EXCLUSIVE REVIEWS: PINNACLE RCD-202 • TB SYSTEMS SOFTMC • APHEX 105 & 106
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EQ

THE PROJECT RECORDING & SOUND MAGAZINE

JUNE 1994

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VOLUME 5, ISSUE 6
JUNE 1994

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MP&A EDITORIAL
Editorial/Design Consultants

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Classified Advertising

RIVA DANZIG
Creative Director

MARK ALHADEFF
Art Director

SUSAN FALCO
Assistant Art Director

FRED VEGA
Production Manager

Editorial Offices
939 Port Washington Blvd.
Port Washington, NY 11050
Tel: (516) 944-5940, Fax: (516) 767-1745

Administrative/Sales Offices
2 Park Avenue, Suite 1820
New York, NY 10016

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LETTERS TO EQ

WHATZ THE STORY?

I was pleased to see some space given to loudspeaker design in the April issue of *EQ*. I was especially intrigued by the text block by Roger Nichols entitled "Design Your Own Speakerz." I immediately wanted to give either WinSpeakerz or MacSpeakerz a try. There was, however, no information given on where to order either program. Calls to all the local computer stores were fruitless, as were calls to several software distributors.

Craig F. Columbus
Ferrum, VA

[We thought EQ readers might like to know how they can obtain their own demo version of MacSpeakerz. Macintosh users can download the MacSpeakerz demo from either America Online or CompuServe. On AOL, use the keyword "MacSpeakerz" to go directly to True Image Audio's Loudspeaker Design Forum where you can find the demo in our software library. On CompuServe, go to the Engineering/CAD Library in the Mac Applications Forum.

The release of WinSpeakerz, the Windows version of The Speaker Design Toolbox, has been delayed. We now anticipate shipping WinSpeakerz in the third or fourth quarter of '94.

For more information, readers can contact True Image Audio at 800-621-4411. From outside the U.S. call 619-480-8961.

Reach us by mail at True Image Audio, 349 W. Felicita Ave., Suite 122, Escondido CA 92025.

Sharon Alsup
Marketing Director
True Image Audio]

LIVIN' LOUD

The letter from Robert Atkinson in your January issue reminded me of when I was playing out regularly. Let me preface this with a word of caution though — your hearing is not indestructible; it is part of your livelihood. If you can't hear well, you won't be able to do your job well. If those in your audience cannot hear well, they won't be coming to hear your music as they will not be able to appreciate it. That said, I offer this true experience for your amusement only.

In the late '60s/early '70s the band I was in would run into the same problem Robert did. We would occasionally be too loud for the bar or high school we were playing at. When we were confronted by the person in charge, we would indicate that we would comply with their request for lower volume. All of us would then go to our amps (SR was "vocals only" for us at this time) and turn them *up* 1/2 to 1 notch. We never got any more complaints about being too loud the rest of the evening.

Ron Carlson
Boone, IA

DISSIMILAR SURROUNDS

Just a couple of quick comments regarding Eddie Ciletti's review of the RSP Circle Surround system.

In the review Mr. Ciletti states that the primary difference between Circle Surround and Dolby Surround is that "the Dolby system includes various DSP functions." Just to set the record straight, Dolby Surround does not include any "DSP function." There is a time delay applied to the rear channel in the decoders in order to increase the subjective front-to-rear separation (via the Haas effect), but I don't think that a simple delay could really be considered DSP. In addition, Dolby Surround uses a modified form of B-type noise reduction to process the rear-channel information in both the encoder and decoder. In addition to reducing surround channel noise, this processing also reduces the audibility of high-frequency signals (such as vocal sibilances) that sometimes leak into the rear channel as a result of errors that can occur in the duplication or broadcast of surround-encoded material. Finally, a Dolby Pro Logic Surround decoder uses signal steering circuitry to increase adjacent channel separation to greater than 25 dB.

William Barnes
Mgr, Licensing Engineering Dept.
Dolby Laboratories Licensing Corp.

CORRECTIONS

In Wes Dooley's "Mixed Media" article in the April '94 issue of *EQ*, the price of the Alesis/TimeLine AI-2 was incorrectly listed. The correct price is $999. Also, in Martin Polon's Fast Forward column the term PCI was explained as Peripheral Connect Interface. It actually stands for Peripheral Component Interconnect.

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SPEAK OUT

Q *How can author Calix Lewis Reneau know that "nine out of ten drivers were damaged by clipping," as he states in his story "First Aid For Loudspeakers, Part 3," on page 96 of the March 1994 issue of EQ?*

What part of the speaker exhibits what characteristic sign that proves the damage was caused by clipping and not the application of too much clean, undistorted power?

I want to know because my speaker dealer says I damage speakers with too much power, not clipping. If I could be sure, by looking at the old speaker parts, that I was clipping, I would get a more powerful amplifier. My dealer says I don't need to spend the money, but I am spending a lot on speaker repairs.

Ann Rilly
Berkley, MI

A If a speaker shows physical damage, it's probably overpowered; if you can't see anything wrong with it, but it still doesn't work, it's clipped. Speakers fail on two fronts: electrical and mechanical. Mechanical failures would be tears and holes, rotted foam surrounds (*very* common), slipped magnets from being dropped, or other such physical damage. Overpowering can cause damage like this. For example, if you hyperextend a speaker, the voice coil will either bottom out (on the backplate of the magnet assembly) and deform (bend), or jump out of the gap entirely and get bent that way. You also might find that a spider has come loose from being overworked, but this is more rare. In any case, clipping will not cause this type of visible damage.

Another way to tell if your electrical-type failure resulted from clipping or overpowering is to look at the voice coil. Trouble is, to see the voice coil you have to dismantle the speaker, effectively ruining it save for a reconing job. If a speaker has failed, however, what have you got to lose? If your dealer is reconing the speakers, ask to see the old voice coil. If the dealer's just replacing the drivers, keep one and cut it open yourself. If the nonworking voice coil is a nice shiny brass one with no apparent defects, then it's been clipped. If you can see blisters in the varnish on the coil, or the coil is blackened, or if the coil has come unwound from the form, you've overpowered it. (The coil might also have failed because the frame warped slightly from abuse and the coil rubbed raw and shorted out on the side of the gap; just another option to consider.)

Remember, clipped or overpowered, the problem is too much heat melting the innards of your driver. Make sure that the ports (in a ported cabinet) aren't blocked and that the insulation in the cabinets (if there is any) doesn't cut off all the air circulation around the drivers.

Unless you're buying really lousy, cheap drivers, though, the problem isn't with the speakers (as your question so aptly implies). The cure, however, might not lie in your amplifier, especially if the problem is clipping. A signal can get clipped anywhere along the signal path, and any DC offset introduced — be it clipping at the amp, an overburdened equalizer, or a faulty signal generator — will cause this type of trouble. Before going to the expense of buying new amps, check to make sure that your signal isn't overdriving an input gain anywhere in the signal path. For example, a common mistake is to just boost a graphic EQ; ideally, the sum of the boost and cut on a graphic should cancel each other out. Otherwise, make sure that your amps and your speakers are properly matched in terms of power output and power handling, in RMS watts. If all else fails, maybe you could just turn it down? Naahhh.

Calix Lewis Reneau
EQ Contributor

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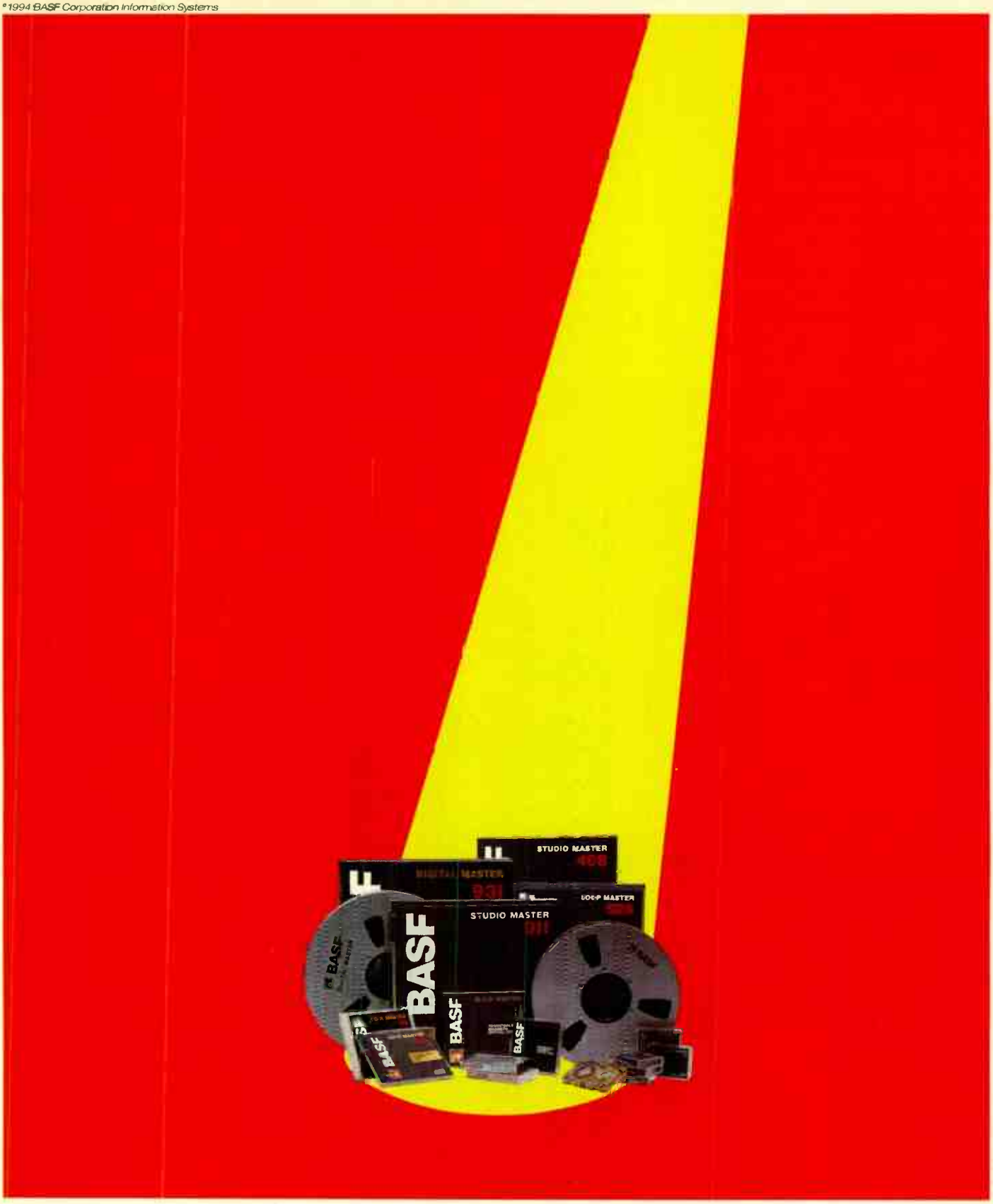

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CIRCLE 12 ON FREE INFO CARD

BY THE BIAS

Q In "A Real Player" (EQ&A, pg. 12, April, 1994), in response to David Solinski's question about pro cassette decks, you compare "variable front-panel bias" and "fixed bias." What about the so-called "auto bias?" How does it work and how does it compare to fixed and variable bias?

Mitchell Dyck
Berkeley, CA

A The auto bias feature found in cassette decks is supposed to automatically optimize the amount of bias for each tape. The machine's internal oscillator alternately generates two signals, typically 400 Hz and 10 kHz. While these are recorded, the output signal at the playback head is monitored. The machine adjusts bias (in record) until the level of both frequencies are equal.

Bias is a radio-type frequency that is mixed with the audio signal to minimize distortion, but, as a side effect, it also greatly affects frequency response. Low frequencies benefit most when bias is properly applied. High frequencies just about record themselves. The optimum bias setting is a bit of a compromise — high frequency efficiency being sacrificed for lower distortion in the bass region (see fig. 1).

Auto bias may seem to be a great convenience, but please note that this feature can only work properly when the heads are within specification. If, for example, the head is worn, the response at 10 kHz could be down by as much as 5 dB. Auto bias can not compensate for this but would attempt to "flatten" the response via bias, considerably raising the distortion.

For fixed-bias decks, users must find

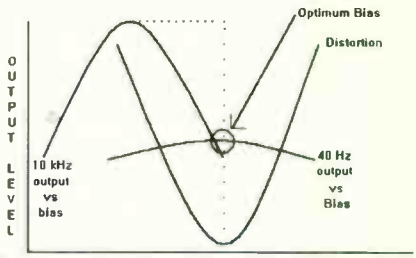

Figure 1: In addition to minimizing distortion, bias affects low frequencies differently than highs.

the tape that works best with that deck, or have the deck professionally adjusted to your favorite tape. User-variable (external) bias decks have more flexibility provided the adjustement is properly made. All decks suffer from the same shortcoming: once the head is out of spec adjusting bias cannot bail you out.

Eddie Ciletti
President; Manhattan Sound Technicians

DIRECT TO THE SOURCE

Q I wanted to record guitar directly into the console, so I plugged it into the line input, which sounded horrible. So I tried the mic input, and it sounded horrible and distorted. What's so great about going direct, anyway?

"Ace" Werner
Baltimore, MD

A Going direct requires an impedance converter between the guitar and console. This is because a guitar is a high-impedance device whereas console inputs generally have low-input impedances. These load down the guitar, resulting in a loss of volume and high frequencies.

Small Wonder

ASHLY has established a solid reputation for building top quality amplifiers that sound great and hold up under even the most rigorous operating conditions. Our rugged, single rack space SRA-120 professional stereo power amplifier continues in this tradition, delivering a solid 60 watts per channel into 4 ohms stereo, 45 watts per channel into 8 ohms stereo, or 120 watts total into 8 ohms mono-bridged, with low distortion and excellent overload behavior. Turn-on delay and instantaneous turn-off circuitry eliminate any transients to the speaker. Rear panel input connections may be made via 1/4" balanced phone jacks or barrier strips with ground lift provision. The compact SRA-120 is suitable for applications such as small control room monitor systems, headphone distribution amps, or driving the high end of a bi-amplification setup. All ASHLY products are fully covered under the Company's exclusive Five Year Worry-Free Warranty program.

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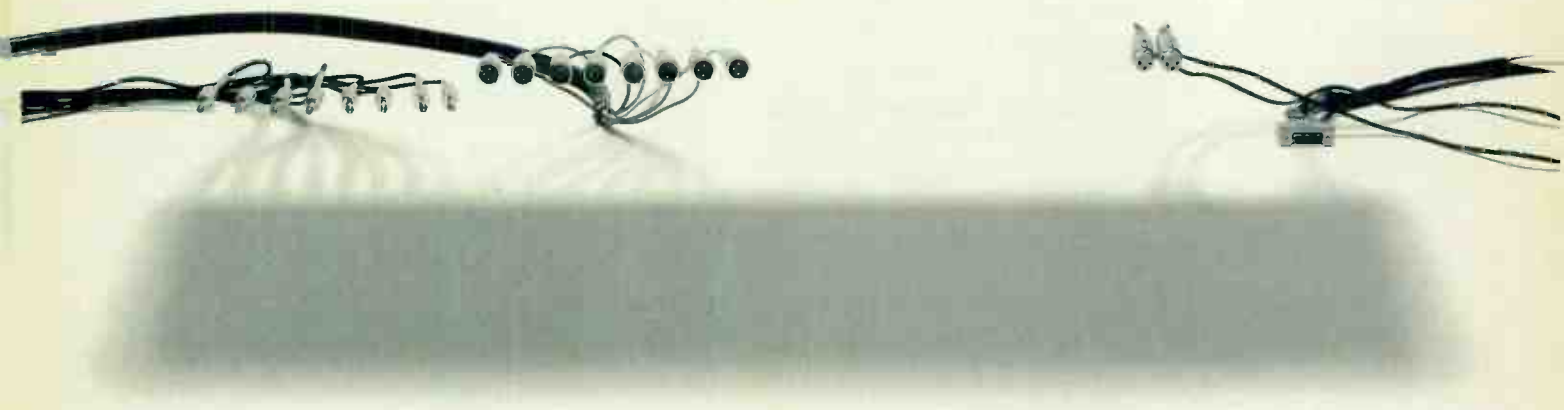
If You Think You Know Tascam Mixers,

You Ain't Seen Nothin' Yet.



TASCAM re-invents itself on the personal and project studio recording scene.
It all started with a desire to improve the sound of TASCAM mixers to meet the demands of digital recording.
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From Vintage to Modern.
There are 49 factory presets and 49 user-definable programs. Presets pay tribute to such distinctive sounds as Hendrix and Van Halen I, B.B. King and Stevie Ray Vaughan, Santana and Metallica, Queen and Pantera. There are 10 bass style settings, ranging from traditional jazz to Yes, from slap to King's X.

Effects Loop "50/50" Switch.
Preserves signal integrity. When engaged, Effects Loop runs in parallel with the internal signal path of the SansAmp. The dry signal remains in the PSA-1 and is not subject to A/D conversion or other signal degradation.

Universally Friendly.
Parameters are adjusted manually in real time with standard/analog potentiometers. You just play the instrument, turn the knobs until you like what you hear, and save it. The exact position of each pot is then stored in the memory. To find the preset position of any particular pot, arrow indicators guide you directly to that point.

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Enables signal to be compatible with full-range systems as well as guitar and bass speaker cabinets.

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E&A

A guitar, unless it has active pickups or other onboard electronics, typically wants to feed a 150k-or-higher input impedance. Although you can use a standard direct box or transformer, many signal processors have a suitably high input impedance and can be used instead. Consult the owner's manual for the input impedance spec.

Another option is the "Direct Interface," a construction project I wrote up in the June 1991 *EQ*. This direct box is designed specifically for guitar and can feed balanced or unbalanced low-impedance inputs. A kit of parts is available from Paia Electronics (3200 Teakwood, Edmond, OK 73013) for $55.90 plus $5 shipping.

Craig Anderton
Technology Editor; *EQ*

GOING MOBILE

Q *I am a mobile DJ. I want to connect my preamp-stereo mixer to my power amp. However, the outputs from the preamp-mixer are unbalanced RCA jacks while the inputs on the power amp are XLR balanced jacks. (The output of the mixer at full volume is 560 millivolts, but the amp's input sensitivity is 1.5 volts.) What's an easy solution?*

Roosevelt A. Anderson
Las Vegas, NV

A You are actually facing two interface problems: one involves the connectors and cables as you mention, but the other more serious problem is one of level mismatch. You could make up special cables to apply the hot and ground from the single-ended RCA output to the + and – balanced inputs, but you still wouldn't have enough signal level to drive the amplifier to full power. What you need is an interface amp, or as they are more commonly known, a "bump box." Peavey offers two versions: an 8-channel (IA8410) and a 2-channel (IA10/4), each capable of converting a single-ended –10 dBV (.316V) up to +4 dBu (1.23V) and +4 balanced back down to –10. In your application, the IA10/4 would step up your 560 mV to just over 2V, so your mixer will drive your amp to full output with a few dB margin. The IA10/4 will accept RCA inputs and give you XLR outputs.

Levin Culpepper
AA Sales/Service Coordinator
Peavey Electronics

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To further improve sound control, we've widened both the high and low parameters of the shelving EQ. So, when making EQ adjustments, the results are smoother and more musical. Bass is punchy, without tubbiness, and highs sparkle without fatigue-causing graininess. The M-2600 combines this Enhanced Shelving EQ with two sweepable mids on each channel.

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AND THAT'S JUST A PREVIEW!

The M-2600 is optimized for recording, and has literally dozens more application-specific features that make recording and mixing quicker and easier than ever before. So visit your dealer soon. Hear Absolute Sound Transparency and check out the first of a new breed of TASCAM mixers.

MORE HEADROOM TO HANDLE HOTTER SIGNALS

Distortion's great coming out of a guitar rack, but not from your mixer. That's why we've built an incredible amount of headroom into the M-2600. More than you've come to expect from TASCAM. You can drive the M-2600 with hotter signals — no distortion. Allowing you to unleash a wider dynamic range from your gear, confident signals won't be clipped, lost or the quality compromised.

PLUS

8 bus design, group/direct out switching on every channel, fully-assignable split EQ, 2 independent stereo cue mixes while tracking, 8 independent aux sends, 6 assignable stereo returns, "flip" signal assignment, and much more! Models available are: M2600/16 ($2,999), M2600/24 ($3,799) and M2600/32 ($4,699). Check them out.

TASCAM®

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ABSOLUTE SOUND TRANSPARENCY AST

7733 Telegraph Road, Montebello, CA 90640 (213) 726-0303

CIRCLE 57 ON FREE INFO CARD

World Radio History

©1994 TEAC America, Inc

EQ PRODUCT VIEWS

EMT FOR THE '90S

EMT, the renowned echo plate maker, just introduced the 248 digital audio processor. This 2U device offers a wide range of natural-sounding, full-bandwidth reverb effects that simulate settings from cathedrals and concert halls to small rooms and stairwells. The 248 also provides echo, delay, stereo synthesis, M/S decoding, and stereo channel balance in the digital domain. In addition to the standard programs, optional ones can be loaded via plug-in cartridges that insert into a front-panel slot. For further information, contact G Prime Ltd., 1790 Broadway, New York, NY 10019. Tel: 212-765-3415. Circle EQ free lit. #101.

HIGHLY EFFECTIVE

TOA has just premiered the DACsys II line of digital audio control products. The line is comprised of two signal processing devices (the DP-0202 and DP-0204) and the DP-0808 8 x 8 analog matrix/mixer. The DP-0204 is a single-rack unit that houses 1/3-octave equalizers, signal delays of 1.3 seconds on each input and output, polarity reversals, full-functioned compressor/limiters, 8- and 16-band parametric equalizers,

notch filters, symmetric and asymmetric crossover filters, attenuation/gain controls, noise gates, high- and low-frequency shelving filters, and CD horn equalizers — all of which can be simultaneously accessed. Equipped with both analog and digital ins and outs, the unit is configured with proprietary software that will be available for MS-DOS, Windows, and Macintosh platforms. The digital ins/outs use the standard AES/EBU format, while 20-bit A/Ds and D/As provide a dynamic range of 107 dB. Sampling rate is 44.1 kHz. RS-232C and RS-485 ports provide control of up to 30 units at a time. A MediaLink interface will also be made available. The DP-0202 is equipped with essentially the same functions, but with two ins and outs. Computer controlled as well, the 8 x 8 matrix/mixer combines, splits, routes and attenuates incoming signals. It will operate with the DP-0202 and 0204, or can function as a stand-alone unit in other systems. For complete details, contact TOA, 601 Gateway Blvd, Suite 300, South San Francisco, CA 94080. Tel: 415-588-2538. Circle EQ free lit. #102.

MORPHING MUSIC

The Vortex Audio Morphing processor from Lexicon is a radical new digital sound processor. Among its innovations is its ability to "morph" from one effect to another, allowing unique sonic ideas to germinate. Lexicon's Audio Morphing effects technology generates a complete parametric and algorithmic restructuring of two independent stereo effects. The results are sounds that are way beyond a simple crossfade. The morph time can be from .01 to 10 seconds. Or use your expression pedal to morph in real time. This 1U device features 32 stereo effects, 26 algorithms, 16 variable parameters per effect, 32 user programs, dual-tap tempo echoes, 64 rhythmic divisions, dual quadrature LFOs, an input envelope follower, and remote amplifier switching. For complete details, contact Lexicon, 100 Beaver St., Waltham, MA 02154-8425. Tel: 617-736-0300. Circle EQ free lit. #103.

MINI MICROTECH

Microtech Gefell's new M300 is a miniature cardioid condenser mic. Featuring a trim, compact design, it's well suited for project studios needing an affordable mic for acoustic instruments, but also performs in other applications, including sound reinforcement. The M300's capsule is unique in design, consisting of a ceramic chrome-plated black electrode and gold-sputtered membrane. Overall frequency response is said to be accurate, with a smooth, gradual high-frequency rise between 2 kHz and 15 kHz in the order of 2.5 dB. Off-axis response is promised to be uncolored and natural sounding. The M300 requires standard 48-volt phantom powering. Price is $495. For more information, contact G Prime, 1790 Broadway, New York, NY 10019. Tel: 212-765-3415. Circle EQ free lit. #104.

World Radio History

Serious Automation

CS2000

Digital Control Studio System

The new CS2000 digital control studio system from Euphonix leads the industry in computer aided mix management. With the powerful Version 2.0 software the CS2000 incorporates features that take it beyond any other system on the market.

Screen based interactive graphics supplement the controls and indication on the console surface. Intuitive displays provide the engineer with instant feedback on session and mix status.

The system includes SnapShot Recall™, for instantly resetting everything on the console, and an updated Total Automation™ mixing package.

Total Automation has many new and innovative features. Play back a mix and all console settings are instantly recalled together with the dynamic automation. Over 99 levels of undo are instantly available to the engineer in the form of mix passes.

The new template software allows the engineer to preset the level of automation for every control on the console. Those familiar with conventional systems can simply start by automating lower faders and mutes, moving on to upper fader, pan, aux send, and input gain automation when the session demands it.

For total control and creative flexibility, no other system competes with the CS2000.

Euphonix

Worldwide Sales: 10647 Riverside Drive, N. Hollywood, CA 91602 • (818) 766-1666 • FAX: (818) 766-3401
U.S. Central Region: 1102 17th Ave. South, Suite 202, Nashville, TN 37212 • (615) 327-2933 • FAX: (615) 327-3306

CIRCLE 24 ON FREE INFO CARD

World Radio History

EQ PRODUCT VIEWS

ALL THINGS BEING EQUAL

New from Yamaha are the YDG2030 2-channel digital graphic equalizer and the YDP2006 digital parametric equalizer. The YDG2030 is a 30-band unit with four notch filters, HPF, and LPF. The YDP2006 operates in mono and stereo modes. In stereo mode it provides 2-channel 6-band parametric EQ, four notch filters, HPF, and LPF. In mono mode, the YDP2006 provides single-channel 12-band parametric EQ, eight notch filters, HPF and LPF. Both models feature 2-channel analog –20 dB/+4 dB switchable XLR-type ins and outs, and audio integrity is maintained through 20-bit A/D and D/A conversion at 44.1 kHz sampling frequency. Variable output delay of up to 730 ms is provided for time alignment, distance compensation, etc. The front panels feature LCD screens for displays of parameter values and graphic representations of EQ curves. Contact Yamaha, Audio, Guitar and Synthesizer Division, P.O. Box 6600, Buena Park, CA 90622-6600. Tel: 714-522-9011. Circle EQ free lit. #105.

