NICHOLS

I'm serious (aren't I?) — DVD is one of the new "sensually transmitted" diseases striking the technologically savvy. I have been exposed to some of the earlier strains such as CD (chronic digitalis) and DAT (digital audio trauma) for years. I actually think I have a case of carpal tunnel vision, caused by excessive Pro Tools editing.

DVD seems like it is going to be one of the worst because of its rapid spread. DVD players have been out for almost two years and sales are increasing rapidly now that there is a growing selection of titles, which currently are numbering about 3000. Worldwide unit sales are 7,000,000, with 40,000,000 expected by the end of the year 2000. Second gener-

ation players have overcome some of the shortcomings (no Presidential innuendo intended) of the earlier models and provide plenty of bang for the buck.

Now there is a new system entering the market called Divx. It is basically DVD technology with copy-protected pay-per-view access to titles that you purchase at about \$5 each. These discs will not play on a current DVD player. Circuit City and some lawyers from Los Angeles came up with this bright idea. Have the consumer buy the movie cheap, and make him pay more each time he wants to watch it. So much for compatibility.

IRRECONCILABLE DIFFERENCES

Since I meandered off on to this compatibility tangent, I am reminded of the many times I wanted to smash equipment because of compatibility issues. I won't even talk about the equipment I have shot arrows or .308 NATO rounds into.

Let's talk about CDs. Sony and Philips set up standards for the manufacturing of CDs so that all CD media would playback on any CD player. There were some minor problems at first, like some players refusing to play past 60 minutes (probably something to do with Dan Rather) because of the tracking ability of the player versus the manufacturing tolerances for disc flatness at the outer edges. Then came CD-ROM for computers. Another specification was drafted so that any computer could extract software or data on a CD-ROM.

Then someone got the wild idea to put computer information on the audio CDs and put audio tracks on the CD-ROM discs. A short time later CD-V, or Video CDs appeared, adding one more standard to the pile.

Recordable CDs, or CD-R, became available in 1989. The recorder was \$50,000 and the master tape had to come from a Sony 1630 system, which added up to another \$50,000. The blank CD-Rs cost \$85 each and clients paid \$350 for a CD copy of their mixes.

Currently, in 1998, you can buy a CD-R drive for your computer for as low as \$250 and blanks for \$1 or \$2 each. Manufacturers of CD-R discs have sold over 400 million units this year alone.

COMPATIBILITY PROBLEMS

With all of these different formats, and new DVD audio formats around the cor-

ner, it is a wonder that anything works properly. Here are some of the compatibility problems I have run across; maybe bringing them to your attention will help you to avoid them.

1. CD-R will not play back on 100 percent of CD players. It is more like 80-90 percent. Some car players will not play them. Old CD players are less likely to work than newer incarnations. Some portable CD players have problems. If one player won't play the CD, then try another player. I had one client who owned six CD players, and his CD-R wouldn't play on any of them. Sometimes if you burn another CD-R using a different manufacturer's disc, you might get a combination that works.

2. All CD-Rs are not created equally. Remember that you get what you pay for. Different manufacturers have different quality control standards. Stick with major brands. I bought some CD-Rs for less than \$1 each to use for ref copies and ended up with more errors in a month than I had in the previous ten years.

3. CD-R discs will not play back in the first generation of DVD players. DVD players will play back normal CDs, but not CD-R discs. Most second-generation players will play CD-Rs.

4. CD-ROMs made from CD-Rs have the same set of problems. Every so often I run across a combination where a certain manufacturer's disc will not play on certain CD-ROM drives. I have to try various computers before I find one that will read the disc.

5. First generation DVD-ROM drives will not play back CD-Rs. Second generation players are OK.

6. CD-RW will not read on a CD-ROM drive or audio CD player. Because the reflectivity of a CD-RW disc is close to that of DVD, you can play a CD-RW disc on a DVD player and a DVD-ROM drive. Two wrongs can make a right.

7. A Divx disc will not play on a DVD player because of copy protection, but a DVD disc will play on a Divx player. If you purchase a play for your Divx disc on your player, you can't take it over to your buddy's house and play it on his Divx player. He will be charged also.

THE MASTER IS IN

There are some things to remember
continued on page 176

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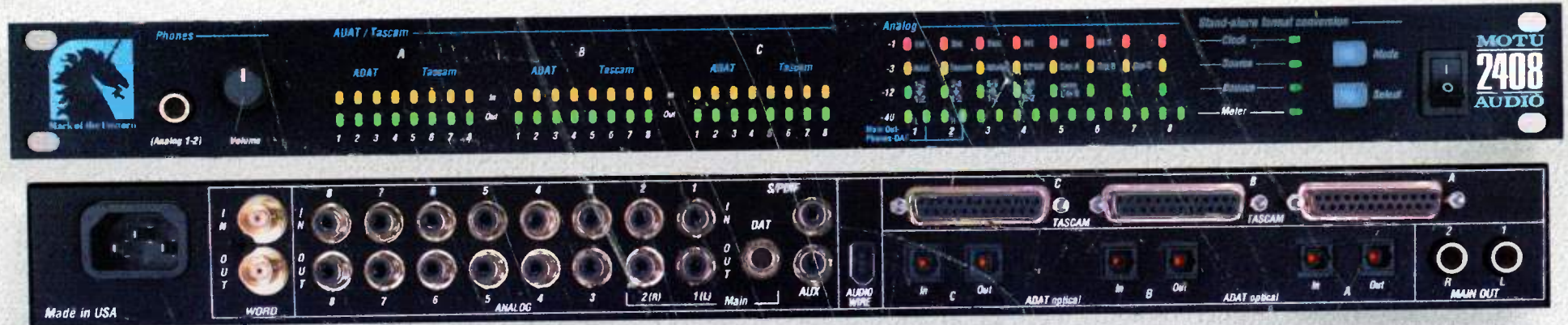
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