ROCK 'N' ROLL-OFF

The Optimizer, manufactured by SPL, is a parametric equalizer. It offers four parametric equalizers, each individually assignable to ranges from 10 Hz to 23 kHz, all with high-pass, low-pass, band-pass, and notch filters. The unit utilizes a "proportional-Q" equalization technique for precise, yet musical equalization. Perhaps the most interesting feature of the Optimizer is its variable roll-off response, which varies the slope characteristics around the center frequency from "gentle" to "steep" — not unlike fading gradually from a 2d order filter to a 4th order filter. The Optimizer also features an output control for each band with a range from –60 dB to +5 dB. For further information, contact beyerdynamic, 56 Central Ave., Farmingdale, NY 11735. Tel: 516-293-3200. Circle EQ free lit. #106.

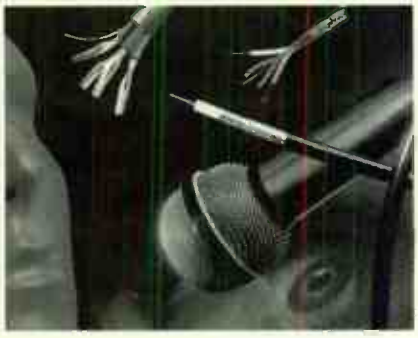
IF SILENCE IS GOLDEN, THIS CO

The D&R Orion. From its Hi-Def™ EQs to its fully modular design, from its custom-welded RFI-killing steel frame to its incredibly flexible floating subgroups, the handcrafted Orion is every bit a D&R.

World Radio History

ABLE CABLE

The new series of Belden Brilliance audio and video cables is designed for use within the latest digital A/V technologies. The line includes cables that meet all current AES/EBU requirements, as well as the requirements of the emerging serial digital video technologies. Belden's new 1696A high flex AES/EBU digital audio interconnect cable has been designed to 110 ohms to permit error-free transmissions of 3 and 6 MB/sec digital audio over extended distances. The cable is shielded for improved noise immunity and features a drain wire for shield termination, as well as a crush resistant high-density insulation. To find out more, contact Belden, 9 N. Vail Ave., Arlington Heights, IL 60005. Tel: 708-577-8505. Circle EQ free lit. #107.



PEAK CONDITION

The new Furman PM-8 power conditioner/monitor provides all the power conditioning protection that the company's popular PL-PLUS does, but for applications where the PL-PLUS's pullout lights are not needed. The PM-8 assists in monitoring AC line status by including an AC voltmeter (90–135V) and an RMS-reading AC ammeter (020A). It's rated at 15 amps. Clean, filtered power is provided by advanced conditioning circuitry. Eight widely spaced rear outlets that can accommodate bulky plug-mounted power supplies are controlled by a lighted front-panel master switch. Retail price is $199. For more information, contact Furman Sound, 30 Rich St., Greenbrae, CA 94904. Tel: 415-927-1225. Circle EQ free lit. #108.

REVISED STANDARD

The original dual-channel NEI graphic equalizer has undergone a major renovation. The new NEI 1520 has two independent channels with 15 ISO equalization bands and EQ-In/EQ-Out switches for each. In addition to the balanced and unbalanced jacks for each channel, the 1520 incorporates an easily serviced modular PC board and low-noise IC chips. Features include XLR ins and outs, independent variable gains, precision mounted slide pots, and peak indicators. For more info, contact NEI, Division BXG International, 5337 N. Marine Dr., Portland, OR 97203. Tel: 503-289-3182. Circle EQ free lit. #109.

NSOLE SHOULD COST 7486% MORE

Next time you audition a console, from anyone at any price, ask to hear a test for which we're well-known. It goes like this: We select 'mic' across the board, and assign every channel to the mix bus. We crank up the studio monitor amp, all the way. We push up all the channel and master faders, all the way. We turn the console's monitor level up. All the way. Next, we invite each customer to place his or her ear right next to one of the monitor's tweeters.

Gingerly, they listen, to not much at all.

Then, we bring the monitor pot down from what would be a speaker-destroying level to a merely deafening level. Before ears are plugged and music blasts forth, we invite one last, close listen, to confirm the remarkable: Even with everything assigned and cranked up, a D&R console remains effectively — and astonishingly — silent.

Of course, a D&R is much more than the quietest analog board you can buy. So we equip each handcrafted D&R with dozens of unique, high-sonic-performance features. And we back each board with our renowned factory-direct technical support.

How much is all of this worth? Well, if silence is golden, then every D&R is worth its weight in gold.

In which case, until we raise its price about 75 times, the D&R console pictured at left is one truly impressive investment opportunity.

D&R

D&R ELECTRONICA B.V.
Rijnkade 15B, 1382 GS Weesp, The Netherlands
tel (–) 31 2940-18015 • fax (–) 31 2940-16987
D&R WEST: (818) 201-5855 • D&R NASHVILLE: (615) 661-4892
D&R SOUTHWEST: (409) 756-3737 • D&R USA: (409) 588-3411

D&R handcrafts consoles for recording, live sound, theatre, post-production and broadcast, for world-class to project facilities. "Weight in gold" comparisons based upon 11/93 market prices.

CIRCLE 20 ON FREE INFO CARD

World Radio History

A Digital Mixer for Under $2000?

That's the question Yamaha's new ProMix 01 digital mixer will put on many people's lips

BY WADE MCGREGOR AND HECTOR LA TORRE

We always knew we would be using digital mixers. We just didn't know when. Well, as far as Yamaha is concerned, the future is now. And this future costs under $2000.

In a perfect live setting — the hot, new music club, House of Blues, right off Sunset Boulevard — the Yamaha ProMix 01 digital mixer with automation, memory, digital signal processing and MIDI capability was introduced to industry professionals, press, and salivating third-party software developers. The verdict? Yamaha has packed enough features into the ProMix 01 to make it very hard to continue choosing analog.

We stick with our trusty analog mixers because of the way they sound, right? Good quality analog mixers are quiet, have good equalization, and offer lots of headroom. Yamaha expects to change our belief that we can't afford a digital mixer with this kind of performance (and more) when the ProMix 01 begins shipping in August, 1994. They've developed digital technology to a point where they can now include the important features of our favorite analog mixer at a comparable — or lower — price. Yamaha has reached this goal by creating a new DSP chip that provides tremendous audio processing power packaged in a compact (4.92" H x 19.05" D x 17.16" W; 26.4 lbs), rack-mount mixer. In order to achieve the dynamic range and noise performance (>105 dB dynamic range) that rivals that of analog mixers, the ProMix 01 uses 20-bit A-to-D and D-to-A conversion with oversampling (64 times in; 8 times out).

Parametric equalization is the most powerful tool we can use to shape the tone and fix frequency-domain problems with sources. But parametrics are difficult to tune precisely and hard to match in stereo pairs. In the ProMix 01, a backlighted LCD screen displays the precise setting of the parametric equalization (available on all inputs and the stereo output), while the settings can be stored exactly for recall at any time or mirrored on adjacent channels when mixing stereo inputs.

Wouldn't it be nice if your mixer would remember every single control setting so that you could pick-up right where you left off? In addition to recalling the mixer's settings, the ProMix 01 also returns the onboard digital effects and dynamics processors to their exact settings.

Complete MIDI dynamic-automation control enhances the onboard storage of complete console-setting snapshots. The ProMix 01 can store up to 50 of these "scenes" internally for recall from the front panel or via external MIDI program change commands. A MIDI sequencer can be used to store the MIDI data from the ProMix 01 to automate mixes in sync with video, audio, and virtual tracks, both onstage and in the studio. The extensive MIDI features of the ProMix 01 will also allow it to function as a MIDI remote control for external MIDI devices.

A new design of moving faders allow both novice and seasoned users to always know at a glance where their mix is going. The motorized faders can be assigned to four sub-groups, each under the control of a single fader. Digital signal routing provides versatile access to two digital effects processors and three stereo digital compressor/gates, onboard. This offers the distinct advantage of storing all mix information.

The 20-bit A-to-D conversion of the ProMix 01 can be directly interfaced to most DAT machines, affordable digital multitracks, and hard-disk recording systems that include the common S/PDIF digital interface. For the analog world, there are 16 balanced line and mic inputs (eight with XLRs and phantom power), a dedicated stereo input, four auxiliary sends (two internal and two with analog outputs), and three stereo outputs (balanced +4 dBm, and unbalanced –10 dBV).

For the price of two medium-priced digital effects processors, Yamaha will throw in three stereo dynamics processors, a digital patchbay, and a fully digital mixer with moving faders. With a list of features longer than the 11 rack-units this mixer fills in your studio equipment rack, the ProMix 01 may be able to redefine the meaning of cost-effective audio gear. EQ

World Radio History

Accept no substitute
(there isn't one)

There is no other console like BIG in the world. For a moderate price, we deliver a comprehensive audio system with full-specification AMEK automation and Recall.

BIG's audio architecture has complete facilities for all types of creative audio production.

☞ Dual-path modules in the 28 or 44 position chassis provide 56 or 88 inputs.

☞ The standard console includes 4 stereo line inputs and 4 stereo FX inputs.

☞ 12 busses selected to 24 outputs, Direct outs and 8 Aux sends provide massive routing flexibility.

☞ EQ is similar to the famous and much-loved AMEK ANGELA 4-band device.

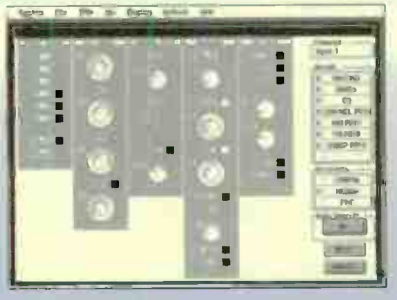
AMEK SUPERTRUE automation is a powerful part of BIG's equipment and is one of the world's leading systems with a user base of over 600 installations.

☞ SUPERTRUE gives complete SMPTE-locked control over faders and mutes; up to 10 VCA groups can be configured.

☞ Extensive automated solo modes allow additive and subtractive mixing using mutes and solos in various combinations.

☞ SUPERTRUE has a range of on- and off-line editing systems including the forthcoming Mix Processor which allows Mix Data to be Spliced, Merged, Shifted, Erased or Extracted and Channel Data to be Swapped, Copied or Trimmed.

☞ The Cue List allows a range of Events both inside the console and externally (via MIDI) to be triggered from time code.



Unlike any competing product, BIG has a Recall system which allows you to store the positions of module controls. This means you can reset the console surface at some later time, allowing you to recreate and modify mixes as required using the graphic screen display or the unique Voice Prompt, which talks you through the console.

Finally, AMEK VIRTUAL DYNAMICS is an option. This proprietary software-based envelope shaping system allows you to select a digitally-controlled Dynamics device, such as a Compressor, Gate, Limiter, Expander or Autopanner to each VCA fader from a menu.

BIG by Langley

Head Office, Factory & Sales:
AMEK Systems & Controls Ltd.,
New Islington Mill, Regent Trading Estate, Oldfield Road, Salford, M5 4SX, England.
Telephone : 061-834-6747.
Telex: 668127.
Fax: 061-834-0593.

AMEK US Operations:
10815 Burbank Blvd., North Hollywood, CA.91601, USA.
Telephone: 818/508 9788.
Fax: 818/508 8619.

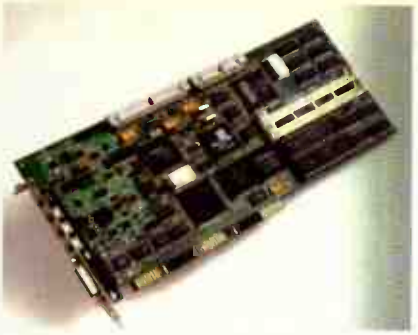
AMEK Deutschland GmbH:
Vorstadt 8, 6530 Bingen
Germany
Telephone: 06721 2635
Fax: 06721 13537

AMEK

CIRCLE 06 ON FREE INFO CARD

World Radio History

EQ STUDIO WARE

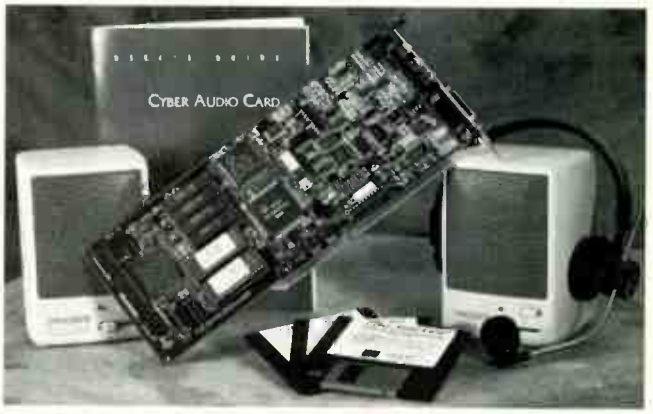


CHAIRMAN OF THE BOARDS

SoundTrax is a high-performance sound card with DSP from Kalix, Ltd. Ensoniq Soundscape technology is employed for audio playback and record, and for true-to-life wavetable synthesis. Everything is 16-bit, including record/playback and synthesizer samples. SoundTrax uses the same chipset as the Ensoniq ASR-10 synthesizer. Voices from the Ensoniq sound library are also included. Hardware-based wavetable synthesis, with 16-bit sample resolution, and general MIDI compatibility allows for 32 polyphonic notes and 32 simultaneous voices. Sample rates are 44.1, 22.05, 32, 48, and 11.025 kHz. DSP effects are provided by Kalix Sound DSP. Price is $349. For more details, contact Kalix, 1406-B Crain Hwy. South, Suite 302, Glen Burnie, MD 21601. Tel: 410-553-6771. Circle EQ free lit. #110.

WHAT A CARD

Alpha Systems Lab (ASL) is delivering the first sound card with 3D surround built in — the Cyber Audio/SRS. Three dimensional sound, using the patented SRS technology from SRS Labs, allows surround sound from only a single pair of stereo speakers. The Cyber Audio/SRS card features advanced voice recognition that eliminates mouse and keyboard commands. The Cyber Audio/SRS is fully MIDI compatible with 16 MIDI play/record channels at 16-bit, 44.1 MHz resolution. For complete information, contact ASL, 2361 McGaw Ave., Irvine, CA 92714. Tel: 714-252-0117. Circle EQ free lit. #111.



ACCESSIBLE APPLE

Industrial Computer Solutions's new ICS 7650 is a rack-mount chassis for Macintosh Quadra 650 and Apple IIvx, adding to the company's continually growing line of computer rack-mount products. The ICS 7650 is made of 16-gauge steel and measures 17 x 7 x 17 inches (WxHxD) with a 19-inch front panel. The unit allows all card access, cable access, disk drive access, and access to reset buttons as conveniently as the standard Quadra does. The ICS 7650 is of modular design for easy customization, as well as repair, by removing the five captured screws from the top cover and rear panel. With the top cover and rear panel in place, the Quadra 650 remains captured within the chassis by the use of rubber and foam shock mounting material. And custom colors and logo generation are available. For further information on ICS products, contact Industrial Computer Solutions, 236 Bergen Blvd., W. Patterson, NJ 07424. Tel: 201-256-7272. Circle EQ free lit. #121.

DIRECT-TO-DESK RECORDING

Studer's MultiDesk for Dyaxis II is an advanced control surface designed to greatly improve speed, accuracy and ease of use of the sophisticated DAW. The MultiDesk strikes a balance between virtual and physical workspaces with seamlessly integrated moving faders, precision editing, and scrub controls via MultiMix software. And because MultiDesk is assignable, it can control and automate up to six Dyaxis II processors for up to 24 channels of audio recording and playback — all within less than 5 feet by 2 feet. For further information, contact Studer Editech, 1370 Willow Rd., Suite 201, Menlo Park, CA 94025. Tel: 415-326-7030. Circle EQ free lit. #112.

World Radio History

THE EQ 5-MINUTE INTERVIEW: TOM OBERHEIM

EQ: Are you surprised that "vintage" analog synthesizers have made a comeback?
Oberheim: No, they had simply been pushed to the background by the convenience and proliferation of digital machines.
EQ: How does the new Marion Systems synthesizer connect your analog past with the digital present?
Oberheim: The essence of the Marion Systems MSR2 is the mainframe concept that allows the user to combine synthesizers of different technologies in one machine. The machine that we are bringing out, the MSR2, is more than just an analog synthesizer. The first module that plugs into the MSR2 is analog technology, but the machine won't be limited to that.
EQ: What's your reaction when people say today's synths "all sound the same"?
Oberheim: They're not listening. They should try doing some of their own programming.
EQ: What do you think is the most desirable characteristic of analog technology that digital technology has been unable to duplicate?
Oberheim: Controlled uncertainty or the pseudorandom nature of what's going on. I think that's part of the reason why a good analog machine has what one would call a fat sound. Analog synthesizers aren't perfect, and as long as they're not too imperfect, I think that accounts for their unique sound.
EQ: You've seen a lot of shakeouts in the synth industry: Moog, ARP, Oberheim, Sequential. What caused so many manufacturers to fail?
Oberheim: Management problems. Each company seemed to have different management problems.
EQ: It would appear that a lot of the action in keyboards is shifting back to the U.S., when you consider new offerings from Kurzweil, E-mu, Peavey, Ensoniq, and yourself. Do you think this is the case, that it's a trend?
Oberheim: Well, I don't think it's a trend. I think the proliferation of digital machines, especially from outside the U.S., has been a little numbing and has provided an opportunity to fill niches, but I think it's only temporary.
EQ: What do you see as the biggest thing facing today's synthesizer scene, either musically or technologically?
Oberheim: Innovation. Machines of the late '70s and early '80s were truly different from one another, but I think that the success that many companies have had in the business has to some extent limited innovation because big companies are often afraid to innovate. They feel they have to keep the status quo.

Photo by Steve Jennings

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CIRCLE 25 ON FREE INFO CARD

World Radio History

Yello Fever

STUDIO NAME: View and Vision Studios
LOCATION: Malibu, CA
KEY PEOPLE: Dieter Meier (owner); Martin Kloiber (head engineer) [shown]
CREDITS: Meier and Boris Blank form the postmodern duo Yello. Their music can be heard on their seven albums as well as on several feature films, including *Ferris Bueller's Day Off*. Meier is currently producing two films in his studio, *Once Upon A Dream* and *Marilyn, My Love*.
CONSOLE: Euphonix CSII 9656 with DSC version 2.3
SUBMIXER: Mackie 1604 with OTTOmix Automation
MONITORS: KRK 9000 and 6000; JBL 4425; Yamaha NS10; Alesis Monitor One
AMPLIFIERS: Audire; Hafler; Marshall; Fender
RECORDERS: Alesis ADAT (40 tracks); Tascam DA60 DAT machine with timecode card; Tascam DA30 DAT machine; Sony DAT machine
COMPUTERS & SOFTWARE: IBM 486 PC; Macintosh Quadra 900, Quadra 950, and 840AV; Digidesign Pro Tools (8 tracks); Avid AudioVision (8 tracks); Cubase Audio; Opcode Vision; Sound Designer; Digidesign DINR; Opcode Galaxy with editors
MIDI: Mark of the Unicorn MIDI TimePiece II; MAX
HARD DRIVES: Dynatek; PCT; MountainGate removable (up to 26 GB)
EFFECTS: Lexicon 300, VORTEX, and LXP-1; Eventide DSP 4000; Ensoniq DP/4; RSP Intelliverb
OUTBOARD GEAR: Drawmer; HöfAudio; Behringer; Focusrite
MICROPHONES: Neumann; AKG; Sennheiser; Shure
SOUND MODULES: Roland; Yamaha; Korg; E-mu; Alesis; Digidesign
SYNCHRONIZER: MicroLynx
VIDEO: Avid Filmcomposer 5.x and AudioVision
VIDEO MONITORS: Sony, Mitsubishi
EQUIPMENT NOTES: Kloiber states: In Europe, we don't share this philosophy of the NS10's. The KRK 9000's are very accurate and linear, but not many people have them. When you get to know them, however, you like them. They are reliable speakers with a good low end.

The Euphonix's Total Recall system offers us a lot of advantages because we are doing audio and video simultaneously. Plus, with the studio controller I can have access to all my effects from the console. That is a great convenience.

Meier adds: We have a second studio in Zurich where my partner Boris works. With the Euphonix, we can shift the mix over the phone lines from studio to studio.
STUDIO NOTES: Meier continues: The main idea in building this studio was to give back the production abilities to creative people. In the larger commercial studios, you had to communicate through many people and the creative process was lost. Here, we give the fiddle back to the fiddler.

The studio has an amazing view of the Pacific Ocean. And when you're mixing, all you can see is the monitors and ocean. It is an ideal place for living and working. EQ

AN AMAZING OCEAN VIEW, KRK, AND EUPHONIX MAKE YELLO'S PROJECT STUDIO AN AUDIO/VIDEO HAVEN

Photo by Ed Colver

World Radio History

TOPAZ. Our reputation for innovation and excellence in high-end multitrack consoles affords us a singular perspective on the art of recording and mixdown.

Insights gleaned over the years have led to Topaz 24, a 48-input in-line console designed with the sonic integrity and smooth, responsive operation of our most prestigious recording consoles.

MORE EQ. Others may claim to offer "British EQ," but we deliver the real thing, and more of it. Not only Soundtracs' world-class 4-band EQ with dual swept mids, but also dedicated EQ on all tape monitors without compromising your primary equalization.

MORE CONTROL. In addition to a logical, fully implemented control surface, Topaz includes SOLO and MUTE functions on all tape monitors, a critical feature in cutting through the mix to isolate problems, something our competitors may have overlooked.

MORE FLEXIBILITY. Our "Floating Bus" design enables you to route Topaz's 8 group outputs to all 24 inputs of your tape machine(s) without repatching. A comprehensive meter bridge is also available as an option for both the 24- and 32-channel Topaz.

MORE AUTOMATION. When it's time to automate, we give you the professional option of 12-bit, high-resolution VCA/Mute automation with 4,096 increments on each fader to eliminate "zipper noise."

Topaz from Soundtracs. Our track record with big boards allowed us to design the first 8-bus console with everything you need. For more information, call (516) 932-3810 or fax to (516) 932-3815.

TOPAZ BY SOUNDTRACS PLC
Surbiton, Surrey, England

Suggested list price for Topaz 24-channel: $3,995; Topaz 32-channel: $4,995. Soundtracs is exclusively distributed in the U.S. by Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068. ©1994 SAMSON

World Radio History

CIRCLE 48 ON FREE INFO CARD

beyerdynamic M 88 TG

Take a close-up listen to this live-sound choice

MICROPHONE NAME: beyerdynamic M 88 TG
TYPE OF MIC: Dynamic, moving coil
POLAR PATTERN: Hypercardioid
FREQUENCY RESPONSE: 30 – 20,000 Hz
OUTPUT IMPEDANCE: 200 ohms; balanced
SONIC QUALITIES: The M 88 TG's low-end capability and extended response produce a clear, warm, and "natural" sound more usually associated with condenser mics.
STREET PRICE: $395
HISTORICAL NOTES: beyerdynamic is located in Heibronn, Germany and was founded by Eugene Beyer. Fred Beyer now runs the family-owned business.

The market introduction of the original M 88 was in 1963 in Australia, at a conference attended by Queen Elizabeth. At that time, the M 88 was available with a silver-colored grille, but has now evolved into having an all-black finish for a lower profile on stage — hence the M 88 TG.

APPLICATIONS: An obvious choice for lead vocalists, the M 88 TG operates best when used close-up. The M 88 TG can also be used for studio vocals as well as on stage. It is also suited for miking drums, electric guitars, woodwinds, and brass, particularly in high-volume situations.

USERS: The M 88 TG is consistently featured in *Pro Sound News*'s Listing as being used in six or seven out of every ten major tours in the U.S. Phil Collins prefers the M 88 TG to large-diaphragm condensers for recording sessions.

Users (past and present) include Phil Collins, Janet Jackson, Elton John, U2, Billy Joel, Aerosmith, Duran Duran, Paul Young, Eric Clapton, David Bowie, Maze, J.R. Robinson, Robert Cray, Kim Wilson, Charles Aznavour, Bobby McFerrin, Suzanne Vega, Peter Erskine, Udo Jürgens, and Howard Carpendale. EQ

Photo by Ed Colver

World Radio History

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64 Voices
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CIRCLE 03 ON FREE INFO CARD

World Radio History

Scratch That Scratch!

How to take the "THOK" out of your sampled LPs and get some use out of those old, scratched, seemingly useless albums

BY CRAIG ANDERTON

Attention LP loop lifters and venerators of vintage vinyl: there is a way to turn back the clock and minimize those pesky clicks and pops that have always been part of the vinyl listening experience. Just do a little digital surgery, and the scratch will be history.

Of course, if you're using ultra-cool drum loops from ancient R&B records, you might want to leave in some of the authenticity of surface noise and crackles, but it's definitely worth excising the really nasty clicks that sound as though someone's playing a very weird percussion instrument at precisely the wrong time. Also, if you have some favorite LP from days gone by that you can't find on CD, consider getting rid of the worst clicks before transferring to DAT or recordable CD — it's not that hard to do.

THE DOCTOR'S TOOL KIT

You need:

- A hard disk recording/editing system that lets you zoom in to single cycles. (The examples shown here use Sound Tools, but any similar system will do the job.)
- The ability to "scrub" the digital audio (i.e., to go over small pieces of audio at a slow speed).
- A software function that lets you redraw the waveform.
- Lots of patience to find and remove the clicks.

STEP 1: FIND THE CLICK

The least efficient way to find clicks is to play the file and wait to hear clicks; sometimes clicks will be covered up by other program material (and you won't realize how much these hurt the sound until you remove them and everything sounds much more transparent).

The best option is to "scrub" across the file one piece at a time at a relatively slow rate (fig. 1). Compared to standard program material, clicks have extremely sharp transients; even when played back fairly slowly, clicks stand out from the track with their "popping" sound.

As you scrub, you'll detect many clicks you normally wouldn't hear when playing the audio file back at standard speed. If you take the time to remove these "inaudible" clicks, it definitely does make a difference in the overall transparency of the sound; but you can really get hung up tracking down every little pop, especially with really old pressings — use your judgment, lest you lose your mind.

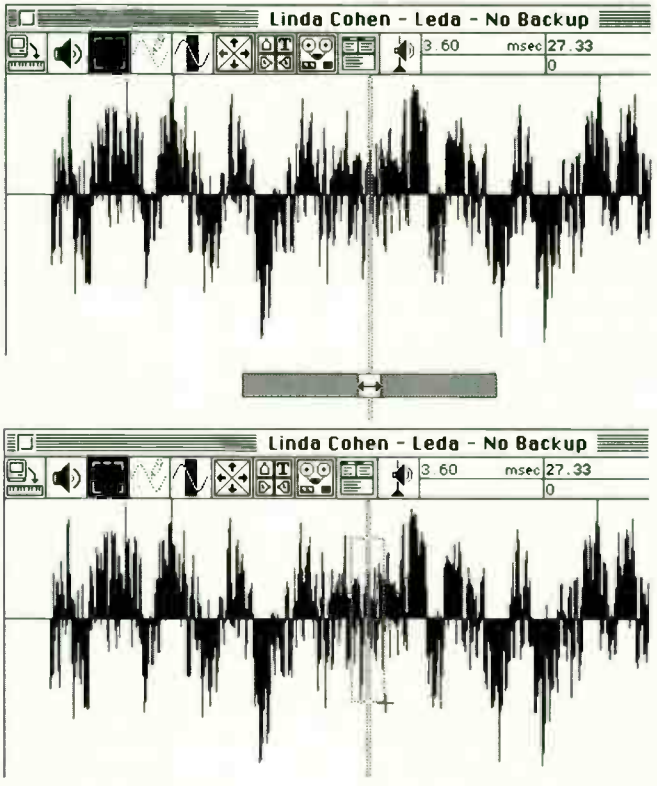

Figure 1 (top): Scrub back and forth over a range of audio to search for clicks. Here a click has been located in the general vicinity of the cursor. Figure 2: Creating a marquee around the area containing the click.

World Radio History

REVIEWERS & SATISFIED OWNERS WROTE THIS AD ABOUT OUR 8•BUS CONSOLE SYSTEM.

1994 Music & Sound Award

"...So quiet I had to doublecheck to make sure it was on." M.C., Los Angeles, CA

"One of the mixer's most impressive features is the **channel EQ section.** The amount of tonal control is **awesome.**" *Electronic Musician 2/94*

"Killer, sweet-sounding, **mega-versatile EQ!!!**" R.T., Los Angeles, CA

"Flip... allows you to choose the signal that's fed to the channel strip and conversely selects the signal that is sent to Mix B, the **powerfully featured monitor section.** Yes you can still access all the gear you plumbed in without having to repatch a thing. This... effectively doubles your inputs. It's ideal for mixing situations when you have stuff playing live from a sequencer coming in on Mix B." *H&SR (UK edition 5/94*

"The **mic input circuitry** is the remarkable **low noise** design that first brought Mackie into the spotlight." *H&SR (UK) 2/94*

"I'm happy to report that the desk maintains Mackie's reputation for **clean, quiet circuit design.** Some of my tests, involving CDs, showed up the noise on the original recording quite clearly. Even without the EQ switched in, the desk displayed a very open, transparent quality." *Sound on Sound (UK/Europe) 12/93*

32•8 shown (instead of 24•8) because we had a cooler picture of it.

Most Innovative Product of the Year
MACKIE DESIGNS 8-BUS MIXER
January 27, 1994

Winner of Music and Sound Retailer Magazine's awards for **"Most Innovative New Product"** & **"Best New Console/Mixer"** of 1994.

NEW! 24•E 24-ch. expander
NEW! 11-rack space "Sidecar"

"The board's price may put its primary market in the personal studio and small project studio, but **it's crammed with truly professional features.** Home recordists can stay with the Mackie 8•Bus as they upgrade from semi-professional to professional gear, thanks to the board's ability to run either +4 dBu or –10 dBV operating levels. **Everyone** (and I mean everyone) **who saw the 8•Bus wanted one,** and the desire was intensified if they stuck around to hear it." *Electronic Musician 2/94*

"**Amaz-ing. Beautiful. Sexy.** I've been waiting for six years for someone to come out with a mixer like this." J C, Charlotte, NC

"With **excellent sonic quality,** frequency response, harmonic distortion and crosstalk specs, number of inputs, plenty of headroom, good-quality mic preamps, and the **upcoming automation package,** the price of the Mackie 24x8 seems insignificant." *MIX magazine 2/94*

"When I read about your 'quiet' fan in your power supply manual, I almost fell over. When I didn't hear it, I fell to my knees. **When I brought up fader after fader and still heard nothing, I almost blacked out!** Who in the world EVER realizes that audio gear must be **quiet**? I love you people." D.S., Palmdale, CA

"Replaced a $20,000 console with the 24•8. **Your console kicks butt over my old one.** I love the EQ, the headroom and even the pans." D.C., Burbank, CA

"Used a competitor's console while waiting for your 8•Bus and will never use the other board again. **Yours is quieter, has better mic pre's, better EQ, more logically laid out, much cleaner sound and better quality construction.**" P.P., Salt Lake City, UT

"The back of the board has 24 submaster/tape outputs incorporating a **triple bus system** normalling your submaster to tape ins on the multitrack. When you send a signal to submaster 1 output, for example, it appears at submaster outputs 1, 9 and 17, which **simplifies operations** with 8-, 16- or 24-track recorders." *MIX magazine 2/94*

CIRCLE 38 ON FREE INFO CARD

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STEP 2: ZOOM IN ON THE SUCKER

Once you've narrowed down the general region containing the click, put a "marquee" around it to zoom in closer. The object is to narrow the search so that the click becomes visually obvious enough to edit.

The waveform should now fill the screen, and may even be blown up enough for you to recognize a distinctive click waveform. If not, rescrub and remarquee to work with smaller and smaller regions until you isolate the click.

STEP 3: SURGERY TIME

A click looks like someone has taken a slice out of the waveform (fig. 3). Severe clicks have spikes that extend above the waveform and also cut into it.

If you're using Sound Tools, enable smoothing as this will make a smoother cover-up. Now simply draw over the click to reconstruct the original sound.

STEP 4: FRUITS OF YOUR LABOR

Fig. 4 shows the postoperative wave-

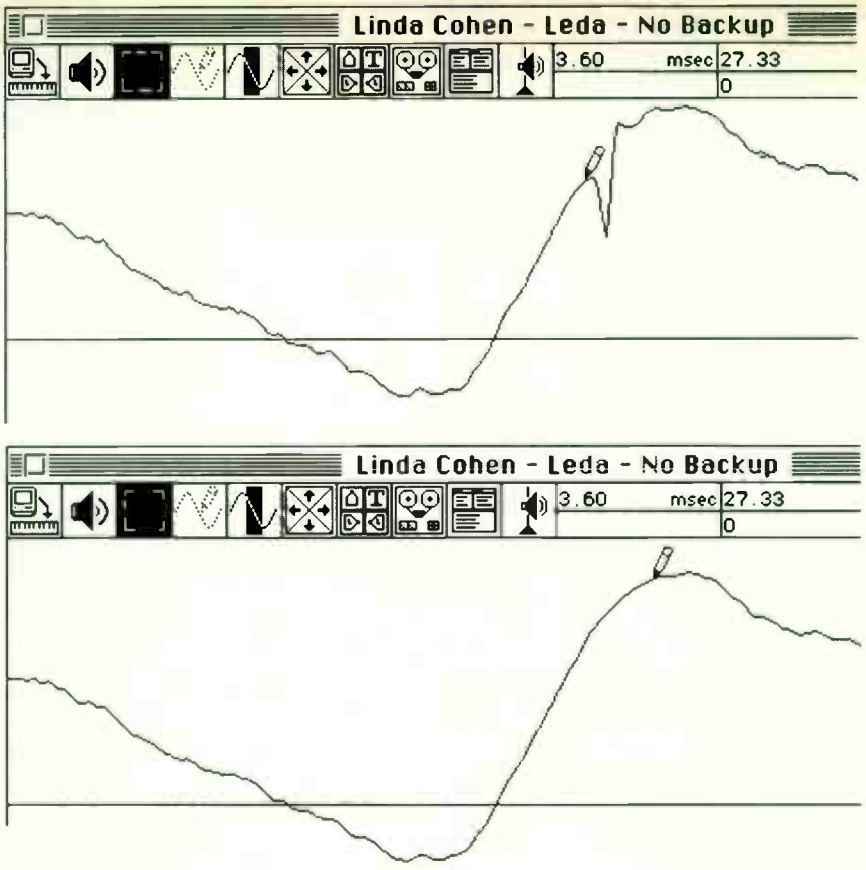

Figure 3 (top): The highlighted region shows the click. The pencil is poised, and ready to draw over the click.
Figure 4: The click is history.

COMPRESSED COMPRESSOR

Meet the little cousin to the widely acclaimed DC 24... but don't let the size fool you. The FSC 22 is very big on performance and features. Like switchable attack/ release response, dual-mode metering to display either gain reduction or output level, and an Input Trim switch to match -10dBV or +4dBu systems for minimum noise and maximum headroom. It's even got those clever new Neutrik connectors that accept three-pin or 1/4" connectors!

Back these features with the superlative VCA performance that made the DC 24 famous, and you've got yourself a top-notch compressor/limiter that's ideal for studio or home recording, live sound, broadcast or post-production. Mount two horizontally for 4 channels in a 19" 1U space. Or rack-'em up vertically for 20 channels across for patching into console inserts.

No job is too big or too small for this pint-sized wonder.

PURITY BY DESIGN

RANE

FSC 22 STEREO COMPRESSOR/LIMITER

RANE CORPORATION 10802-47th Ave. W., Mukilteo, WA 98275. (206) 355-6000

CIRCLE 44 ON FREE INFO CARD

World Radio History

The SRV-330 Dimensional Space Reverb represents the ultimate marriage—one between a studio reverb with unrivalled sound and Roland's proprietary 3-D technology. Thus, it can replicate virtually any acoustic environment. And the new algorithms and extensive editing parameters give you tremendous creative flexibility. With added features like ducking and fully-controlled gated reverb, the SRV-330 is a must. (Call or write for an audio demo CD of the SRV and SDE-330's, with 79 musical examples featuring various reverb and delay effects. Include $5.00 for shipping and handling.)

Now you can experience 3-D without these dorky glasses.

The SDE-330 Dimensional Space Delay leads a totally new generation of digital delay units. Among its many features are up to eight independent 2900-millisecond delay taps that can easily be set by musical values, tapping of a foot switch, or with MIDI clock. What's more, there's a Reverse Delay feature which plays back the delayed signal in reverse whenever the input level exceeds a pre-set trigger level, as well as Pitch Shifters for combining additional effects with sound localization. Roland's 3-D technology places the sound in a 360° spacial environment, all around you. And isn't that where music should be?

Roland®

Roland Corporation US, 7200 Dominion Circle Los Angeles, CA 90040-3696 (213) 685-5141 Roland Canada Music Ltd., 5480 Parkwood Way Richmond, B.C. V6V 2M4 (604) 270-6626

CIRCLE 51 ON FREE INFO CARD

form: the click is gone. Play back the audio and you'll be surprised to hear the obnoxious click is either nonexistent or has perhaps been transmuted into a very soft (and almost impossible to notice) dropout.

Fig. 5 shows another example of drawing out a scratch. Here, rather than being a straight line, the line is curved a bit to (hopefully) more closely simulate the original, prescratched waveform.

OTHER TIPS

• Don't get discouraged. After about 20 minutes of working on a file, you'll learn to recognize the distinctive shape of a scratch, and work will go much faster from then on.

• Always edit a copy of the file. This is very important! On occasion percussive instruments or other transients can look like scratches, and you might remove one accidentally.

• Speaking of which...generally, a click will sound the same whether you scrub forward or in reverse, whereas a percussive instrument will not (reverse scrubbing with percussion sounds gives the characteristic reverse tape "sucking" sound, even with very short signals).

• And what if you want a scratchy sound, as if you're trying to pass off a loop you created with your spiffy digital sampler as something from an obscure record from the '50s? No problem. Sample the lead-in groove or out-groove of an LP. To simulate a 45 RPM single, the loop should last 1.33 seconds. (Note: Ensoniq's TS-10 has a scratchy vinyl sample in its ROM set that sounds great.) Mix the noise in with the loop, and you're ready to go.

If you're faced with a real problem child, it might be worthwhile to rent some time on something like a CEDAR declicking system, which can not only take out clicks but also help a bit with surface-noise crinkles. But if you just need some quick and extremely effective repairs, you'd be surprised how easy it is to clean up vinyl using these techniques.

Craig Anderton is co-author (with Bob Moses and Greg Bartlett) of the ultra-cool new book, **Digital Projects for Musicians.**

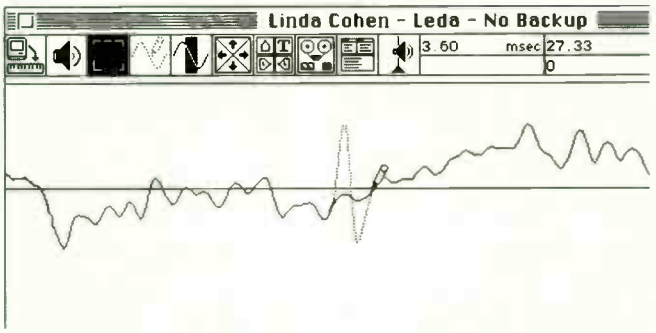

Figure 5: This scratch's "fingerprint," with sharp peaks above and below the signal (shown with the dotted line), is typical of fairly loud scratches.

PARAMETRIC PERFECTION

THE ADF-1200/2400: THE FIRST COMPREHENSIVE DIGITAL FILTER WORKSTATION

Thinking about parametrics? Get the most for your money with the ADF-1200 & 2400 Workstations. You get 12 fully programmable parametric filters per channel, with filter widths from 1/100th octave to 1 octave, and depths from -84 dB to +12 dB boost. No other parametric filter set gives you this many filters with this much control.

Need to see what your filters *really* look like? The ADF let's you work with your filters *three* ways. Choose between a tabular listing of your filter settings, a graphic representation, or a graph of the actual frequency response curve. No other parametric filter set gives you this many ways to interact with the filters.

And, of course, all these filters can also be switched to Sabine's patented adaptive filters for transparent, automatic feedback control. But filtering is just the beginning. The ADF Workstation includes *all* these fully programmable features:

- **12 or 24-Band Parametric Filtering**
- **Shelving Filters**
- **Digital Delay**
- **Automatic Feedback Elimination**
- **Noise Gate**
- **Real-Time Analysis**

If you need precision parametrics with the highest audio quality, then choose the best: the ADF-1200 and 2400 Workstation.

Call, write, or fax for detailed information:

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Gainesville, FL 32609 USA
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ADF1224-041894

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THE STUFF THAT LEGENDS ARE MADE OF.

Talent. Hard work. A little luck. *And the right equipment.* That's the stuff that legends are made of.

Legendary musician, producer engineer, arranger and songwriter Alan Parsons knows what makes a legend. So we asked Alan to test the new Audio-Technica AT4050/CM5 multi-pattern, large diaphragm studio capacitor microphone.

"To say that the CM5 is a serious microphone would be an understatement," says Parsons. "It's up there with the very best. It gives me a realistic, warm and true representation in the studio."

"My experience with the CM5 and other mikes in the 40 Series has convinced me that Audio-Technica now ranks as one of the very best manufacturers of high quality microphones. The clincher is that the CM5 offers incredible performance for much less than its competition."

Symmetrical direct-coupled electronics in the AT4050/CM5 provide excellent transient response and low distortion.

Featuring three switchable polar patterns (cardioid, omni and figure-of-eight), the CM5 combines warmth and transparency with super-high SPL capability.

Find out for yourself what Alan Parsons has found in the new AT4050/CM5. Write, call or fax for more information. Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, Ohio 44224 (216) 686-2600 Fax: (216) 686-0719.

audio-technica.

CIRCLE 11 ON FREE INFO CARD

Alan Parsons and the new AT4050/CM5

Alan Parsons will be using Audio-Technica microphones exclusively on his upcoming world tour to promote his latest Arista Records release "Try Anything Once." (CD 07822-18741-2)

World Radio History

Can't We All Get Along?

Now it can be told: Project studios and commercial facilities can coexist

BY BUDDY BRUNDO

This is a constantly changing world. Project studios won't go away; they're only growing in number and importance. And, likewise, there will remain a healthy and important role for commercial studios for many years to come. How are these two industry segments going to work together in the future? As far as I'm concerned, we just need to work out a few details.

Every commercial studio will appreciate the growing problem. We are all getting a lot of project studio tapes with incomplete information on the tape boxes and on the track sheets. And we spend a great deal of time trying to figure out what really went on during the sessions. Sometimes it is as simple as telling us which tracks are safeties and which are masters, or which are unusable scratch material. Or letting us know what preamps or microphones were used on the vocals.

Sure, project studios are growing. But so are their needs for professional studio services. Project studio people are coming in here to have ground buzzes removed, or they are looking to replace a drum machine with a real drummer, or they are after a string date, or they need to overdub new vocals. They don't live in a vacuum, and neither do we. As I've said before, we're here to help the music.

There are some things we can't help, however. We can't help a project studio operator who just doesn't know when to let go of a project. I'm hearing this more and more from record companies — that project studios can also lead to creative excess. If you don't have a time limit to doing a music project you can simply go on and on and on. It's like overcooking a sauce. Overcooking the music can take the edge off it.

Another problem that a project studio has is that it usually means just one person — alone in a room. How can one person ever compete musically with a group of musicians in a comfortable, creative environment? Isn't

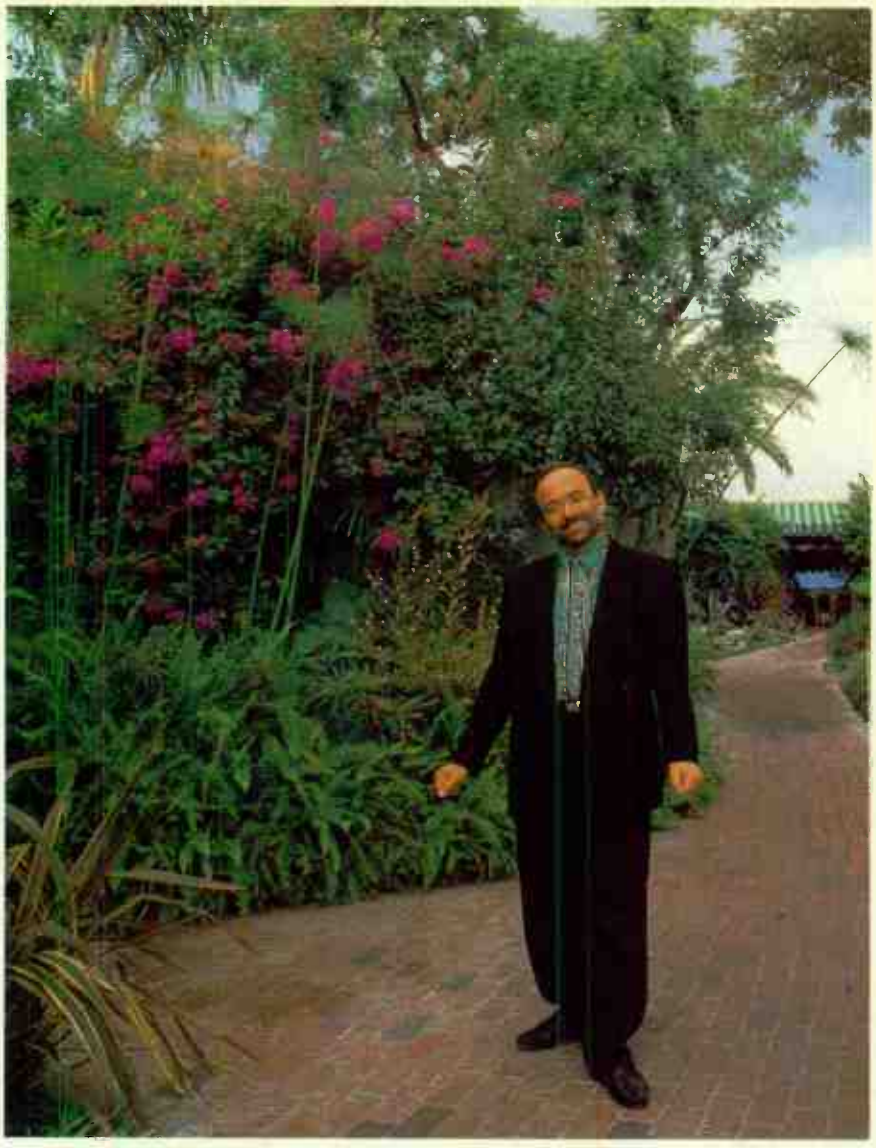
Photos by Ed Colver

World Radio History

this taking the one-man band to an extreme? It's like the film that was written, directed, produced, and starred in by the same person. The collaborative effort, the interaction between creative individuals, is what usually results in the most meaningful music, and the project studio, with all its space limitations and isolation, often can't provide this type of space. Of course, creative people should have their own creative studios: They should be able to get up in the morning and have their tape decks and consoles in their dens and be able to put on tape whatever's in their minds. But that creative space is only one part of the creative process. Music is not meant to be private. The importance of musical interaction will grow in the years ahead, especially if we continue hearing more and more acoustic music on records.

It seems that acoustic music is "in" again, but sometimes project rooms have trouble making good acoustic records. I'm hearing a lot acoustic tapes come into the studio from project rooms that are equipped with an Alesis ADAT and a pair of Yamaha NS-10's. The musicians are simply blown away by what they hear at home. But when they play the tapes in our perfectly tuned rooms, they end up wanting to replace everything. There are always exceptions (there are some fine recording spaces at home), but sometimes a project room may have a sound that is not very musical; if you get bad room reverb over a vocal it is very hard to fix regardless of where you go and what you do. Recording style and recording space have a much greater effect on the quality of a recording than the actual mics or the equipment itself.

There's another thing to consider: lifestyle. Everyone's heard the story about this local musician who was running a project studio in his house that kept getting bigger and bigger. He had a few cartage guys walk into the house one day, just as his wife was walking naked out of the bathroom. The guy didn't give up his project studio, but he did end up getting divorced. There is no privacy. Musicians work all hours of the night. People come and go. Rental equipment is in and out. There are numerous technical breakdowns that occur. It's impossible to live your life in a recording studio — and I should know.



What's more, project studio owners who get bitten by the techno bug start trying to figure out ways to finance their equipment habits and to justify the 100-input SSL and twin Sony 48-tracks. That's when they start looking for outside business — and that's when they start crossing the line between a project studio and a commercial studio.

We're well into the Nineties. Project studios are here to stay. Brilliant, cost-effective technology is upon us. Project studio operators are learning the basics of recording. And they are hungry for technical information.

Commercial studios have that type of information and we know how to communicate it so that musicians and producers clearly understand what we mean. We've had experience and plenty of it. This is probably the most important role we will be playing in the changing recording scene. We will be the mothership where projects are finished. We will continue to serve an elite clientele of producers and musicians. And for the rest of the project studio world, commercial studios will be the primary source of expertise. Better information and more open communication between all levels of recording studios will ensure that the music keeps getting better and better. That's what it's all about.

Buddy Brundo is owner of Conway Recording, a world-class commercial studio complex in Los Angeles, CA.

World Radio History

Hard Disk Recording Doesn't Have To Be Hard On Your Wallet.

"...in a price/performance comparison, the DR4d would be hard to beat. Thumbs up on this one."
George Petersen, MIX Magazine

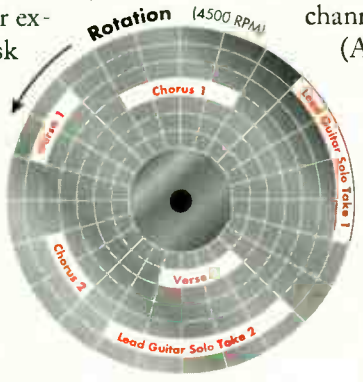
"...great sound, useful features, and friendly operation... technology that is sure to set a new standard in affordable recording"
David Frangioni, EQ Magazine

Ah, decisions, decisions. You want to buy a new multitrack recorder, and you want to go digital so that you'll get the best possible sound quality. And you'd like to buy a hard disk recorder, rather than tape, so you can get random access editing power. And finally, it's got to be something you can really afford. But there's a problem.... don't all hard disk systems require expensive add-in hardware and software, to already expensive computers? Not anymore!

The DR4d is the solution for those looking for an alternative to expensive, complex computer-based systems, or the limitations and mechanical uncertainty of tape recorders. It offers a perfect combination of hard disk recording benefits with an easy-to-use interface.

The DR4d can record up to four tracks simultaneously to standard SCSI hard disks, either internal or external drives. An optional 213MB internal disk offers 40 track minutes of recording (44.1kHz) right out of the box. To expand your recording time, simply connect external drives to the DR4d's supplied SCSI port.

With standard tape machine-style controls the DR4d is by far the easiest hard disk recorder to operate, which means that you can get to work immediately creating music rather than setting up and operating a computer system. Punch ins/outs can be performed manually or automatically from the front panel, or by footswitch, naturally.



On a spinning hard disk, the sections of music can be accessed almost instantaneously by the moving heads of the drive mechanism. This allows you to seamlessly output parts regardless of their location on the disk. Also, music can be easily rearranged in ways not possible with tape.

Now you can start to take advantage of random access editing. You can cut, copy, and paste sections of audio with ease. Our Jog/Shuttle wheel lets you scrub through the audio at various speeds, forwards or backwards. Try out different arrangements. Create perfect tracks by combining the best sections from multiple takes. And you can edit with confidence, because if you change your mind you can instantly Undo your last edit - even after the power is turned off and on again! Imagine it. Do it. It's that simple.

You can instantly move to 108 memorized locations at the touch of a button, and these locate points may be entered manually or on-the-fly. It's also simple to set up **seamlessly looping** repeat sections, so it's easy to jam over tracks. No more wasting time on rewinding tape!

Of course, how the DR4d sounds is as important as how it works. Advanced 18-bit oversampling A/D and D/A converters insure crystal clear sound, and with a full 96dB dynamic range, the DR4d offers no-compromise specs. The four balanced 1/4" input and output jacks are switchable between -10 and +4 operation, and 2-channel digital I/O is included standard (AES-EBU and SPDIF) with two additional digital ports optional.

Need more than four tracks? Four DR4d's can be linked to create a 16-track system. And for synchronization to other gear, just add the optional MIDI or SMPTE interfaces.

And best of all, the DR4d is an **affordable** reality: suggested list is only $2495.00 (or $1995.00 w/o hard disk)! Multitrack disk recording *is* within your reach, so see your Akai dealer today for a complete demo!

Now Available - Version 3.0 Release: Track Merging, Midi Machine Control, and Midi Time Code support!!

On tape, the sections of music are physically located far from each other, separated by many feet of the tape itself. Since you have to move all that tape past the heads to get where you want to go, it's impossible to jump instantly from one section to another. It wastes time, and limits creativity!

Intro Verse 1 Chorus 1 Verse 2 Lead Solo

DR4d

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CIRCLE 01 ON FREE INFO CARD

World Radio History

Taking the Direct Route

How I recorded George Benson's Grammy-nominated song direct to hard disk

BY GARY HENRY

Not many people realize that an entire song can be recorded directly to hard disk, but my work with Roland's DM-80 workstation on George Benson's remake of "Got To Be There," which got me nominated for a Grammy Award (Best Pop Instrumental Performance), shows how convenient this technology really is.

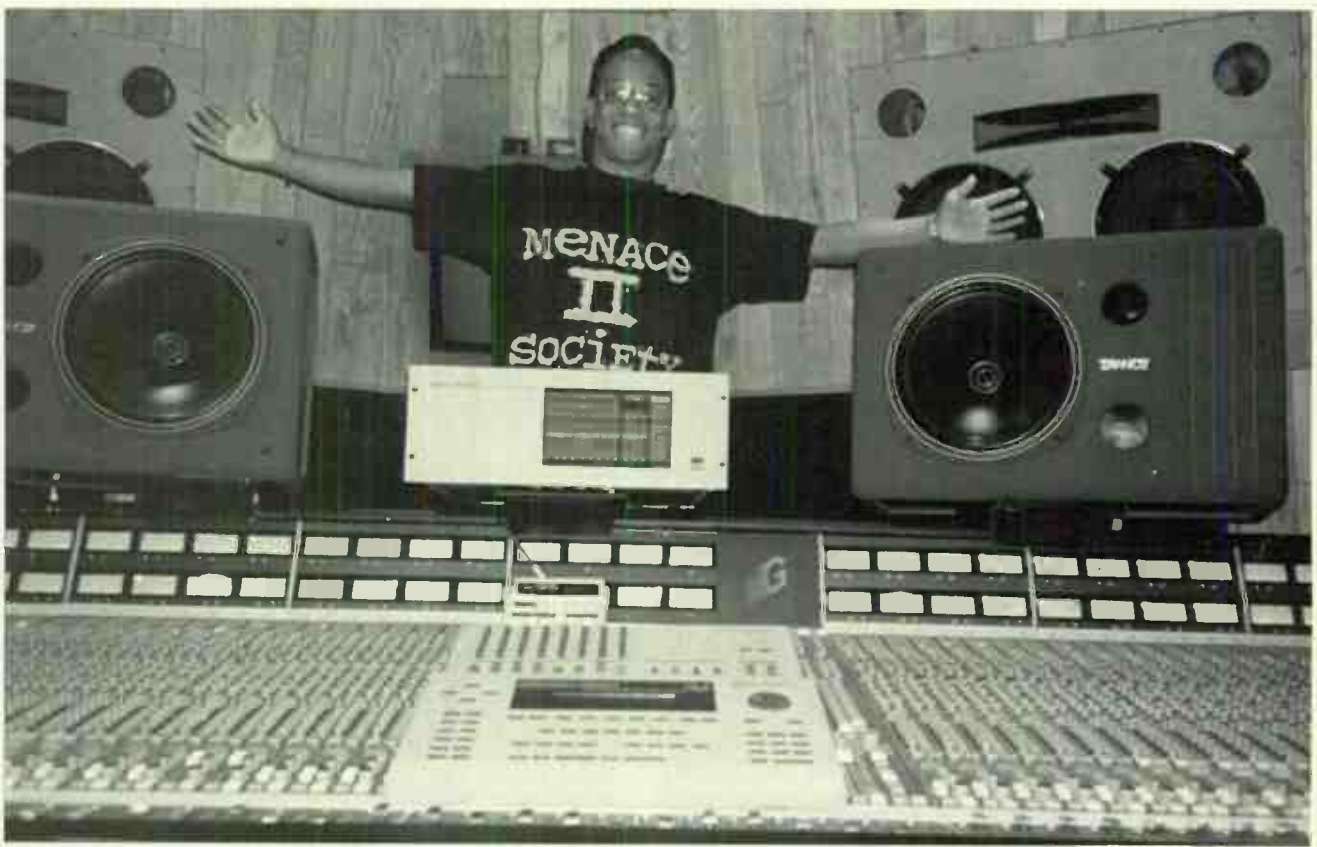
My role in the latest George Benson project was as producer, engineer, and arranger. The project was recorded at Hideout Digital and Electric Lady, where all the tracks except vocals and guitars began as virtual tracks in a sequencer. The live tracks were recorded directly into the Roland DM-80 workstation. After the tracking was finished, the sequenced tracks and DM-80 tracks were to be transferred to tape. The tracks from the DM-80 were to be directly patched to the multitrack machine, bypassing any recording console.

We rented a studio to transfer the tracks to analog tape, but after being spoiled by the great sound quality of the DM-80 tracks and the virtual sequenced tracks, the playback from 2-inch tape was a real disappointment. So we decided instead to transfer the tracks over to a 48-track digital tape machine and then mix from the resulting 48-track master. Since the DM-80 only has eight outputs, we locked it to the digital multitrack via SMPTE code and transferred tracks out of the DM-80 eight at a time.

Once the tracks had been recorded onto the 48-track digital machine, it was time to mix. The 48 tracks were sent through an SSL with Ultimation, where levels, equalization, and panning were set up. Also, outboard effects such as reverb, delay, and EQ were used to process the tracks. Some of the gear we used included the Roland RSS and 760 sampler, AMS reverbs, Pultec equalizers, Lexicon 480L and 300 reverbs, Focusrite Red series EQs, and Neve compressors. The song was mixed to 1/2-inch analog tape and DAT.

So far there is nothing really out of the ordinary.

After years of experience in dealing with record companies I have learned to be ready for anything. Sometimes the record label people will ask for a remix because they want a small change, but they don't always realize the time and expense involved



Gary Henry used his Roland DM-80 workstation and the Electric Lady's SSL console to make George Benson's Grammy-nominated song.

World Radio History

MAN AT WORK: Henry doing his thing.

in hiring a studio and engineer, and doing a Total Recall. Wanting to be prepared for any situation that might arise, I came up with a unique concept.

After the final mix was complete, I recorded each channel, one at a time, from the mix into the DM-80. This took roughly 72 takes because we transferred 48 tracks from the tape machine (via channels on the SSL). We also transferred the effect returns as separate passes into the DM-80. We actually copied the board, channel by channel into the DM-80. If a stereo effect was created from a mono (tape) track then the composite stereo sound, including the effect, was recorded onto two tracks in the DM-80.

Although this sounds like a lot of tracks, it really is not for the Roland workstation. The unit can record up to 1024 tracks provided you have the hard drive space available. Since I had 10 GB of hard drive available, this was not a problem The song took about 1.2 GB and the hard drive was backed up to APS DAT backup.

Because the transfer took place channel-by-channel, the effect devices were never processing more than one sound simultaneously. The interesting thing is that if you are sharing an effect device (like a reverb unit) among several different sounds, those sounds are bouncing around off each other inside the unit. So if there are a tambourine and snare drum both routed to the same reverb unit, when you solo the reverb return you will hear both.

This being the case, when I recorded the effect returns into the workstation I printed a separate track of the return for each instrument that was using the effect. Although this meant making more passes, it also meant that I could optimize the effect unit for a particular sound and turn off other sounds that may have been routed to the same unit. Now I could have virtually unlimited outboard gear available on any sound. If I wanted, I could have a separate AMS reverb for every sound. Even if the studio only had one of a particular type of processor, it didn't limit me — I only needed one unit to make a channel transfer, and then I could reset the same unit differently for the next transfer.

Also, I could now independently pan the effect return track (within the DM-80) to a different location from the sound that was being processed. As an example, there might be three backing vocals that normally would share a reverb. But if I recorded a separate reverb track for each vocal, I could then pan the three reverbs wherever I wanted inside the DM-80. I had a versatility previously unheard of, and the whole transfer process only took about two hours.

By the end of the day I had the stereo mixes of the song and also had all of these tracks recorded separately into the DM-80, "just in case."

Several days later the verdict came

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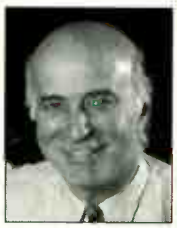
An open letter from Morris Ballen, Disc Makers Chairman



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MUSIC MEN: George Benson, Henry, and record industry executive Bert Padell.

back from the record label: the song had to be remixed because the tambourine was too loud in the second verse. Normally this would mean booking a studio and an engineer on short notice and then doing a total recall and remix. But since the DM-80 had all the tracks and effects right on the hard drive, I could do the remix anywhere! I didn't even need to rent anything because it was all inside the DM-80.

I began the process of mixing within the DM-80 so that I could ultimately have the mix appear on the eight faders from the DM-80F fader board. This unit is a control surface that allows adjustment of level, equalization, panning, and automation of tracks in the DM-80 while the audio remains in the digital domain. I would merge, bounce, and comp tracks with no danger of losing anything, since all the editing is nondestructive. I could even change a backing vocal part to a take that was recorded as part of the original DM-80 tracks before we went to tape. The tape medium is inherently limited when compared to hard disk recording. Using the Roland DM-80 allowed me to easily do things that would have been difficult, if not impossible, to do with a razor blade and tape.

The transparency and clarity of this process was outstanding, and having unlimited "virtual outboard gear" made the sounds much bigger and fatter than they would normally be. When recording on the DM-80, I get out of it exactly what I put in — without any loss of information. On other systems I have worked on, I hear a distinct difference between input and playback, but the Roland unit sounds great. It has a really warm tone, almost as if there were some tube circuitry inside of it.

This mix of "Got To Be There" was the one that was released on the CD and nominated for a Grammy Award. Although it was never formally released as a single, it was the one song from the CD that was played most frequently on the radio and I consistently receive comments from DJs on the outstanding sound quality of the song. I attribute that clarity to processing each track separately, to the Roland DM-80, and to staying in the digital domain.

Producer, engineer, arranger, musician Gary Henry started in music production at the ripe old age of 10 years, and went on to record the first rap record with Sugar Hill Gang's "Rapper's Delight." He has produced or engineered artists as diverse as Def Leppard, Bruce Springsteen, Kool Moe D, and Aretha Franklin.

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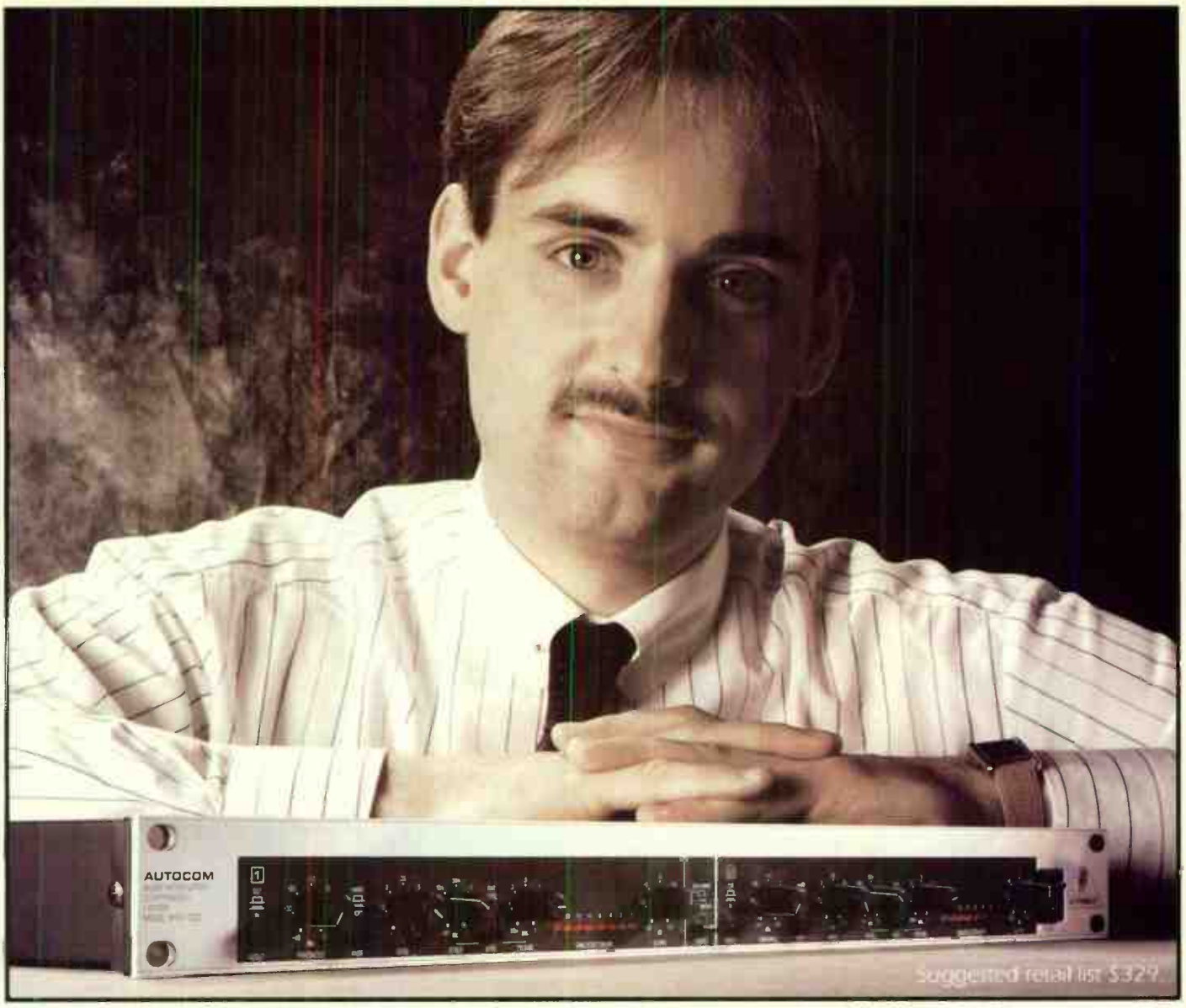

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Photo by Robert Sebree. Courtesy of SSL Black Book.

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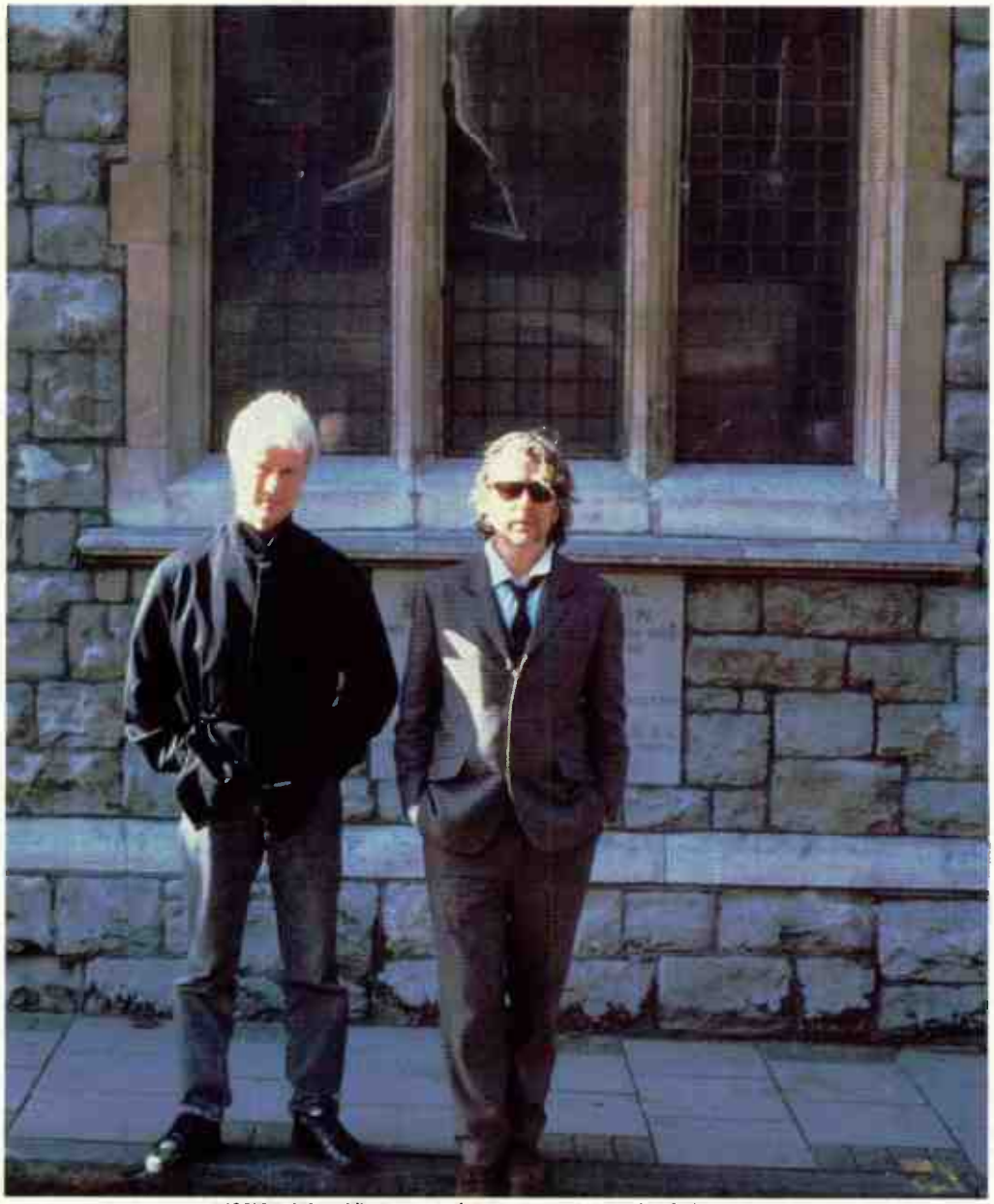
SWEET DREAMS ARE MADE OF THIS

SPIRITUAL COWBOY DAVE STEWART FINDS SOLACE IN THE CHURCH DURING PRODUCTION OF THE EURYTHMICS' LIVE DOUBLE ALBUM

BY ZENON SCHOEPE

World Radio History

SWEET DREAMS



MISSION MEN: Olle Romo and Dave Stewart outside of The Church.

As spheres of influence go, the Eurythmics were one of the most influential bands of the '80s. They played a significant part in ushering in and gaining wider acceptance for the widescale use of synths in the commercial music of that decade and served as a practical example to demonstrate that it was possible to roll your own hit records away from the accepted route of established recording emporia.

During the years that followed, the Dave Stewart/Annie Lennox partnership was also characterized by an unpredictability and by a variety of musical styles that kicked off with "Sweet Dreams" and spanned from the soul anthem of "Sisters Are Doing It For Themselves" with Aretha Franklin through the R 'n' R pastiche of "Thorn In My Side" and on to such perfect pop as "There Must Be An Angel," taking in all permutations along the way.

The partnership was also pivotal in demonstrating the power of video as a music promotion medium with a string of staggering and memorable song representations. Yet this "video band," as it was unflatteringly termed, actually kicked up a hell of a noise live — as anyone who ever saw them in concert will testify.

"We toured for an unbelievable amount of time and people saw us as a video band," says Dave Stewart. "When we got the tour itineraries out to try and work out where we were and where the tapes were for this live album, they showed eight months on tour and one month off, then an 11-month tour and four months off, and so on. We were touring like AC/DC all over the world, and it makes you wonder how we made eight albums in the meantime. If you look at the span from 1982 to 1989, we came out with nearly an album a year."

This live aspect of the Eurythmics is what the double album is all about. As Stewart explains, "It's a live history. When most people make a live album, they record gigs in a row from a certain stadium with a mobile, and the songs they play are a selection of their hits mixed with songs from their new album. They decide which are the best tracks and mix it. Then the band goes in and replaces the guitar and the drums. Then the singer goes in and sings over his vocals again and they call it 'So and so live!'

"This is a completely different concept. All gigs we did from the first to the last were recorded at some point, somehow — sometimes by a radio station, sometimes by a truck for TV broadcast. We got all the multitracks and listened to over 80 hours of live music and whittled it down to an album spanning 1983 to 1989."

THE PROJECT

The project was mixed entirely on the SSL SL 4056 G Series in Studio A of Stewart's The Church studios in London by longtime associate Olle Romo, with Stewart overseeing. This process for the double CD took about two months. "Toward the end I felt like a slave driver but I just didn't want to

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SWEET DREAMS

have a break and come back and find that I'd lost it," says Stewart.

Preparation for the album took nearly a year, as all the live multitracks that had been recorded had to be tracked down and then monitor mixed to DAT at The Church for listening purposes. However, simply finding the elusive multitracks, the first step, was not easy, given the variety of sources involved. When the recordings were unearthed, many of the tapes had to be baked, as they had experienced oxide peeling. All usable masters were then transferred to 24-track 3M 996 without noise reduction.

Many will remember the Eurythmics' performance at the Nelson Mandela concert at Wembley, but the tape of that performance has been destroyed.

"They do that routinely if nobody claims it, they just wipe it and use it for something else," observes mixer Olle Romo. "For the price of the tape they just wipe the whole thing; they could have sold it to us for much more than that!" adds Stewart. Thankfully it was not as if Stewart, Lennox, and Romo were short of choices.

"There were about four or five tracks that Annie was not too keen on because they weren't at the right tempo, or because she could tell she'd had a bit of a cold," says Stewart who made the decision to present the tracks in a concert format without breaks.

"I wanted it to build like a gig, with peaks and lows. We had some difficulty merging crowds because they were of such different sizes.

"Annie's singing was consistently good but there were different people playing in the bands — different drummers, for example — and we wanted a rhythmic consistency and a tightness, so it would all fit together.

"The quality of all the bands is amazing. Annie was singing without one overdub — and I've heard loads of singers live — and she's spot-on, all the time. With the bands you don't realize it's that good while you're playing because all you can hear is these awful monitor mixes, so in many cases, the first time we heard what we'd done was when we listened to it here at The Church. We'd turn it up really loud and on 'Never Gonna Cry Again' the sound that was coming out was incredible! It hadn't sounded anything like that on stage — there it sounded like a bass drum — really loud. I couldn't hear a

World Radio History

STEWART IN AND ABOUT STUDIOS

For someone who is regarded as one of the original engineer/producer/artists, Stewart has a balanced view of his involvement with technology.

"Contrary to popular belief, I now have only very limited knowledge of how to use equipment. I absorb what I need for doing a specific thing and then don't bother learning anything else. When we first started recording on an 8-track with a drum computer I learned how to do that, and when we got a Soundcraft 24-track I learned how to operate that and all the digital effects that were about at the time, but as soon as I learned how to make a record I wasn't interested in learning all the technology that came out in the next ten years."

So when did your knowledge stop growing? "By the time we worked on the soundtrack to *1984* I remember that I wasn't interested. I was interested in what it did and I knew what I wanted it to sound like, but I wasn't interested in getting on my hands and knees and making the thing work. I am starting to get interested again now, though."

What has brought this on? "I've got an apartment in Covent Garden with a lot of digital audio-visual equipment in it. I think it's because it's something new; it's connected with visuals and audio, and that's interesting. Sooner or later, though, it all becomes a bit like driving a car — once you know how it works, you don't need to know every single car from a Ford to a Ferrari because they all roughly do the same thing. It helps to have people like Olle around who know how to operate all these things because you get their involvement and perspective but it also means that there's not much point in my knowing everything, too."

You do a fair bit of production. What's your approach to it? "I don't really, that's all a myth, too. I do it very occasionally and only under great duress!"

But you must enjoy it. "It can be a horrible thing to do because you're watching your idea of something being changed by people you can't stop because it's their thing. When I hear something I immediately know how I would like it to be and you either have a long battle to persuade them or you give in and watch it crumble in front of your very eyes."

You're unusual as an artist in this age in still owning a commercial studio. Why bother when so many have gotten out? "It's the worst business in the world. Another misconception is that I was starting to be a business entrepreneur when everybody in their right minds knows that the studio business is the worst business in the world to be in if you want to make money.

"On the other hand I always like to cook in my own kitchen and I always found it peculiar going into somebody else's studio, with a receptionist, engineer, and all these other people that I didn't know. Bob Dylan was saying the same thing. That's why he used to hate albums, because he'd be singing these songs that were really personal and looking through the glass at a guy with no idea who the guy was. I helped him build a studio in his garage, and that's where he recorded his last two acoustic albums.

"Because I've got Anxious Records across the road with loads of bands, and have rehearsal rooms and a demo studio close by, it feels like a really creative music center.

So you believe a studio should be a creative center and meeting point? "If you're talking about a studio businesswise, that's the only way it could work. If you treat the studio as a place where, 'we have equipment and we rent it to musicians to record on,' that's a terrible idea. Olle could meet a kid in the kitchen and help him with a track that becomes a big hit, and then that kid would come back. It's all connected."

So why did you mix the live album at The Church as opposed to anywhere else? "The mixing room here is probably the best I've ever been in in the world. The truest sound. In most studios you can mix on Yamaha NS10's and it'll sound pretty true — you can do that in your bedroom. Put that up on the big speakers, though, and you won't know where the hell you are, and you can't mix on them because if you take it outside there'll be no bass on it. Here you can actually mix on the big speakers in Studio A (Neil Grant Boxer 2 System). —*Zenon Schoepe*

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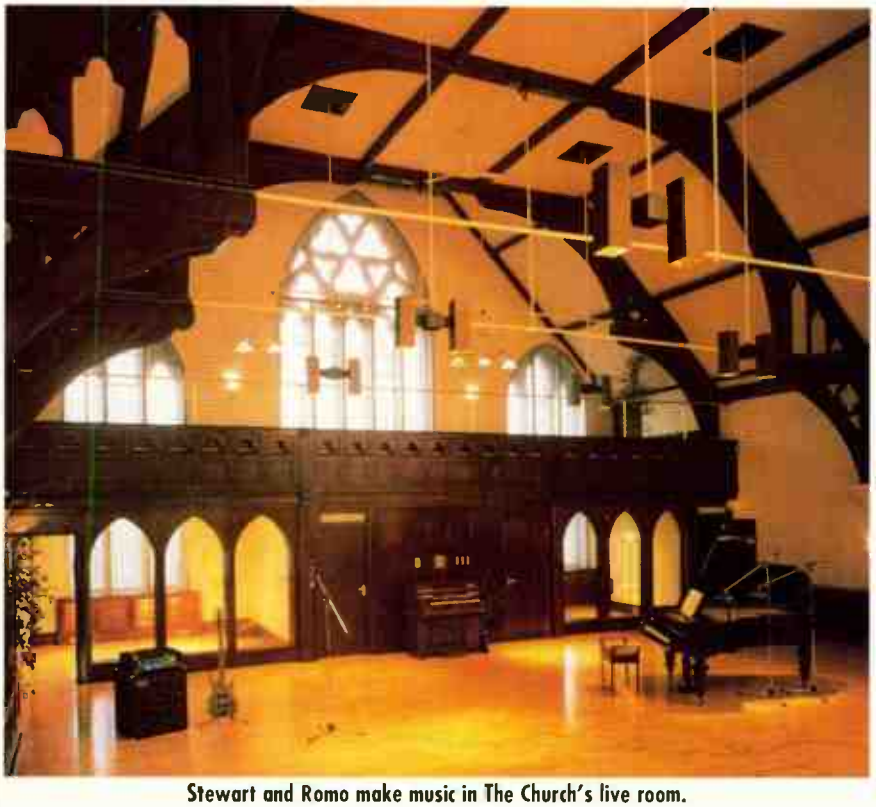
SWEET DREAMS

The Church's Studio A features an SSL SL 4056 G Series console.

word Annie was singing, just a bit of backing vocal, and that was it!"

THE MIX

Olle Romo has been working with Dave Stewart for more than seven years, having first started as drummer with the Eurythmics and having then crossed the divide to become an engineer and mixer. "When you hang around and work in studios, you absorb things as you go," says Romo, adding that the arrangement is not so much a team as it is an environment.



Stewart and Romo make music in The Church's live room.

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SWEET DREAMS

The spiritual home of the spiritual cowboy.

"It's not just a case of me and Dave. We spin off each other and that's a great environment to work in. I get to work with artists on the label (Anxious Records) and with whoever is passing by; it's all really inspiring because I get to do all these different things."

Apart from the usual assortment of thumps and bangs associated with live performance, Romo states that the mixing of the live CD never got overly complicated, but there was a lot of it.

"One of the biggest problems is that whenever Annie's not singing, the whole band spills down her mic. And there were occasions when she'd obviously run across the stage or leaned into the audience, so you even have people screaming down the mics," says Romo. Stewart remembers it all well.

"Annie and I would be all over the stage," he recalls. "Sometimes on top of the PA on either side, or I'd be in the audience trying to play along and there was all this noise coming from the guitar, caused by people touching it. I used to let the audience play it. I'd hold it out and make the shapes and they'd strum it. It sounds like the worst guitar playing in the world."

As on most live recordings, crowd noise was something that had to be controlled — particularly as people do tend to want to scream in the quiet bits, and as Stewart points out, "When somebody whistles and it gets down everybody's mic, it's a really difficult sound to get rid of."

A point of interest is that the delays used on the CD are as close as possible to what FOH engineer Gary Bradshaw used to do live.

So how did Romo approach the mix of this marathon live double CD? "I start more or less the same way I'd mix a studio track. The only difference is the

continued on page 85

World Radio History

WHY BUY A 16-CH. MIXER WHEN YOU CAN HAVE A 16/32/48-CH. EXPANDABLE AND MIDI AUTOMATABLE MIXING SYSTEM?

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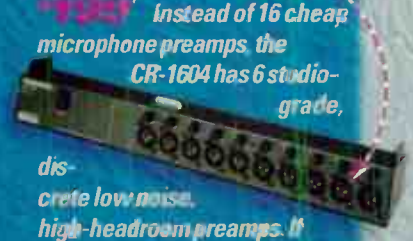

ROTATE IT-16 Not shown: The RotoPod bracket. It rotates the CR-1604's jack panel onto the same plane as the mixer's controls. Cool huh?

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UnityPlus gain structure has 20dB more gain above unity for **set-and-forget headroom** and better-than-compact-disc dynamic range.

CONNECT IT-96. Our CordPack (the bundles above the MixerMixer at left) contains 36 mono and 3 stereo low-oxygen, high fiber cables — everything you need to connect three CR-1604s & a MixerMixer. Best cable value on earth.

Solid steel main chassis.

Exclusive **multi-way physical configuration**: Just 7 rack spaces with input/output pod to back; 10 rack spaces as shown; 10 rack spaces when "Rotopodded."

4 stereo (8 mono) **effects returns** with plenty of gain (+15dB above Unity where other mixers stop).

Individual **channel signal metering** via Solo lets you initially set levels via trim controls, then forget 'em thanks to forgiving **UnityPlus gain structure**.

32 CHANNELS! Via a 2nd CR-1604 & the MixerMixer.

Two CR-1604s give you 20-32 line inputs, 12 mic inputs, 8 stereo effects returns, 16 direct outs & 2 stereo or 4 mono submasters. This is the set-up that remix wizard **Bonzai Jim Caruso** uses to produce top-charted dance mixes for Madonna, George Michael & many others†.

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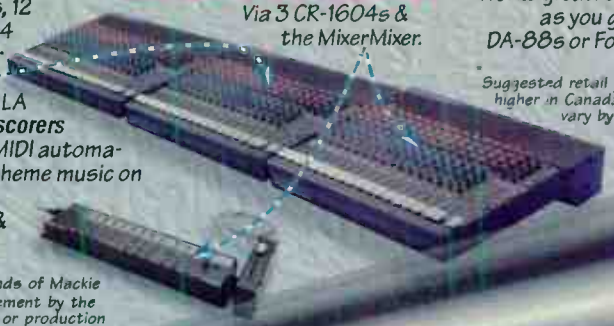
While we make a world-class 8•Bus recording console, Greg wanted us to point out just how nice a match the CR-1604 is with **8-track digital recorders**. Use Channels 1-8 to feed your 8-track via post-EQ/post-fader Channel Access jacks; run the tape outputs into Channels 9-16 (**split monitoring**). Works great. Costs less. Expands as you get more ADAT™s or DA-88s or Fostex™s or whatever.

48 CHANNELS! Via 3 CR-1604s & the MixerMixer.



Three CR-1604s give you 30-48 line inputs, 18 mic inputs, 12 stereo effects returns, 24 direct outs & 3 stereo or 6 mono submasters. A favorite configuration of LA "power-user" **film and TV scorers** (often with OTTO-1604 MIDI automation) for incidental and theme music on programs such as "The Simpsons," "Baywatch" & "Days of Our Lives."†

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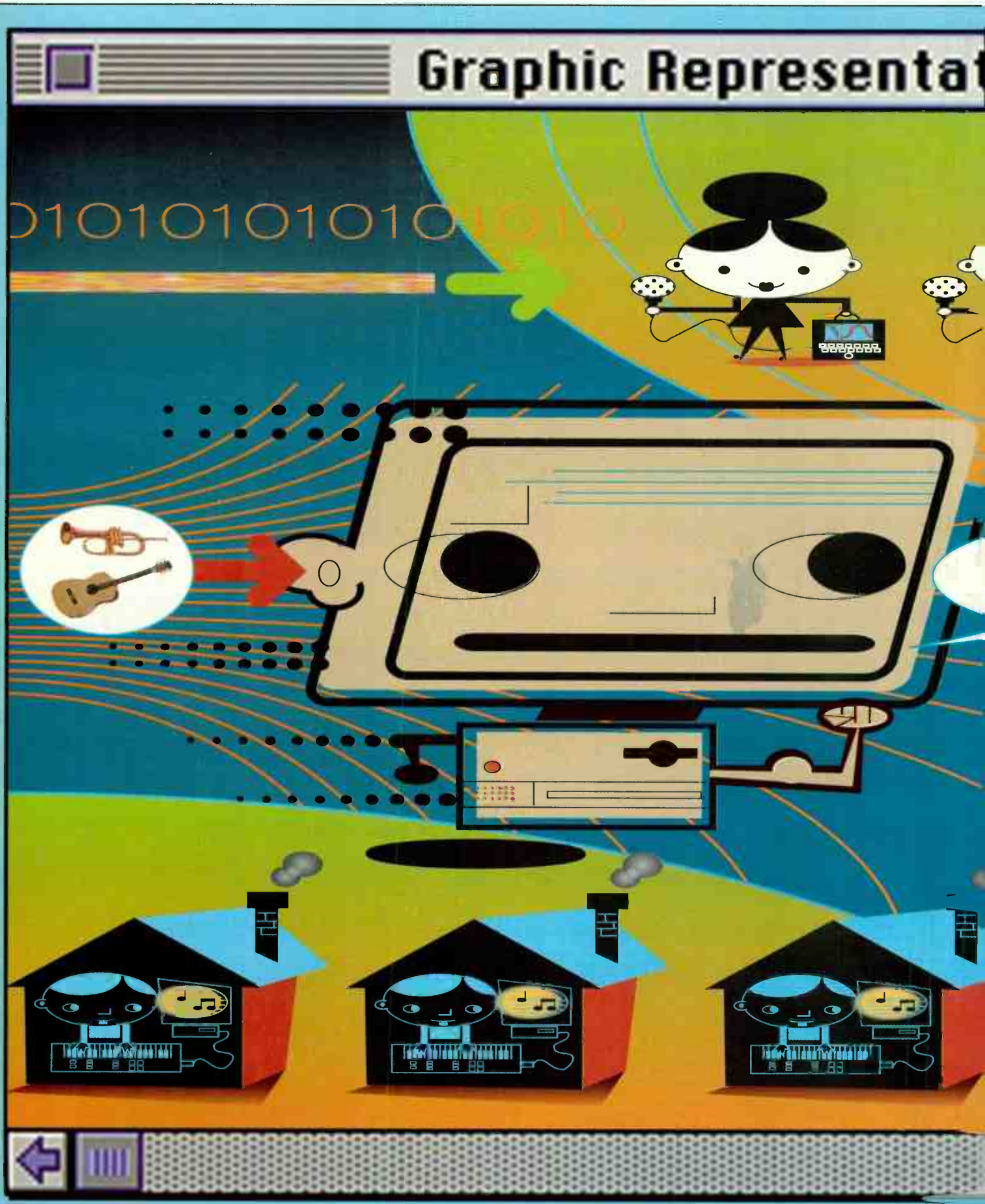

World Radio History

nd The Macintosh

The Stories

PowerMacs
AV Series
PowerBooks

EQ Digital Edition

EPS

Illustration by Claudia Newell

Irate Letter to Mix

Trash

World Radio History

The Quadra 840AV and 660AV Macintoshes.

The Stories

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The Incredible Shrinking Workstation

Mac AVs offer more power on a smaller surface

BY TED PINE

Last summer, the debut of Apple's Macintosh Quadra (née Centris) 660AV and Quadra 840AV computers nearly got lost amid all the hoopla for the company's Newton hand-held communicators. Go figure: the Newton is a runty, little pen-based computer that can't read the words you write on it; the AV's are the Macintosh 68040-class processor speed champions featuring a built-in AT&T DSP3210 chip that supports recording and playback of video and 16-bit digital audio right out of the box, with no additional hardware required.

Now consider the fact that you can buy a Quadra 660AV with AV monitor (includes powered speakers), keyboard, and 230 MB hard drive for little more than half the price of a Digidesign Pro Tools card. But just how much workstation do you get for under $3000?

First of all, you get a pair of stereo A/Ds (intended to do dual duty as mic and line-level inputs) and D/As, outfitted with everybody's favorite pro connector, the stereo miniplug. These ports are repeated on the AV monitor itself; this lets you hook up an additional input source and output destination, but you can't use both sets of inputs and outputs at once. Hip-hoppers and copyright lawyers, take note: if you buy your Mac AV with the built-in Apple CD-ROM drive, you can record to disk directly from any audio CD you happen to slip in the caddy. Apple bundles VideoFusion's FusionRecorder video capture software with the AV systems, which allows you to record and play back 8-bit or 16-bit audio (in QuickTime movie format only) at sampling rates ranging from 11.025 kHz to 48 kHz.

Yeah, but how does it sound? Apple refers to the results as near-CD quality; truth to tell, you would not mistake the av for an audiophile rig, but its performance is roughly comparable to that of a Digidesign Audiomedia II card (82 dB SNR for the AV versus 85 dB SNR for the Audiomedia card), which is to say it's an order of magnitude better than your average analog war horse.

However you acquire your audio, you'll need something to edit with. Today you've got two solutions: OSC's acclaimed Deck II software ($299), the original multichannel interface for Digidesign's Sound Tools/Pro Tools product family, or a promising newcomer, Alaska Software's DigiTrax ($349). Opcode has also announced its Studio Vision AV for release sometime this year.

Deck II, which gives you 6-track playback on a 660AV, and 8 on an 840AV, is laden with features, including a brand new multitrack visual waveform editing window, unlimited virtual tracks and virtual track mixing, continuous SMPTE resynchronization, MIDI file playback, and 24-bit moving fader automation. Even more impressive is Deck II's cross-platform playback capabilities: you can use it with an AV or a Spectral Innovations NuMedia card (a $1299 NuBus board that upgrades a conventional Mac to AV specs by adding the DSP3210 chip) as well as with Digidesign's AudioMedia I or II cards, Sound Tools II, or Pro Tools systems. So you can start a project on your AV at home and finish it up on a fully blown Pro Tools system in a facility.

The DigiTrax 6-track sports a simple, clean interface that you can pilot without ever cracking a manual. It is distinguished by such features as a built-in parametric EQ module and the ability to position audio clips or add fades in real time while the system is playing, and by a built-in controller for any internal or external CD-ROM drive for recording from CD. Given the fact that these two applications share a file format in common (AIFF), it's not an unreasonable idea to split the difference and buy them both; the price is right.

Whichever software you use, you will actually find it to be somewhat more responsive than your typical Mac or PC-based systems. The reason is that the av's incorporate an asynchronous disk I/O, i.e., a dedicated processor for hard disk I/O control that frees up the main CPU to draw the user interface. You may have noticed that things like VUs don't update and faders don't move during intensive disk read-and-write operations on other PC-based systems. There are no such problems on the av's, so paradoxically the interface of Deck II on the AV's can outperform Deck II running on a Mac with a Pro-Tools card.

That is not to say that there are not compromises, however. First of all,

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The Stories

- PowerMacs
- AV Series
- PowerBooks

there's the problem of slewing to a wobbly analog multitrack or video deck. Apple apparently has built sample-rate conversion capability into the Macintosh Sound Manager but has not implemented it, so the Mac can't automatically adjust playback speed during record in response to a funky incoming clock.

DigiTrax deals with this via a SMPTE coast feature that freewheels for as long as a second and then resyncs to the next good frame. Deck II, however, implements a continuous synchronization feature during playback that can variably speed up and slow down to accommodate fluctuations in an external video deck. But if what you're trying to do is record from an open-reel 8-track and feed in time-code simultaneously with audio, you're going to have problems if your system is not well calibrated. So you have a few choices: you can use house sync to drive your tape recorders, or use an ADAT or DA-88 as your signal source where the drift issues are moot.

As far as picture source goes, both DigiTrax and Deck II are optimized to work with digitized QuickTime movies, although Deck has a feature that will also let you use the av's built-in S-VHS port to supply a live video feed (and fortunately, S-VHS decks don't drift appreciably). QuickTime video gives you the advantage of totally nonlinear operation — video follows audio instantaneously. And the quality of QuickTime video will vastly improve this summer when Apple releases QuickTime 2.0, which will support 30 fps playback without hardware acceleration.

The new QuickTime will also support SMPTE time-stamping capability as well as provide the ability to play back MIDI files from internal Macintosh sounds — a promising development in the eyes of Alaska's founder Jeff Boone. "This means you don't need a separate sequencer to play back a MIDI file because you'll be able to load directly into a program like DigiTrax. When it comes time to mix a multimedia project, audio, video, and MIDI will all be contained in one QuickTime movie. The end user will need no special MIDI hardware to play it back."

Back to the negatives: there's no digital I/O built into the AV Macs, even though there is the intriguing Digital Audio and Video (DAV) card connector inside the box, which provides direct access to the video and audio digitizing hardware on the main circuit board. The problem is nobody makes a DAV card. There are rumors that several manufacturers are interested in releasing break-out boxes that attach to the av's high speed GeoPort connector, only there's another problem: Apple has yet to release the specs for the GeoPort.

Rumor also has it that a third party will soon announce a NuBus add-on board for release in the fall. While such a board will be welcomed, the problem with NuBus is that the 660AV only contains one add-on slot, which eliminates your option to add a video compression board, for example, or a PowerPC upgrade. (The 840AV has three slots, however.) The other problem with NuBus is that Apple is moving to the higher speed PCI bus for future systems, which means you're buying into an obsolescent technology.

Speaking of obsolescence, doesn't the advent of the new Macintosh PowerPC family make purchasing an AV a singularly bad investment? Not so, according to OSC president Josh Rosen. "The first generation of PowerPCs will actually be a step backward for most people doing DSP work. To lower the cost of the new machines, Apple has elected to eliminate the DSP3210 chip and to decrease the quality of the A/Ds and D/As.

"For now, the 840AV is the pinnacle for audio, the culmination of the 68040 generation of CPUs — and you can count on it. The fact that it is PowerPC-upgradable is great." Rosen reports that OSC's preliminary lab tests show that a current model PowerPC can support six tracks of audio with no hardware DSP acceleration.

Nevertheless, it is a safe bet that when the PowerPC matures, the incredible shrinking workstation will shrink even further.

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World Radio History

Does Power Mac = Power Recording?

More power is here, but is it a good thing?

BY CRAIG ANDERTON

PowerPC, Pentium, onboard Digital Signal Processing, faster busses, faster processors...computers are in transition. And as the stakes increase for manufacturers, they also increase for users: bet on the wrong platform and you may need to eat thousands of dollars of "obsolete" gear a few years (or even months) down the road. In particular, questions surround the Macintosh — it took the early lead in musical computing, but does it have what it takes to keep that edge in the '90s?

Apple has made a dramatic move by saying good-bye to the 680X0 family of processors and embracing a new architecture, but many in the recording business who depend on computers are still confused about the ramifications. Let's address some of the most important issues.

Is the PowerPC chip that big a deal? Yes, because of the speed advantage of RISC (Reduced Instruction Set Computer) architecture. A computer's speed relates to how many instructions it can execute in a given period of time; RISC technology requires fewer instructions to complete tasks. It's like the difference between saying "C major" or "C, E, and G all played simultaneously." The first option gets the meaning across much faster.

But isn't Intel's competing Pentium chip pretty advanced, too? Yes,

The Stories

- **PowerMacs**
- **AV Series**
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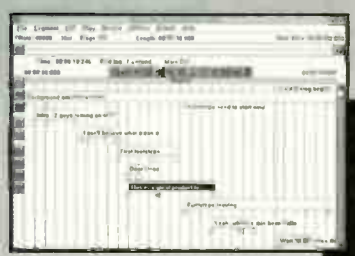

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EQ Magazine, October 1993

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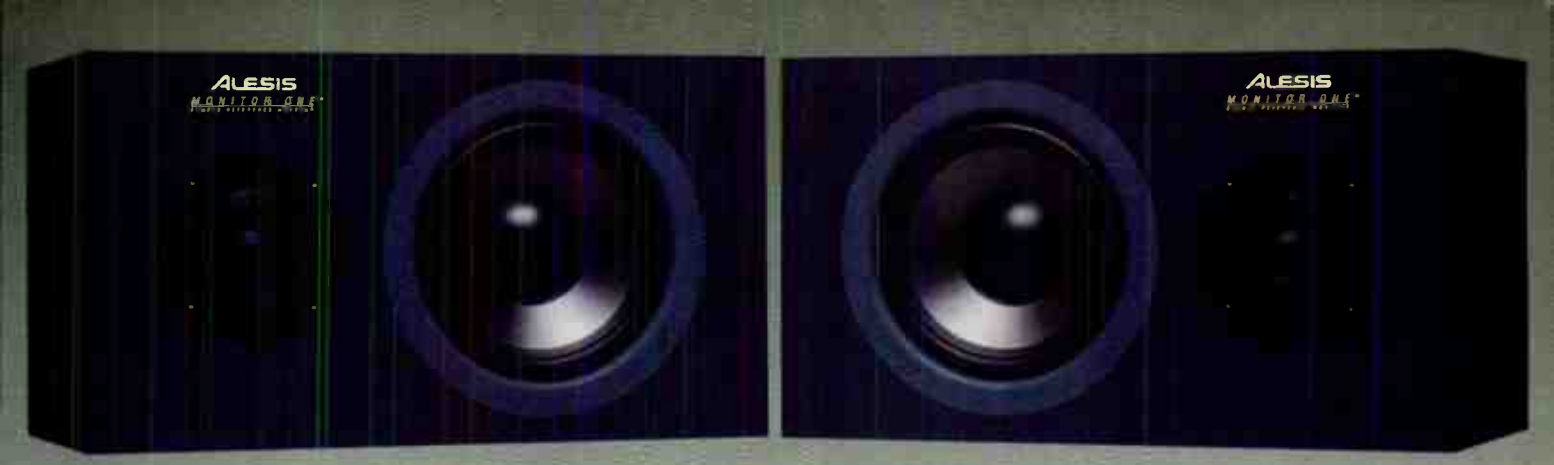

The Truth From Left To Right

The truth...you can't expect to find it everywhere you look, or *listen*. But when mixing music, hearing the truth from your monitors will make the difference between success and failure. You'll get the truth from the **Alesis Monitor One™ Studio Reference Monitor.**

Room For Improvement

Fact: most real-world mixing rooms have severe acoustical defects, with parallel walls, floors and ceilings that reflect sound in every direction. These reflections can mislead you, making it impossible to create a mix that translates to other playback systems. But in the near field, reverberant sound waves have little impact, as shown in the illustration. The Monitor One takes advantage of this fact and is built from the ground up specifically for near field reference monitoring.

The pink area in the illustration shows where direct sound energy overpowers reflected waves in a typical mixing room. The Monitor One helps eliminate such complex acoustic problems by focusing direct sound energy toward the mixing position.

The Truth From Top To Bottom

The Monitor One's proprietary soft-dome pure silk tweeter design delivers natural, incredibly accurate frequency response while avoiding high frequency stridency and listener fatigue–typical of metal-dome tweeter designs. The Monitor One overcomes wimpy, inaccurate bass response–the sad truth about most small speakers–with our exclusive SuperPort™ speaker venting technology. The design formula of the SuperPort eliminates the choking effect of small diameter ports, typical in other speakers, enabling the Monitor One to deliver incomparable low frequency transient response in spite of its size.

Alesis SuperPort™ technology gives you the one thing that other small monitors can't: incredibly accurate bass transient response. No, the SuperPort doesn't have a blue light, but it makes the picture look cool.

The result? A fully integrated speaker *system* that has no competition in its class. You'll get mixes that sound punchier and translate better no matter what speakers are used for playback. The Monitor One's top-to-bottom design philosophy is a true breakthrough for the serious recording engineer.

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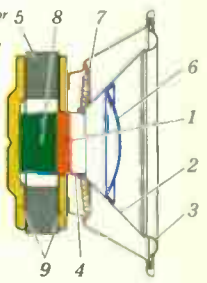

A cross section of the Monitor One's proprietary Alesis-designed 6.5" low frequency driver.

1. *1.5" voice coil.*
2. *Mineral-filled polypropylene cone.*
3. *Damped linear rubber surround.*
4. *Kapton former.*
5. *Ceramic magnet.*
6. *Dust cap.*
7. *Spider.*
8. *Pole piece.*
9. *Front and back plates.*

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but it's also more costly than the PowerPC chip, and uses older chip-manufacturing technology. Current Pentium chips are huge, making them difficult to manufacture; improved versions are scheduled to appear in quantity this summer, but the PowerPC is here now. In any event, it's likely to remain less expensive than the Pentium.

What good is a fast chip like the PowerPC if all the code has to be rewritten from the ground up? It will probably take forever for applications to appear in the PowerPC's native language. Fortunately, every leading music software company is working on native language versions of software, and these should start appearing over the summer. Emagic has already announced a Power Mac-compatible version of Logic 2.0 and Steinberg has announced the imminent availability of Time Bandit, to be followed by Cubase Score and Cubase Audio. Until these are available, the Power Mac includes Mac emulation that lets it run virtually all current Mac 68040-compatible software.

The Stories

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Power Mac Basics

There are currently three Power Mac models: the 6100, 7100, and 8100. Systems based around these machines go for $2000, $3000, and $4000, respectively. They look suspiciously like the Quadra 610, 650, and 800, but boast several improvements in addition to the PowerPC chip.

All Power Macs can do 16-bit, 44.1 kHz stereo recording/playback out of the box, with input noise specs quoted as –82 dB and output noise as –85 dB. However, those specs are optimistic. Apple uses Crystal Semiconductor's least expensive converters, and the combined noise figure for going through the A/D then coming out the D/A looks more like –78 dB (A-weighted). While this is not DAT or CD quality, it's reasonably good. Adding an AV card turns the Power Mac into a multimedia machine that can, among other talents, digitize video into QuickTime movies.

The Power Macs come with 8 MB of RAM, but this is expandable with 72-pin SIMMs. I/O includes two GeoPort serial ports, AV-type display out with video/ADB bus/sound connections, ethernet, SCSI, sound in and out, and — on the 7100 and 8100 — a second standard Mac video port.

—Craig Anderton

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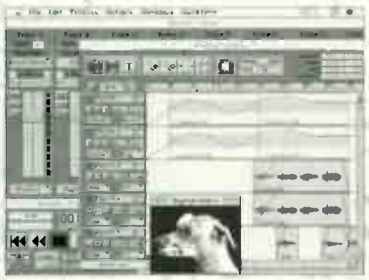

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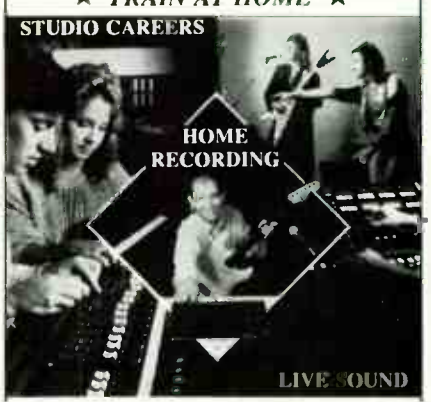

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The Stories

PowerMacs

AV Series PowerBooks

SOUND & VISION

The highly anticipated release of Apple's QuickTime 2.0 multimedia extension will do more than provide increased video performance — it'll add punch to your audio as well. Apple has joined with Roland in the creation of the QuickTime Music Architecture, which has features that will make it easier to create, edit, play, and synchronize music with video.

The QuickTime Music Architecture will include the Roland Sound Canvas musical instrument collection. The Sound Canvas has ten families of instruments (piano, organ, guitar, bass, strings and orchestra, ensemble, brass, reed, percussion, sound effects, and more), and can be used without knowing MIDI technology.

An added advantage of using the QuickTime Music Architecture is that it takes up very little disk space. As an example, Apple states that Beethoven's "Moonlight Sonata" would require approximately 180 MB if recorded as CD-quality audio, but when stored as a QuickTime movie it only uses 75k of disk space.

The Music Architecture may be different than MIDI, but it is compatible with it. Standard MIDI files can be converted directly into a QuickTime music movie and MIDI devices can record directly into music movies. The Architecture is scalable, so it will be able to use the best available device for playback. Additional hardware is not required, nor is the knowledge of configuring instruments or channels.

On the video side, QuickTime 2.0 will let video be played in larger windows at faster frame rates. It also has an infrastructure for developments and delivery of interactive television applications, including MPEG support.

The new version of QuickTime will make it easier than ever to create music for CD-ROMs and multimedia presentations. It is expected to be released in mid-1994 and, as with all QuickTime versions, will permit cross-platform compatibility between platforms (including Windows) that support it.

But emulators really slow things down. Who wants to put up with a machine that's as slow as molasses? In this case, Apple really did its homework — the consensus is that the Mac emulation software is brilliant. Even though there's a speed penalty, the PowerPC chip is running so much faster that the net result is usually a wash. Under emulation, most programs run as fast as the fastest 68030 machines, and sometimes as fast as 68040 machines (Pro Tools runs at a speed comparable to that of a Quadra 950). Several developers have reported that their programs work perfectly under Mac emulation. For example, Mark of the Unicorn's Performer, Mosaic, and interface console software all run under emulation if you use 1 MHz instead of "fast" mode; Performer seems to run faster than on a Quadra 650, even with color.

Also, it's possible to interleave between native and emulated mode (unfortunately, even some parts of Apple's system code do that; see sidebar, "The Power Mac's MIDI Achilles Heel"). There's a speed hit when you switch over, but this interleaving capability will make it much easier to bring products to market that take advantage of PowerPC capabilities. For example, the Digital Audio Engine (DAE) from Digidesign that's at the heart of programs such as StudioVision, Digital Performer, Deck, Cubase Audio, and Logic Audio could run under native mode while the rest of the program runs under emulation.

Some of the reported problems with emulation have to do with SCSI Manager 4.3 (this can also cause problems with the AV series Macs). It's crucial to update the drivers on your hard drives.

Since Apple is eliminating the NuBus in favor of the IBM-style PCI bus, doesn't that mean you can kiss your expensive peripheral boards goodbye? The initial Power Macs have NuBus slots, so they retain compatibility with digital audio hardware cards; a program like Pro Tools would need only a software upgrade for Power Mac operation. Because NuBus is so entrenched, though, it will probably live on for a while, even when PCI-based machines show up in a year or so. PCI-to-NuBus adapters are theoretically possible as well, although there's no guarantee these would appear.

Is the Power Mac too little, too late? There's a huge installed base of PCs. Isn't the momentum with IBM? That's subject to debate. A few years ago, a lot of companies were looking to the PC as a high-volume version of the Mac that would open up large, profitable markets. In many ways, it has. But the dust has cleared, and pros still tend to gravitate toward the Mac because of its more "workstationlike" qualities, while the PC has its greatest popularity with the "sound card/MIDI/sequencer" market. Apple's price cuts have also helped achieve parity, because there is no longer a large price penalty for buying a Mac.

Although sequencer companies are happy to port over to the PC (it's estimated that more sequencers have been sold for the PC than the Mac), advanced digital audio on the PC currently does not compare to that on the Mac — especially the AV series, which has built-in DSP and can do good-quality digital audio tasks with no extra hardware. Nor is there an integrated "suite" of programs for the PC, like the StudioVision/Galaxy/Studio 5 system for the Mac, all running under OMS. Still, you can add a $400 SoundBlaster board to your IBM and get a 32-voice Ensoniq chip, up to 28 MB of RAM, and 2-track hard-disk recording. It's hard to write off that level of cost-effectiveness.

Furthermore, digital audio on the PC could heat up. Several PC manufacturers are getting together with Microsoft to figure out how to integrate DSP with the PC platform. If a company like Compaq were to produce an inexpensive fast clone with high-quality onboard DSP, the picture could very easily tilt in favor of the PC as an all-in-one-box digital audio solution.

If Apple and IBM use the same PowerPC chip and PCI slots, is there any real difference between them? Buying a computer used to mean choosing between competing chip companies (Intel and Motorola) and operating systems (Mac vs. DOS/Windows). Now the only real issue will be the operating system, and most peo-

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ple agree that the Mac is better than Windows — any programmer will tell you that the Mac OS is far more streamlined. Apple has parlayed its early start with a graphical interface into a leadership position, but that could be threatened by Windows 4.0 (code-named "Chicago"), the first Windows that junks DOS entirely and goes to 32-bit operation. It's rumored to be extremely Mac-like, and could represent a serious threat to the Mac's interface superiority. System 7.5 (due later this year) and System 8.0, however, include some features that look pretty amazing, especially in terms of offering "intelligent assistance." If Windows 4.0 does take a lead over the Mac, it may be only a temporary one.

I'm doubtful about the quality of built-in digital audio, particularly the A/D and D/A converters. Are the digital audio capabilities in the AV Macs any good? Although the specs are not as good as those for something like a dedicated Digidesign card, in practical terms the sound is acceptable. The biggest problem is high-frequency response, which is down about 3 dB at 13 kHz and –5.5 dB at 20 kHz. Another problem with the AV Macs is a lack of digital I/O. The

continued on page 102

The Stories

- PowerMacs
- AV Series
- PowerBooks

ON THE BLEEDING EDGE

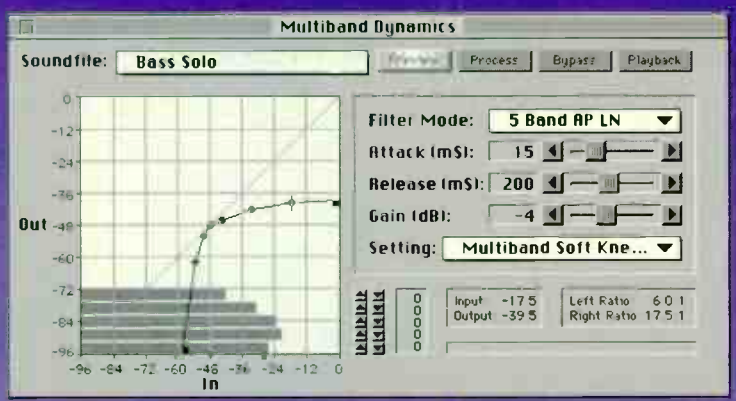
The next generation of pro audio software is upon us. Look for the following new developments:

• **Accurate pitch extraction from digital audio.** Emagic has already demonstrated taking a single-note audio track and converting it into MIDI data and notation, as well as using it for "groove quantize" features. Meanwhile, Opcode is extracting not just pitch, but velocity and bend information as well. This won't show up in Studio Vision 2.0, but it won't be far behind.

• **ADAT compatibility in Pro Tools and Session 8 (both IBM and Mac versions).** ADAT tracks show up in the eight FX returns in Session 8, as well as audio sources in Pro Tools. This not only allows for bouncing files between systems and easy archiving, but also provides all-digital mixing for your ADAT within a software-controlled environment.

• **More ADAT and DA-88 control in sequencers.** As just one example, Logic 2.0 includes a "soft BRC" to provide complete ADAT control.

• **Expansion of "music market" products into other fields.** In the beginning, there were sequencers and they were for musicians. Then Sound Designer came along and people started doing soundtracks and digital audio editing. Now multimedia content developers are using audio programs to create CD-ROM soundtracks, multimedia presentations, and so on. This means computer manufacturers will be forced to address the issue of sound quality. —*Craig Anderton*



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Apple Rewrites the PowerBooks

The new PowerBooks arrive with many improvements

BY J.D. SHARP

The Stories

PowerMacs

AV Series

PowerBooks

By the time you read these words, May 16 will have come and gone. It was an important day for Macintosh computer users, because it was the rollout day for an entire new line of PowerBook portables. The new laptops and subnotebook models offer a host of improvements that promise to make computing on the road a faster and more satisfying experience than ever — especially since the compatibility probelms have been resolved. There are also some hardware hooks that point to intriguing future developments if creators of music and audio software take advantage of them.

There are four new PowerBooks: the 520, 520c, 540, and 540c models. The Duo line has also taken a giant stride forward with the introduction of the PowerBook Duo 280 and 280c. Aside from sleek good looks, there are a few obvious upgrades. Foremost is the dual-clocked 68LC040 processor chip, which offers snappy 040 performance, like the Quadra range, in a low-power configuration ideal for portables. Processor speed is 50/25 MHz for PowerBook 520 models, with a blazing 66/33 MHz clock rate in the 540 and Duo renditions. The chip lacks math coprocessing, but this capability is rarely accessed in MIDI and audio programs. Sixteen-bit stereo audio capability with sampling rates up to 44.1 kHz are common to all new models. The 520 and 540 versions feature stereo speakers, and stereo inputs and outputs as well.

NEW & IMPROVED

The minitrackball, still used in the new Duo, has been replaced in other PowerBooks by a high-resolution glass touch pad, dubbed the Apple trackpad, that responds to the speed and direction of the user's finger movements to position the cursor. Coupling capacitance is used to detect position and movement. Both accuracy and reliability are reportedly increased; 250 points per inch are detected in both horizontal and vertical planes, and there are no moving parts or points to accumulate dirt.

Another improvement in the 500-series PowerBooks are dual-battery bays. Each bay accommodates a next-generation nickel-hydride (NiMH) battery pack, complete with an onboard processor card that communicates with the new Ever-Watch power management circuitry inside the PowerBook. The Control Strip's Battery module offers immediate feedback on potential battery life when you change the PowerBook's demands. (For instance, potential battery life goes up when you spin down the hard drive.) You can run the PowerBooks on one battery while recharging the other, a big plus. Recharging should take two hours for both batteries while the PowerBook is "sleeping," and four hours while it's in use.

Batteries are charged in succession while the computer is in use, so one is fully charged after two hours. The two batteries combine to provide four hours of adapter-free operation. Putting a processor card in the battery itself gives Apple the freedom to adopt new battery technologies as they come along without having to junk the PowerBooks.

The 520 and 540 models feature a 90-pin PDS (processor direct) slot in the left expansion bay. The slot is electronically compatible with existing PDS products for other Mac models. Since the available space for boards is about 4 inches by 3 inches, though all products will have to be redesigned. One that have been mentioned as possible candidates to plug this hole in the PowerBooks include video and monitor boards, RAM expansion, and processor accelerators. Apple has its own product intended for the PDS slot: a minicage for PCMCIA cards. This holds two Type II PCMCIA cards or one Type III (these are extra width, and can hold miniature removable storage media or peripherals too complex to fit on the flatter Type II cards).

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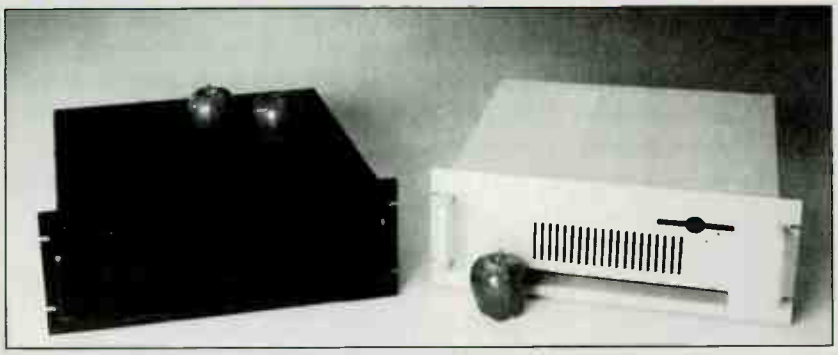

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LET YOUR FINGERS DO THE MOUSING: Apple Macintosh PowerBook 540c.

Other than ministorage devices, this PCMCIA capability is of no immediate use to musical types, but it is conceivable that some tasty peripherals may evolve down the road, especially because Type II cards will be equally compatible with Intel-based portables that provide PCMCIA slots.

When it comes to expansion the Duo is the clear winner for our applications, since the new Apple Duo Dock II offers support for monitors of up to 21 inches while leaving a NuBus card free for digital audio cards such as those provided by Digidesign. The Duo's 4 MB of standard memory can be expanded up to 40 MB. The 520's are delivered with 4 MB of RAM, with 12 MB standard in the 540's. Both computers top out at 36 MB Hard disk sizes include 160 MB in 520 models; 240 MB in the Duo 280 and 540 versions; and 320 MB in the Duo 280c and 540c renditions.

MORE POWER

Another welcome change in the PowerBooks is an upgrade path; the 040 processor is mounted on a daughterboard that is ready to be popped out and replaced with a PowerPC processor when the low-power consumption 603 chip becomes available (it's projected for this fall). Although most music and audio processing programs are not native for the PowerPC at this time, the writing is on the wall. It is reasonable to expect all popular products to be ported to the PowerPC as musicians, composers, and studio owners upgrade their Macintoshes. The timetable for this forward leap is somewhat uncertain, but "end of 1994" is a decent approximation.

The "c" models are color, and the PowerBook 520c, the less expensive of the two, employs a new display technology that overcomes some of the shortcomings of passive matrix displays without the added expense of an active matrix. The dual-scan display divides the screen into an upper and lower part. The improved screen refresh offers a 25 percent improvement over previous passive designs (but is still considerably slower than the premium-priced active matrix design used in the 540c).

Display complexity follows the models right up the price scale. The 520's four-bit display provides 16 levels of gray, while the 8-bit 520c delivers 256 color variations. The 540 features 64 gray levels, while the 16-bit color displays in the Duo 280c and 540c deliver

continued on page 102

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EQ LIVE

NEW GEAR — PAGE 74

LIVE SOUND FOR THE GIGGING MUSICIAN

VIDEO BAND IN A VAN

■OF THE BANDS currently performing around the country, or even around the world, most have one thing in common: they perform on musical instruments. But for one band, the concept of live performance takes on quite a different twist. 77Hz/Rev 2 might just be the world's first "video band." Although their performances do feature musical instruments, the ensemble uses video in a manner almost totally unique. The 77Hz presentation is something most people have never experienced — or for that matter even conceived of.

77Hz consists of four members, each of whom has a specific function in relation to the overall concept. Benton Bainbridge has the role of "live image processor" and explains what makes a 77Hz performance such a different experience:

"Our performances use a combination of preedited video from tape and visual images that are captured live at the venue. For example, before we start a performance of 'JOY and other impulses,' we will shoot video of various hand gestures, some from the audience and some from members of the ensemble. Then these images will be manipulated during the course of the performance."

At a recent 77Hz show (top to bottom): Michael Shell, Nick Didkovsky, and Benton Bainbridge

It is the manipulation of the images that makes the performance unique. Bainbridge explains that the video is processed through various devices such as the Panasonic WJ-AVE5 and the LIVE! board (distributed by Argus Associates, CA). The WJ-AVE5 is basically a video switcher that also has the ability to frame-lock two video cameras, thus allowing the switching and merging of the images from each camera to be in sync with video from tape. The LIVE! board, when used in conjunction

THE 77HZ/REV 2 ELECTRONICS ENSEMBLE BRINGS THE HOUSE DOWN WITH MORE THAN JUST AUDIO

BY STEVE LA CERRA

World Radio History

Nancy Meli Walker manipulates live video of herself.

with the Amiga 2000 computer, can digitize video and allow effects processing of video images in real time. That last bit might not seem to be a big deal for audio people because we are accustomed to digitally manipulating audio instantaneously. But the processing of video in real time is something that was not available at an affordable price even ten years ago.

Using these and other devices, Bainbridge can change colors, mix different images together, create video feedback, and move video backwards at the push of a button. This speed of processing allows Bainbridge to "play" his video gear much as a piano player would perform a piece of music.

SETTING THE STAGE

All this manipulation is made visible to the audience by situating the band members with their backs to the audience. The arrangement provides the audience members an opportunity to view Bainbridge, plus guitarist Nick Didkovsky, video animator/switcher Nancy Meli Walker, and audio/video artist Michael Schell (who uses samplers, video shot on location, and small toys) while they are at work at their "stations."

By allowing people to see what the ensemble members are doing, this process of "spontaneous animation" becomes demystified and the observer connects to the performers more than if he or she was just viewing the result on a screen. Bainbridge relates this experience to that of watching a guitar player create feedback: "If a guitar player is seen facing the amp to create feedback, then the audience has a concept of how that particular sound is made. By making our equipment visible, the audience can relate our motions to what is occurring on the program monitors."

Although guitarist Nick Didkovsky is not directly playing any video gear, he is capable of changing the visual program display as well as of creating music by playing his guitar. The guitar is routed to a Fairlight CVI (Computer Video

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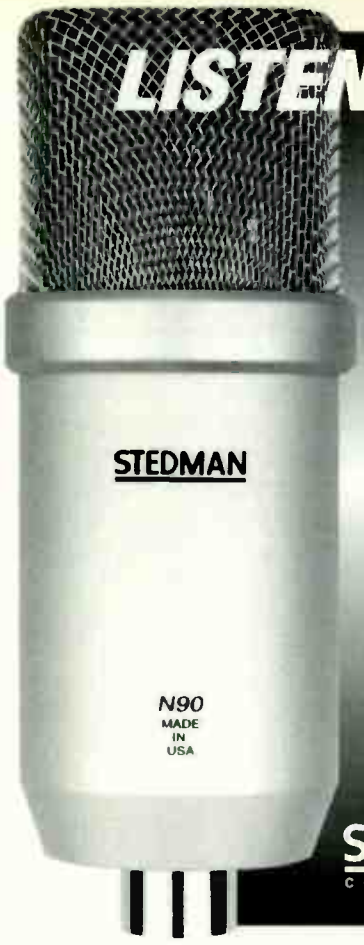

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Instrument) through which it can trigger playback of video. The CVI is constantly being fed video (from tape or live camera) that passes through a digital frame buffer so long as Nick continues to play his guitar. When he stops playing, the CVI holds the video image in the frame buffer, thus giving the guitarist the ability to start and stop the progression of the video. Since the tape continues to feed the Fairlight even when Didkovsky freezes the image, he can make the image "jump" to a new scene when he resumes playing.

The Fairlight CVI is also used by animator/switcher Nancy Meli Walker for image processing techniques such as colorizing, strobing, quad mirroring and turning positive images to negative. The CVI, in conjunction with the New Tek Video Toaster (running on the Amiga computer), allows Nancy to switch video program displays between images coming from live camera, videotape and animation. According to Benton, "Nancy has brought to the group a new interest in 3D stereoscopic video," a format she accomplishes through the technique of layering images together while moving them at varying rates and positions. This technique is featured in "Sequel To An Unfinished Story" and will be incorporated into future works from 77Hz.

Audience members view the results on 19- to 27-inch color video monitors positioned at various points around the venue. For this reason, 77Hz targets venues that can provide the monitors in addition to a sound system for the guitar and sampled sounds.

Benton says the philos-

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Some samples of 77Hz video: (upper left) Bainbridge uses a security camera to capture a flame; (others) a hand is both shot and processed live.

ophy of 77Hz "allows for both high-tech and low-tech tools to be used in accomplishing our mission." Additional audio effects are provided by Michael Schell, who uses anything from an Ensoniq EPS 16 PLUS sampler and MIDI effects devices to contact mics placed on toy clocks or vibrators. The audio is premixed on stage by the ensemble through an Alesis 1622 mixer. A master feed is then sent to the house system, where it is amplified. Among the unusual video accessories is the "Hydro-Matte" — basically a black wok with water in it. A camera is used to shoot light reflecting from the water and these images are captured by the camera and combined into the video system.

DOG DAYS

77Hz was founded in 1991 by Bainbridge and Philip R. Bonner. Benton explains how the two of them were working at The Experimental Television Center (New York) on a project for which a new type of video switcher was being used. "This particular switcher could be triggered via audio signals. Several cameras were set up around the studio and a dog was brought in and placed in the center of the room. A microphone was used to pick up the sounds that the dog was making and then route them to the switcher as a trigger signal. Bonner dressed in a costume in an effort to make the dog become upset and start barking and growling While the cameras were shooting the scene, the growls and barks triggered the switcher to change from one camera to the next (or to a VTR playing tape) depending upon how often and how much the animal made noise." The concept intrigued Benton and his colleagues, and thus the ensemble was born.

And where did they get that name? Scientists have experimented with using a 77 Hz audio signal for methods of crowd control. Although it didn't work out for them, it certainly is working out for Bainbridge and company. EQ

SISTERS IN ARMS

BAND: Little Sister
MEMBERS: Patrice Pike, vocals, guitar; Wayne Sutton, lead guitar, vocals; Darrell Phillips, bass, vocals; Sean Phillips, drums, vocals
LATEST RELEASE: *Free Love & Nickel Beer* [SBK/EMI Records Group], produced by Nick DiDia (engineer for Pearl Jam)
WHERE THEY'RE GOING: A nine-week tour through the Midwest, East Coast, Southeast and the South
HOW THEY GET AROUND: 16-passenger Ford van and Wells Cargo trailer
SOUND ENGINEER: Bobby Filarowicz
CONSOLE: Soundcraft or Yamaha 32 x 8 x 12 mixing console (Front of House); 32 x 12 monitor console
RACK: dbx 166 stereo compressors [6]; dbx or Audio-Logic quad gates [4]
EFFECTS: Yamaha SPX1000's or 900's [3]; Roland 3000 [2]
LOUDSPEAKER SYSTEM: We do not travel with a PA in tow; however, we require at least a 3-way system consisting of 18's, 15's, or 12's and horns. The number of cabinets depends upon the size of the venue.
AMPLIFIERS: Crown Microtech or Crest Audio
MICS: Vocals — beyerdynamic 480 [2] and 580; Bass — AKG D112; Guitars — beyer TGX 180, Countryman D.I.'s; Drums — Sennheiser 421, Shure SM98 and SM57, Audio-Technica ATM-33R
BEST LIVE EXPERIENCE: Little Sister states: Our last night at The Black Cat Lounge in Austin, TX. Some problems occurred, so we packed up our gear, walked down the street to the Steamboat and played a free show. 700 people ended up following us to watch us play.
WORST LIVE EXPERIENCE: Little Sister continues: The Bird in Houston, TX. We clapped for ourselves because no one was listening. I don't think anybody knew we were there!
TOUR TECH TIPS: Little Sister advises: We find ourselves always learning something new, whether it is technical or personal. My advice to sound engineers and road runners in general is summed up in four basic theories:

There is no room for attitudes.
Subtlety is the best policy.
Loud is not a necessity, but clarity and cleanliness are musts.
Avoid the rut and don't be afraid to experiment. EQ

ROAD WARRIORS

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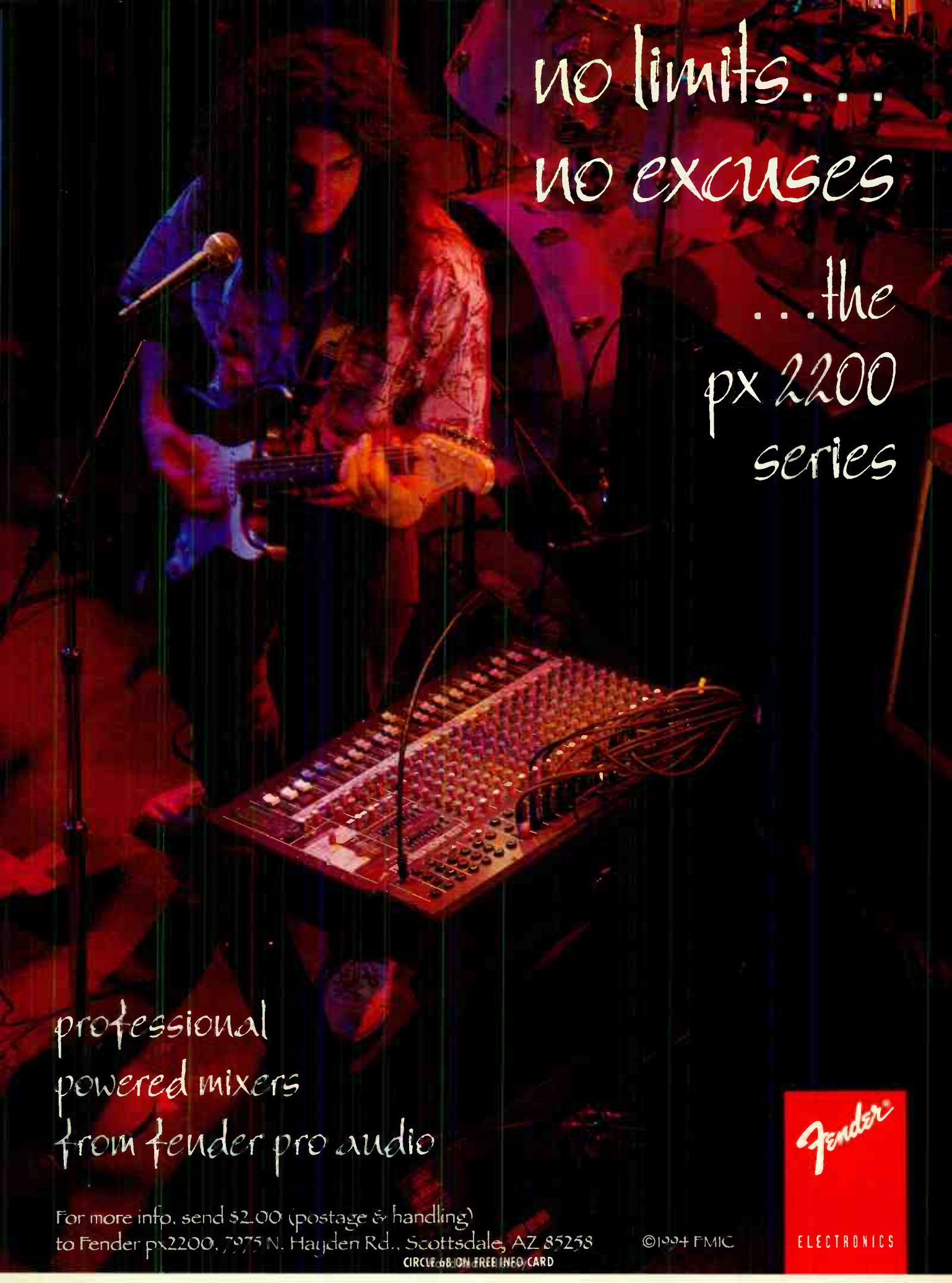
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APHEX MODEL 105 4-CHANNEL GATE

■NOISE GATES, or simply "gates," have been the most common tool used to thwart noise problems such as hiss, buzz, hum, and instrument leakage. A gate is a brutal form of dynamic expander that increases the difference in level between the sounds we want to hear from a particular source and those that should never have been there (in that ideal world that we never get to work in). The ideal gate would be one that takes up almost no rack space, has all the important controls on the front panel, provides a control range that copes with problems from any audio source, and sounds so good that the listener is never aware it is there.

Aphex Systems is known for building dynamic processors sought after for their excellent sound quality. The new Model 105 Logic Assisted gate brings the most essential functions of the Aphex Model 622 gate into that very competitive under-$500 market. Because sound quality was something that Aphex has vowed never to compromise, the 105 has been a long time coming. In reducing the cost of its latest gate, Aphex has been able to maintain sound quality by reducing the cost of the power supply (a wall-wart external transformer) and using resistors to "pseudo-balance" the audio signal. Control functions have been focused on the job at hand, and, although targeting the cost-conscious part of the audio market, the Model 105 still provides controls to handle most gate applications to anyone's satisfaction. Four gates fit into one rack space and include external key inputs for triggering the gate from another sound source.

Each of the four gates includes Threshold (–50 dB to +20 dB), Attack Time (200 µs to 250 ms), Hold (1 ms to 1 second), and Release (150 ms to 4 seconds). A push-button selects the drop in signal level that occurs when the gate is closed: 6 dB or 90 dB. Switches for bypass and for injecting the external key input have been jettisoned, allowing the unit to maintain a clear and uncluttered front panel. A bicolor LED indicator for each channel displays gate open (red) and gate closed (green). A second red LED indicates the presence of a phone jack in the external key input. These are bright, large LEDs and should be visible even in direct sunlight.

The Model 105 is the easiest gate I have ever used for cleaning up a drum sound. The short attack time setting retains the snap of the drum stick, and after setting short hold and release times, the threshold can be used to retain just the right amount of after-ring. You can even decide how much of the snares (those rattling wires under a snare drum) should be heard. Gates often require you to fiddle with the settings to achieve these results. The Model 105 does away with much of that, yet retains selective control over hold and release times.

In live sound, a gate is commonly used to reduce the bleed from monitors and other drums into each drum mic — an essential part of making six or more drum mics open only when their drum is hit and not just feed stage noise into your main mix. Of course, setting of a noise gate is never automatic; there are too many variables from one time to the next, but it doesn't get much easier than with this Aphex unit.

I have always used the Range control to select just the right amount of attenuation for a particular task. Too much, and the leakage of drums into the vocal mic is gone but so are any softer comments the singer makes to the audience between songs. Too little, and the gate is just a light show. Aphex has bet that 6 dB (1/4 power) and 90 dB (muted) are the most common settings for gates. Fair enough. I may prefer 10 dB (half-volume) in some situations, but maybe this is a feature that is worth spending the extra money on more sophisticated gates for just one or two sources. These days it's not uncommon to

ROAD TEST

MANUFACTURER: Aphex Systems Ltd., 11068 Randall Street, Sun Valley, CA 91352. Tel: 818-767-2929.

APPLICATIONS: Reduction of background noise from line level sources and special effects for both live sound and recording.

SUMMARY: An extremely easy-to-use gate that still retains operational flexibility.

STRENGTHS: Excellent control ranges; clear indicators; great sound quality for the price.

WEAKNESSES: An external power transformer (wall-wart); only two range settings.

PRICE: $449 **EQ FREE LIT. #:** 118

BY WADE MCGREGOR

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Mike Pinder likes to keep his Mellotron mellow.

"Part of my bliss is having The CardD at my fingertips. The CardD has become an integral part of my studio, being permanently connected to the output of my mixing console. I am very impressed with this product. It's a pleasure to use, and I am equally impressed with the people who stand behind it."

Songwriter, vocalist, and keyboardist Michael Pinder, formerly with the Moody Blues, is famous for his pioneering use of the Mellotron. The hauntingly beautiful sounds of this instrument became the trademark of the group's early works.

Mike is back in the studio, and has just released a new CD called *"Off the Shelf."*[1] Mike's new CD *"has a jazzier, more sophisticated flavor than his music with the Moodies, while retaining...'that heavenly atmosphere.'"*[2]

When it came time to digitize his recordings for final mastering, Mike trusted only one system. *"...at the end of the chain I mix directly to an IBM clone computer running The CardD™, by Digital Audio Labs... It's fabulous, for a thousand dollars, and it has incredible editing and the A-to-D and D-to-A converters are the best I ever heard. I do all of my mastering there."*[2]

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[1] Mike's CD is available exclusively through Higher & Higher, P.O. Box 829, Geneva, FL 32732. Send SASE for information.

[2] From Higher & Higher, an independent fan magazine focusing on the Moody Blues, Winter/Spring 1994

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have 10 channels of gates in a studio or live mix rack. The Model 105 is probably right for at least eight of those tasks, unless you insist on having frequency-conscious gating everywhere. But the Model 105 will only use up two rack spaces to provide those eight gates.

The Model 105 external key input offers the user many possibilities, such as tightening up a bass and kick drum. Keying the gated bass track/input from the kick drum allows you to have the bass and kick drum begin their notes together and, by adjusting the hold and release times, to also control the sustain of the bass. Reducing studio headphone leakage on a vocal track is also very easy. Set the threshold such that when the vocalist takes a breath before each phrase, the gate opens, then set the attack midway so no clicking occurs and adjust the hold to prevent the gate from closing between words in a single phrase. The release time is adjusted to fade out just quickly enough so that leakage doesn't get to solo.

The clicks that gates produce when set to fast attack times are not actually the gates' fault. They are simply opening within an existing audio signal that isn't at a zero-crossing. It's the same kind of click one can get when editing. The only solution is to reduce the attack time (fade in) to suit the instrument. This "click" is a bonus when gating percussive sounds because it adds to the transient of the instrument, but is obviously foreign to strings or vocals.

The Logic Assisted aspect of the Model 105 is a reference to the special circuitry that enhances the transients in the detector sidechain. This feature allows the Model 105 to discriminate between very slight differences in the levels of the sound you want and the noise you don't on the assumption that the noise will be less transient in nature. This makes the threshold adjustment quicker to tune in and much more selective, and makes the gate less prone to false triggering (chattering).

Those who deal with sound reinforcement for corporate clients may find the Model 105 useful as a simple automatic mic mixer. By reducing all mics that are not currently being spoken into by 6 dB, a significant advantage in gain-before-feedback can be achieved. The 6 dB drop still allows those who speak below the gate threshold to be slightly audible. This is no replacement for sophisticated automatic mic mixers that use rules (such as a 3 dB reduction in total system gain for every doubling of open microphones) to handle this task and don't open other mics when a voice is loud enough to cross the threshold between two adjacent mics. If you are only occasionally presented with this task, the Model 105 may be able to help.

The 6 dB range setting is also useful in highlighting instruments in the mix or just knocking the vocal mics back a little when they're not in use. I especially like to use gates to create effects. Back in the '70s, we built our own gated reverbs using a noise gate and an EMT plate, but now gate effects are used for more subtle applications. The 90 dB range can be used to bring in the ambient drum mics, keyed from the accented snare hits. This range can also be used to add an extra channel of an instrument, with different EQ just for the loudest notes — dramatically changing the color of the instrument on these accents. A tool that

World Radio History

can add to the dynamics of a performance and do it so reliably is a great asset in creative mixing.

The back panel of the Model 105 sports 1/4-inch phone jacks that accept both three-conductor plugs (for pseudo-balanced operation) and two-conductor plugs for audio connections. The nominal level switch at –10 dBV is pseudo-balanced and the nominal level switch at +4 dBV is electronically balanced. The power is supplied from a 24-volt, 600-ma wall wart, which removes the transformer from the case. This is an advantage for noise and weight, but these things are a real pain to keep plugged into a power bar on the road. They also use up way too much space at the AC outlet. The Model 105's internal construction is of a very high quality, with the three PC boards mounted rigidly in place. Also inside are four of the famous Aphex 1001 VCAs, well known for their excellent sound quality. If you can work around the external power transformer problem, this will be a very roadworthy piece of gear.

The frequency response and crosstalk of the Model 105 are excellent; the noise floor is below –86 dBu when the gate is open and well below –100 dBu when it is closed. Rear panel switches accommodate both –10 dBV and +4 dBu nominal signal levels. The Model 105, at just over $112 per channel, will be an excellent tool for those who want to clean up tracks from their compact digital multitrack or kill the leakage from mics onstage. The range of control even allows the sophisticated user to create special gating effects, not something many low-cost gates can do. EQ

APHEX MODEL 106 EASYRIDER 4-CHANNEL COMPRESSOR

The Aphex Easyrider™ compressor might be the easiest-to-use compressor you've ever seen. That, however, doesn't mean it is simple. The complex threshold design of this unit makes it the least obvious-sounding two-knob compressor ever built. Going beyond a soft-knee type threshold, the Easyrider slowly varies the compression ratio over approximately 35 dB to make the transition from slight to radical compression much less obvious.

The scarcity of control knobs on the front of this 4-channel compressor may make some veteran audio techs overlook the Easyrider, but try it out first. Each channel offers only a knob for drive and output levels and switches for slow/fast and bypass. Doesn't seem like much control over a complex job of compressing a vocalist one time and a kick drum the next. However, the excellent results achieved by this seemingly simple device on a wide range of audio sources belie the paucity of control knobs.

The Drive control is essentially the input gain for the compressor, which has a fixed threshold. Operationally, this progressively increases the level of the signal while adding more compression. I have always preferred to have a unity gain situation and to then just set a threshold that brings the peaks down to an appropriate level. Perhaps that was because compressors generally show themselves when used to really squash a signal; so I preferred, especially on vocalists, to just let a compressor ride the peaks like a gentle form of limiter.

The shock of using the Model 106 is that massive amounts of compression lack the artifacts that usually make you cringe when you hear the result. The unit can compress a wide variety of sources without any pumping, breathing, or sucking of the life out of the sound. It does that tough job of reducing a dynamic performance without any loss in the clarity or tone. If you want to create compression effects (artifacts) then this is not the unit for you: buy one with lots of knobs. But if you just want the levels smoothed out and nothing more, this is a great device for the job.

A button between channels 1 and 2, and 3 and 4 links the sidechain to create a stereo compressor. Obviously the drive (input gain) and output level must be matched to maintain the stereo balance, but once that detail is taken care of, stereo tracking is accurate. The Process On/Off switch bypasses all the active circuitry in the unit. This means the output level can be adjusted to match the level in operation and bypass, so the unit can be taken in and out of the circuit without anyone but you knowing.

Stereo coupling and a slow Process setting can be used to create a sidechain. This will allow you to create ducking effects, such as using longer reverb times on vocals. The voice is split to the channel 1 and 3 inputs, reducing the reverb (the channel 2 and 4 inputs) while the vocalist sings, but allowing the reverb to return to full level at the ends of phrases. This compression keeps the reverb from obscuring the words, but allows it to decay at a higher level after each line.

Unlike conventional compressors, where the attack and release timing is critical to reducing any compression artifacts, the Fast and Slow modes of the Model 106 can be used more creatively. There are few sound sources that will demand one mode or another, so you can use this switch to change the apparent reverb time (a fast release brings up the reverb decay).

The Model 106 has a 10-segment LED ladder that shows gain reduction in 2-dB steps. The meter is essential on this unit because you may not be aware of how much gain reduction is happening until you see the meter. Unfortunately, there is not a threshold indicator or any input or output metering. If you are overloading the input to the 106, the meter will dim.

The Model 106 combines the best qualities of dynamically variable ratio compression and simple and effective controls for just $449. If it weren't for the wall-wart power transformer and the hot bottom panel (from the internal voltage regulators' heat sink), there wouldn't be much to complain about. If you need to compress a few sources and don't want to spend a lot of money or waste any rack space, you should try this thing out. The Easyrider can kick the dynamics out of a signal and still leave the music (and transients) intact. —*WM*

World Radio History

Pinnacle Audio CD/CD-ROM Maker

EQ LAB REPORT

MANUFACTURER: Pinnacle Micro, 19 Technology, Irvine, CA 92718. Tel: 714-727-3300.

APPLICATION: Macintosh or PC peripheral that reads and writes audio CDs and CD-ROMs.

SUMMARY: Although somewhat temperamental, the RCD-202 does the job, especially for audio CDs.

STRENGTHS: Relatively easy to use; cuts audio CDs like a champ; updates continue to improve performance; high "gee-whiz" factor.

WEAKNESSES: Can't handle short files (under 32k), as required for many CD-ROM archival applications; poor documentation; requires a very fast hard drive for writing CD-ROMs.

PRICE: $3995 **EQ FREE LIT. #:** 119

THE RCD-202 ($3995) IS a compact, self-contained SCSI peripheral that lets you cut audio CDs and CD-ROMs on a PC or Mac (the Mac version is reviewed here). It reads Red, Yellow, and Orange book CDs, and writes Orange book (write-once) CDs (63- or 74-minute blank discs, for 580 and 680 MB, respectively). This sounds particularly appealing to *EQ* readers, since we're the kind of folks who want to make one-off audio CDs and back up digital audio (and other computer files) to a long-term, reliable storage medium.

The RCD-202 requires System 7.0 or higher with 4 MB of RAM, along with source material on a drive capable of at least 300k/second data transfer rates for audio CDs, and over 1 MB/second for HFS and ISO 9660 CD-ROM discs (more on this later). To install, you hook the RCD-202 drive to your SCSI chain (a terminator is provided), install a couple of system extensions, and run the program.

The software is relatively easy to figure out — a good thing, since the manual, though it tries, falls short of what's needed. Some menu options are not explained anywhere, and the section on cutting CD and file images is particularly cryptic.

HEAR, HERE—AUDIO CDS!

You can transfer AIFF or Sound Designer II files (stereo, 16-bit, 44.1 kHz) to CD. Each file creates its own track, up to the 99 permitted by CD

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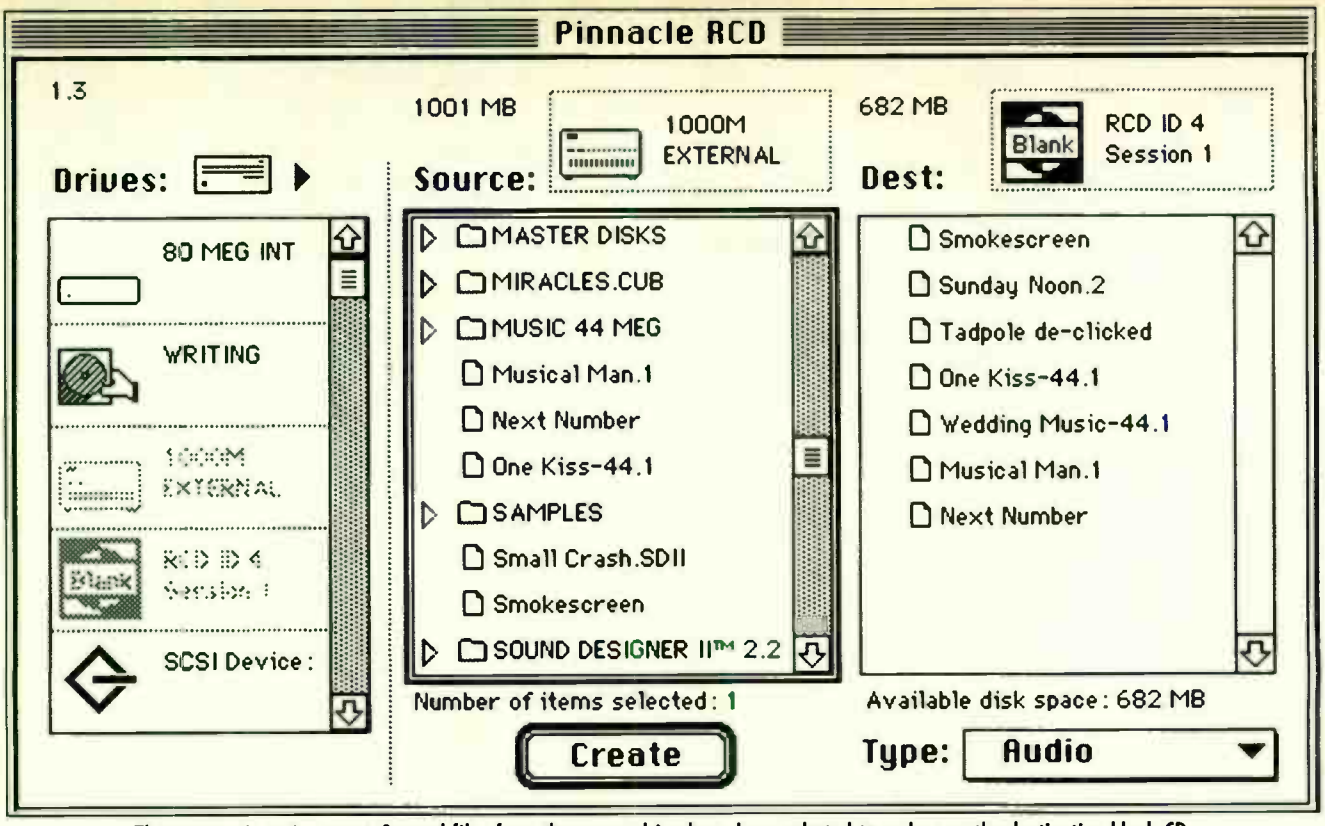

The program's main screen. Several files from the source drive have been selected to end up on the destination blank CD.

technology. You can set a gap between tracks of 0, 0.50, 1.0, 1.5, or 2.0 seconds (adding more space between songs requires adding silence to the end of a tune). If you cut one long file, you will not be able to cue up individual tunes.

Cutting audio CDs is painless and reliable, provided your system passes the 300k/second test. You can audition the results at the RCD-202 through a mini headphone jack or RCA phono outs, or play the disc in any conventional CD player (yes, even in your car, where we know lots of people judge the final mix anyway!). Aside from gap time inflexibility, this function gets a definite thumbs-up.

ALL ROADS LEAD TO CD-ROM

Cutting a CD-ROM is more challenging than it is for an audio CD. You must carefully optimize the source drive, and the RCD's small onboard buffer (64k) means that copying lots of small files (i.e., under 32k) makes the RCD-202 lose its mind and abort the CD recording process.

Faster drives give better file handling. The program tests your source drive and warns you if the transfer rate is less than 1.2 MB/second —something even my superfast multitrack digital audio drives couldn't do. This is only a concern when backing up computer files to CD-ROM; cutting standard pop tunes over to an audio CD is no problem.

However, the transfer speed requirement is not absolute. You can override the warning, and if you're transferring large files the drive doesn't need to be as fast. To keep you from trashing too many blank discs, the program can do a "dry run" of the disc-cutting process and predict whether the operation will succeed. This takes as long as the actual cutting and is not fail-safe; on two occasions the program predicted success but aborted shortly after starting as a result of the "short file" problem. (Thermal recalibration also disturbs the cutting process, but since these drives also wreak havoc with digital audio, I'll assume you're not using one.) You can get around the file-size limitation by using something like "Stuffit" to create a single, long file that represents the contents of a folder containing the smaller files.

If you want to use the RCD-202 to back up your main hard drive periodically, you'll probably be happier with a magneto-optical drive or other read/write cartridge system. But if you mostly want to back up digital audio computer files (e.g., Sound Designer, Cubase, Deck, Digital Performer, etc.) and do one-off CDs, the RCD-202 is just the ticket.

THE FUTURE

The software is not entirely stable (although it never interrupted the disc-writing process). Fortunately, Pinnacle seems committed to improving the product since the 1.3 release is vastly better than earlier releases. Also note that the RCD-202 can be a multisession recorder, which helps economize on discs and storage space. Of course, you need a multisession drive to read back multisession discs; standard CD-ROM players will read only the first session of such a disc.

If you want to cut only audio CDs and don't need CD-ROMs, you face a choice. Consumer write-once audio CD machines will theoretically be available later this year and may cost less than the RCD-202. On the other hand, if cutting CD-ROMs is very important to you, Pinnacle Micro will soon announce the RCD-1000, which is designed to write CDs at double-speed and includes a 1 MB buffer to alleviate the small-file limitation (projected price is around the same price as the RCD-202, with delivery slated for the 3d quarter).

Although you might want to wait to see how things shake out, bear in mind that it doesn't take recording too many one-off CDs for clients at $50 each to have the RCD-202 pay for itself. In any event, the act of cutting your own CDs is intoxicating, and with a little care and patience, the RCD-202 delivers the goods.

—Craig Anderton

Note: Thanks very much to DIC/DAT, who supplied the blank discs that gave their lives so that I could scale the RCD-202's learning curve.

World Radio History

TB Systems SoftMC MIDI Controller

EQ LAB REPORT

MANUFACTURER: TB Systems, 2205 Boston Road, BLD 0-144, Wilbraham, MA 01095. Tel: 413-596-8380

APPLICATIONS: Remote MIDI control from any Windows-compatible computer.

SUMMARY: PC-based software program that sends a range of MIDI messages from two banks of eight on-screen faders and buttons.

STRENGTHS: Easy to configure with excellent online help; includes comprehensive controls for the Lexicon LXP-1.

WEAKNESSES: Does not make use of all the typical Windows Operating System conventions.

PRICE: $59.95 **EQ FREE LIT. #:** 120

A MIDI remote control can add considerable power, flexibility, and speed to both project studios and live performance MIDI systems. A new program from TB Systems, called SoftMC, is a MIDI controller with a graphic interface that includes eight sliders and eight buttons on two independent pages (totaling 32 controls) for sending MIDI messages from any PC computer running Windows (see fig. 1). The PC must have MIDI ports installed, of course, but these are now available in a variety of forms — from parallel port adapters to multiport internal cards.

In the studio, SoftMC can give you access to MIDI control over your synths, samplers, and sequencers from a single program running on your PC. Controls that don't exist on some devices, such as pitch bend, MIDI panning, or expression controls, can be added and the range of control can be tailored to suit the task at hand. In live

Figure 1: The SoftMC MIDI remote control

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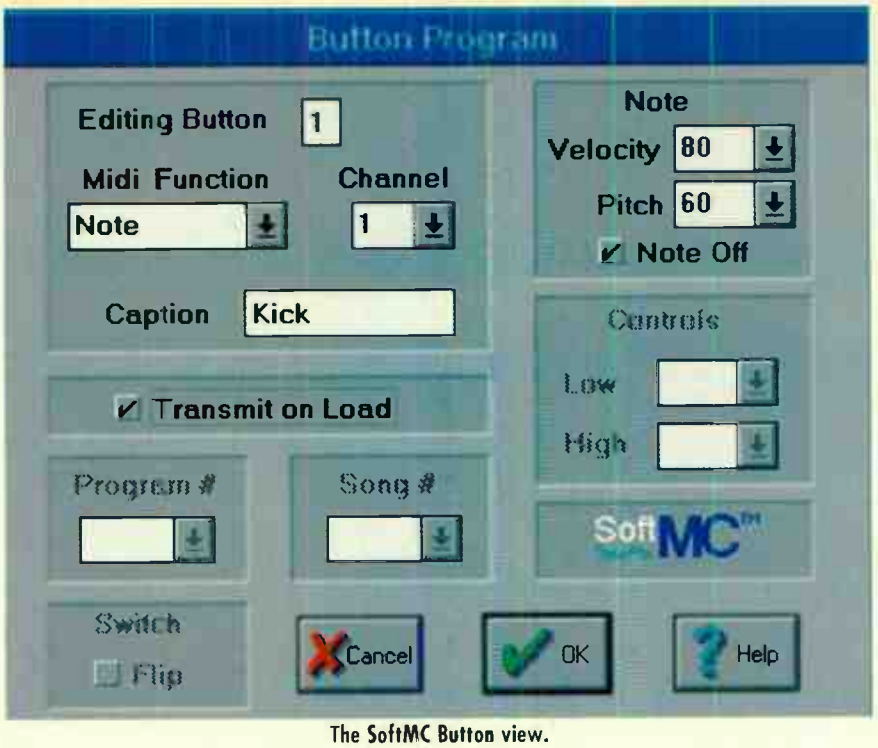

The SoftMC Button view.

sound work, a notebook PC can become the central control station for your effects devices and samplers. Changing effects programs, delay, or reverb times, chorus depths or flanging rates can be made from a trackball attached to the PC and within easy reach of the mix position. A little on-screen keypad can send program changes out to your MIDI gear with the click of a mouse.

The functionality of SoftMC is patterned after the Lexicon MRC [reviewed in *EQ*, December 1992] and builds on the features of that flexible stand-alone controller. Installation, typical of the some of the latest Windows programs, is straightforward. The online help takes the place of a printed manual and is direct and to the point. For those that prefer to have a printed manual, Windows Help will print out any section of the help file for reference.

A row of rectangular buttons activates the various operating modes and drop-down menus used to configure SoftMC. Another row of buttons, above the fader titles, selects the Machines and Setups stored on disk. There are two Page buttons, one to select between two sets of eight faders and the other to select between two sets of eight programmable buttons. Above each of the faders, and beside each button, are brief titles for describing the function assigned to that control. Beneath the faders are buttons that select that fader for programming (in PGM mode) or return the fader to the position where the Setup was last saved, creating a programmable default fader position.

SoftMC ships with a Generic MIDI Machine and the LXP-1 Machine included. Machines are groups of up to 128 setups. The LXP-1 Machine creates setups specific to the Lexicon LXP-1 reverb processor and the sliders send System Exclusive (sys ex) messages to the LXP-1. The LXP-1 controls include all the same parameters as the Lexicon MRC for the eight different algorithms within the cost-effective little effects unit. By loading any of the 32 supplied LXP-1 setups, immediate access to all of the controllable parameters is achieved and the eight faders are labeled with a five-character name of the parameter. Instantly your LXP-1 has a complete virtual front panel and 32 new presets with continuous control over their parameters. The buttons are not pre-programmed in the LXP-1 Machines and can be assigned to the same MIDI parameter controls as the faders in the Generic Machines, plus Stop, Start, and Continue commands for sequencers and drum machines.

Generic Machines allow the faders to be programmed to any MIDI continuous controller (0 to 95), pitch bend, note, program change, or song number. The range of data output from a fader can be selectively reduced from the standard 128 steps to 0 steps, allowing the entire fader

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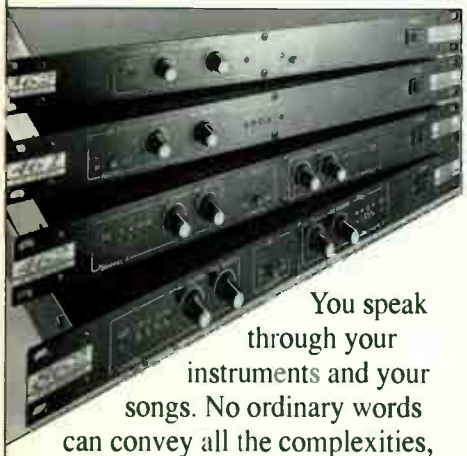

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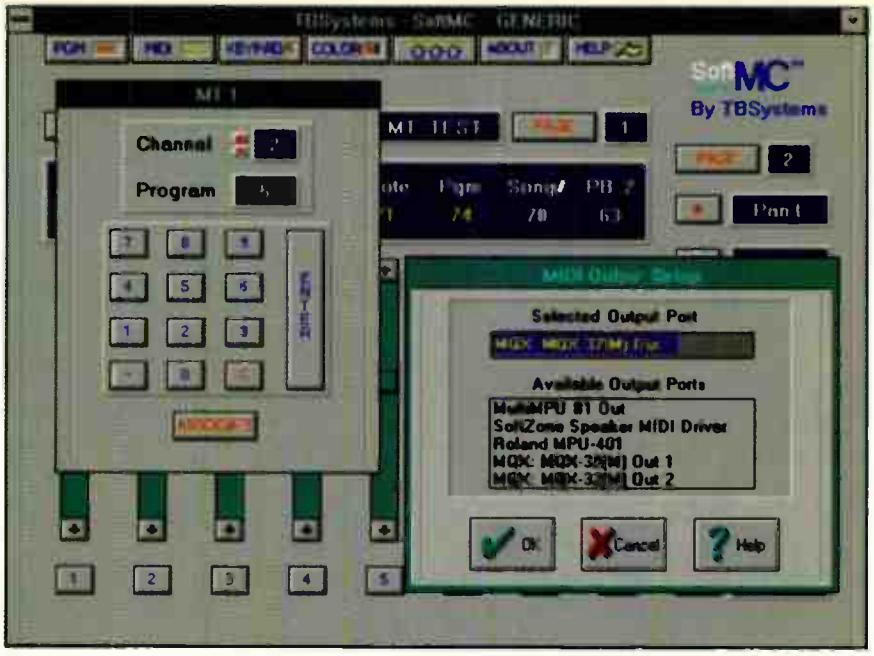

Figure 2: SoftMC MIDI Program Change Keypad and MIDI output dialog box

travel to transmit a specific controller range, such as a half-tone pitch bend range. The Generic Machine is the basis for building a MIDI remote control, starting with the eight Page 1 faders assigned to MIDI volume on channels 1 to 8 and the eight Page 2 faders assigned to MIDI pan for those same channels.

SoftMC, unfortunately, does not use conventional Windows pop-up menus, and this may prove confusing at first (see fig. 2). There are no close-boxes in the upper-left corner of many dialog boxes and instead the user must select the button at the top of the main screen to make some boxes, such as the keypad (for quickly sending MIDI program changes), disappear.

MIDI applications in Windows programs require a driver to communicate to the MIDI ports. These drivers determine how that communication can take place. I tried a number of different drivers, all of which functioned well with SoftMC. The standard MIDI interface for the PC is the Roland MPU-401, emulated by most of the other popular MIDI interfaces. Windows includes a driver for this interface, but other companies offer drivers with increased functionality. Music Quest [Tel: 800-876-1376] builds interfaces (I use their dual-port MQX-32M), and their driver (V 1.02) allows multiple MIDI applications to simultaneously access the MIDI port. You can run your sequencer and have SoftMC add in pitch bend and continuous controllers in real time. MultiMPU401(V 1.32), a driver from PG Music [Tel: 800-268-6272], will also allow internal MIDI communication between applications so that SoftMC controls can be recorded directly into your sequencer.

SoftMC is the best way to rediscover your Lexicon LXP-1 and the powerful effects processor buried inside. If you need to add a MIDI controller to your studio or live sound rig, and already own a PC, then SoftMC is a very cost-effective and powerful way to do it. For instance, on loading a Setup, any or all of the default fader and button assignments can be automatically sent out to your MIDI devices — instantly resetting your MIDI system.

Developer Thomas A. Boilard has created a simple, yet powerful MIDI controller, and because it is software-based, future revisions could add a tremendous range of new features and controls to the program. Version 2 was expected to ship in May 1994 and will add considerably to the functions included in version 1 such as built-in support for the Lexicon LXP-5, LXP-15, and the PCM-70 (V2 and V3) — and answer all of my minor criticisms! The new version will also add System Exclusive messages, expanding SoftMC applications into MIDI Machine Control and MIDI Show Control applications. If you want to double the value of your LXP-1, you must own this program. If you want to add MIDI control to your system, SoftMC is worth every cent.

—Wade McGregor

World Radio History

SWEET DREAMS

continued from page 48

hall ambience and trying to match gigs so they sound reasonably the same. I used as many of the natural hall sounds as possible and altered them with EQ because it's mostly how frequencies go around halls that makes halls different. I can't claim that I managed to make them all sound exactly the same, but I matched them fairly well.

"There was also the problem of spillage. Between the band it wasn't too bad, and sometimes it even worked in your favor, but the main problem was the vocal."

Romo also had to compress. "Loads. On most things, but particularly on the vocal. Annie was always moving around the stage, which is obviously not as controlled a situation as her standing in front of a mic in the studio, so you get discrepancies in level and tone. Most of the time I used a Massenburg EQ and compressor on her voice. There is a balance to find, because as soon as you compress the vocal you bring up all the background noise as well. In some of the quiet parts, where she looked away from the mic, the whole band came through. It's delicate stuff."

Was the choice of tracks judged on performance value, or sound quality? "Performance value. The quality was pretty consistent; there weren't any bad recordings because there were some good guys recording the sets."

Why was the project done on analog rather than digital tape? "Personally, I like a bit of tape compression. But as The Church is equipped with analog machines as standard and most of our material had been recorded analog, anyway, it made sense and saved a lot of messing around with the swapping of machines. I really don't think digital would have made much difference because it's a live recording, not a controlled environment, and as such it sounds live and trashy and that's part of the whole experience."

How was the album actually pieced together? "It was cut at Townhouse and sequenced on Sonic Solutions. It was an arduous process because of all the crossfades and because there were a couple of edits to shorten a couple of songs; sometimes they can go on a bit, live, and you just want to make it more condensed.

"We mastered to 1630 and, because each CD was one continuous piece, any EQ adjustment at the cut had to be done on the fly while the thing was running. That got kind of hairy as we got to the end of a side!"

Were any tracks particularly simple to mix? "'The Miracle of Love' was quite easy because it's a quiet track; the band wasn't roaring down the mics, which of course made it easier to handle. I can't think of any particularly difficult tracks.

"Admittedly, it's a lot of music, but it pulls you along. It's not an effort because you're working with something that's really exciting."

Stewart observes that the discipline involved in mixing a live album is completely different from that in doing a studio album. "With a studio album you're stopping and starting all the time — whenever the band has a new idea," he says. "With a live album it's all on the tape and nobody's standing around saying, 'Hey what if we have an orchestra on here?'"

Stewart is definite in his choice of his favorite track on the set. "I think 'I Love You Like a Ball and Chain' is mind-blowing singing and playing from a band in the middle of a concert that comes on like a steam roller. It's so tight and raw." EQ

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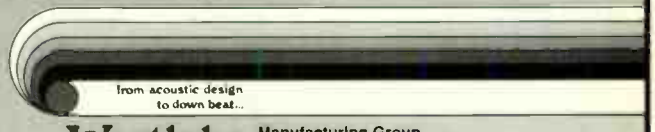

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Spring Cleaning

What you need to know to keep your nose (and studio) clean

BY EDDIE CILETTI

Keep it clean with maintenance materials like Caig's Pro Gold.

Let's get real. Eventually, your beloved gear will require maintenance. Don't take your toys for granted. Preventive maintenance should be a matter of course, but quite often it is approached with dread. By anticipating the needs of your personal multitrack, digital workstation, project studio, or multimedia facility, you may reduce the number of service calls, or at least be prepared for them.

PREVENTIVE MAINTENANCE LIST

1. When designing your "facility," no matter how small, leave room for expansion — especially for the patchbay. Interview technicians, consultants, and manufacturers before taking the plunge. Keep track of phone numbers, rates, availabilities, and specialties.

2. Own a service manual for every piece of gear.

3. Consult the manual and/or the manufacturer for proper cleaning techniques and recommended chemicals.

4. Cover gear when not in use.

5. Keep gear cool to prolong life.

6. Don't smoke, eat or drink around equipment.

7. Change the air conditioner, vacuum cleaner, and equipment filters regularly. Keep spare filters on hand.

8. To minimize static electricity, do not use synthetic carpet. Wear clothes made of natural fibers. Use conductive mats to minimize severe static problems (3M's products are very effective.)

9. Keep the following in mind regarding power line conditioners:

a) Metal oxide varistors (MOVs) are the "surge protectors" featured in economy power strips. Alone, they offer little protection. Additional components such as inductive/capacitive filters add to their effectiveness and weight.

b) The "heavies" are saturation transformer regulators that, in addition to spike protection, deliver constant voltage through brownouts and surges.

c) Uninterruptable power supplies (UPSs), also no slouches in the weight department, can maintain power during a failure. They are typically connected only to computers so that important files can be saved before powering down.

d) Most gear should be able to withstand line voltage variations and spikes. However, some are underdesigned and/or taxed to the limit. Just a little excess heat, or a nasty spike, and puff! Every little bit helps, especially proper ventilation.

10. Remeber that no matter how much you plan, something will go wrong. Try to accumulate spares (modules, power supplies, etc.).

THE ART OF TROUBLESHOOTING

You don't need a degree in electronics to swap a cable, a module, or even an IC. Getting back online is the goal, keeping track of the living and the dead is key. Be careful, be organized, be patient; that's the troubleshooter's motto.

Locate the block diagram or create one if starting from scratch. Burn the pictorial representation of the signal path into your brain until tracing a signal from input to output becomes intuitive. Augment this with "comparative analysis," the most effective maintenance tool. If, for example, a cable is suspect, all that's required is a working spare. If that doesn't resolve the problem, the source and destination must be scrutinized.

Mixers are particularly easy to troubleshoot because all channels are identical. In addition, the insert send and return ports can be interrogated. Worse than not being able to perform a repair yourself is not labeling what's bad or not remembering to send a bad module out for repair. *Always have a working spare.*

ZOOMING IN

At the opposite end of the spectrum, troubleshooting at the component level requires extensive knowledge of electronics, knowledge of soldering and desoldering techniques, well-maintained tools, and extremely sophisticated test equipment. Technicians who have all these give better service when you give the right clues.

WHERE TO BEGIN

Owning equipment is like eating a Dorito. After you've tasted one, you've got to have more! Probably the most

World Radio History

critical piece of gear is the mixer. More than the number of inputs, sends, or EQ bands is the importance of proper internal grounding. Mixers not designed to have every orifice connected will only be good for one boring tune: "HUMMMmmm..." Electronic "system" ground is analogous to the foundation of a building. Every piece of gear added will only antagonize a system that has a weak foundation.

For older gear, common failures can be traced to heavily used items such as switches, pots, faders, and pinch rollers. Keep spares of these items on hand. Heat, vibration, flexing, and stress shorten the lives of components, solder joints, cables, and connectors. A 5x–10x optical magnifier such as a jeweler's loupe helps spot cold solder joints.

MAINTENANCE SUPPLIES

1. **Water and water-based cleaners:** ammonia, Windex, Fantastic, Formula 409.

2. **A functioning vacuum cleaner.** Also have a clean paintbrush on hand for dusting hard-to-access areas.

3. **Alcohol:** either low-moisture isopropyl (up to 99%) or denatured.

4. **Metal polish:** Noxon or Brasso, for polishing patch plugs.

5. Polishing films: Polysand or 3M's lapping film (also for plugs).

6. **Component cleaner/lubricant:** Caig [Tel: 619-451-1799] DeOxit spray. From the folks that brought you Cramolin. A concentrated liquid and paste are also available, and the company has recently released a conditioning treatment called Pro Gold. Use Pro Gold if you would like to improve conductivity and protect your components from moisture and abrasion. It protects gold, base metals, and other precious metal contacts and connectors.

7. **A tool kit:** high-quality screwdrivers, metric and SAE hex keys and sockets, needle nose pliers, flush cutters, and specialty tools.

8. **A volt-ohm meter and/or cable tester.** For testing AC line voltage, batteries, power supplies, components, and cables.

continued on page 101

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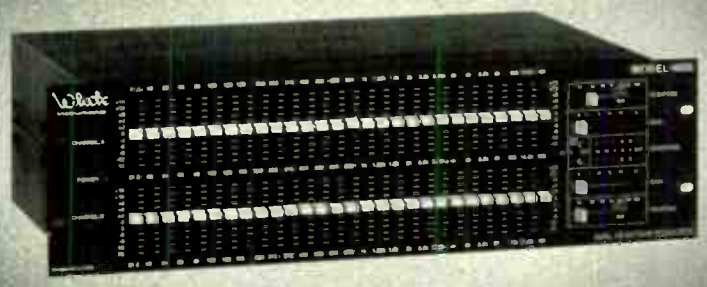

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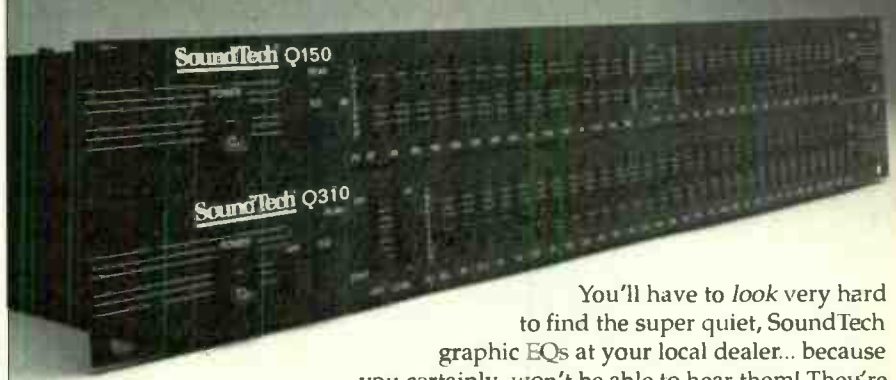

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Alesis Monitor One Monitors

THIS IS THE FIRST IN A SERIES OF PRODUCER AUDITIONS (NOT A REVIEW) OF A NEW PIECE OF GEAR THAT THE USER HAS ENTHUSIASTICALLY INCLUDED IN HIS OR HER PROJECT STUDIO, COMPLEMENTED BY A PROFILE OF THE DESIGNER'S DESIGN PHILOSOPHY.

BY BOBBY OWSINSKI

When I first arrived at The Complex studios in West Los Angeles with a pair of Alesis Monitor Ones, I must admit that I was greeted with a fair amount of skepticism. "These guys make stuff for home and project studios, not full-on pro gear," and similar comments, came from several of the people who were to be present for the first of many auditions. I had already been preconditioned to these comments, but having given the Monitor Ones to my friend Joe Braus at BrausHaus Studios in Van Nuys and gotten back an enthusiastic report, I had a feeling that their opinions just might change.

Let me just say that in the course of only a couple of hours listening to the Monitor Ones, comments changed from "Who are these guys?" to "When can I get a pair for myself?" Although there is little innovation in this speaker line, Alesis proves that anything is possible as long as good sound-engineering design is present.

Some background information first. The Monitor Ones are a pair of small mirror-image nearfield monitors utilizing a 6 1/2-inch woofer and a 1-inch dome tweeter and having the same approximate dimensions as the venerable Yamaha NS-10M's. A difference between the Monitor One and NS-10 is that the Monitor One contains a rear-mounted ducted port, which Alesis calls a "Superport," while the NS-10 is an infinite baffle type containing no ports or openings. The Monitor One has a usable frequency response of 45 Hz to 18 kHz (±3 dB) while handling 120 watts of program material and up to 200 watts on peaks. The unit uses an internal passive crossover network that operates at 2500 Hz with a slope of 12 dB per octave.

The lineage of the Monitor One is impressive. It was designed by former JBL designer Walter Dick (see sidebar) and former UREI designer Frank Kelly, who were part of the teams responsible for many of the best selling and most revered loudspeakers in history — such as the entire JBL 4300 series (*the* monitor standards of the '70s and early '80s) and the UREI 800 series.

World Radio History

Listening tests used a Bryston 4B as the power amp with program material coming either from a Sony 2500 DAT machine, an Adcom 6CD compact disc player, or a Studer 820 multitrack through a GML console. (Yes, that's right. The Complex has two of the three George Massenburg Labs consoles in the world.) The program material ran the gamut from pop to reggae, blues, classical, jazz, and rap.

In comparing the Monitor Ones with any other speaker system on hand, two things become apparent. First, the midrange was particularly smooth, allowing you to hear deeper into the mix. This resulted in an increase in clarity, with the harmonic structure very apparent in its detail. When listening to the Monitor Ones, you always seemed closer to the source, and in many cases heard details not noticed before. For example, when someone put on Tony Bennett's 1962 recording of "I Left My Heart in San Francisco" during a break, we were able to hear, on the chamber returns of Tony's voice, sibi-

WALTER DICK: MONITOR ONE DESIGNER

Walter Dick has been designing loudspeaker systems for the likes of JBL, Gauss, and now Alesis. With the help of fellow Harman alumni Frank Kelly, Dick has developed the new Monitor One nearfield monitor system. When asked if Dick and Kelly used any new design philosophy to give the Monitor One its performance, Dick gave a surprising answer. "We have no single philosophy; just whatever our instrumentation and our ears tell us, which is about 50/50," he says. "A guideline that I started using at JBL was to go from listening tests to measuring, and back and forth. We then got something that measured right and still had the right sound character for what the marketing people wanted."

So, if there is no unique or innovative design, then why do they sound so good? "It's just the way it comes out when you pay attention to detail, I guess," states Dick. "They're certainly not exotic; they're more of a straight-ahead type of design. The cabinet is built with no tricks, just whatever the design and the arithmetic call for in getting the enclosure and port to be the correct size. Selecting the right speakers comes after that, followed by getting a nice balance between them. Then you try to select the sensitivity of the system so it's properly applied to the work at hand. You have to watch the sensitivity levels, since a couple of dB up or down could make a big difference in the sound character of the entire system."

The crossover region is always critical in any speaker system, and that area sounded particularly smooth on the Monitor Ones. Was there anything special with the crossover network, perhaps? "There is nothing so special about the network except that, again, there is network trimming that can be done to adjust the sound character of the system, and it is pretty sensitive," states Dick. "Some people perhaps overlook that when they do a cookbook design. They don't audition the systems enough to decide just when they've got it right. You can manipulate the sound character quite a bit in direct radiator systems by just a small change in the crossover network. It's blending the system that takes a fair amount of time and then a lot of agonizing decisions about when to go with what you got."

There have been some new advances in the area of raw speakers that have helped the Monitor One, however. Says Dick: "Thanks to the demands of the auto stereo industry, small loudspeakers have now become very robust since they are made out of some fairly exotic materials that are practical at these smaller 1-inch and 6 1/2-inch diameters, but not at larger sizes. Also, with the now common use of ferro fluid in small drivers, the power-handling problems that used to plague small domes has also been eliminated . I think that both these factors contributed to not only the performance of the Monitor One, but to the performance of a lot of small systems that other people are making, as well."

And advances in measurement techniques and devices have also cleared the way for design improvements. "We have three main tools here that are computer oriented," Dick says. "We have the LEAP and LMS computerized measuring programs and an Audio Precision measurement set that we use. Instead of an anechoic chamber, we have a dead room that is much more in style these days to use with these computer measurement systems. You don't really need an anechoic chamber any more, and no one really has a chamber that's big enough to work below 90 Hz, anyway. Now the requirements are considerably eased with these computerized measurement systems since you really only have to cut the reflections down enough so that the system can do its work. So that's been a big advance, having these moderately priced measuring systems that let you do some of this work in modest circumstances."

Dick has no hesitation in explaining the obvious comparison with the Yamaha NS-10M's. "That particular unit is the one that everybody has," he says. "It wasn't so much that the Monitor One might compete with it but that it was an alternative to it. Before you start out building something, you want to evaluate the competition and see what the marketplace is listening to and why. We certainly used that one as a yardstick, but that design certainly did not influence our design any. We just set out to build the best 6 1/2-inch two-way monitor that we could. And I think that we were successful." —*Bobby Owsinski*

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lance that just wasn't apparent on other systems.

Second, the Monitor Ones sounded essentially the same at all volume levels, remaining smooth from low levels right up to those that were ear-splitting. This is something that really stood out because most of the other monitors we checked against would change their tonality considerably at different volume levels, sometimes being smooth, sometimes honky. The Monitor Ones sounded great even when working at the lowest levels, where, again, most of the others had a hard time keeping up.

So what's not to like? Well, for one thing, the Monitor Ones might be a little bright for some tastes. Nearly everyone that played with them during my monthlong evaluation would have liked a control that would enable the user to crank the tweeter back an ever-so-small amount, just to be on the safe side (to keep the mix from being dull). But for the most part, everyone learned to adjust to this factor after a very short time.

Was I impressed? All I can say is that if you already know and like the sound of what you're using, be they NS-10's or other monitors, then perhaps you have no reason to even give these babies a listen. But if you have the slightest doubt about what you are hearing with your present nearfields, then the Alesis Monitor Ones are one speaker system that you should definitely check out. EQ

Bobby Owsinski is an L.A.-based blues musician who spends most of his time as a TV and record producer. He also lectures at Trebas Recording Institute about his former lifetime as a recording engineer.

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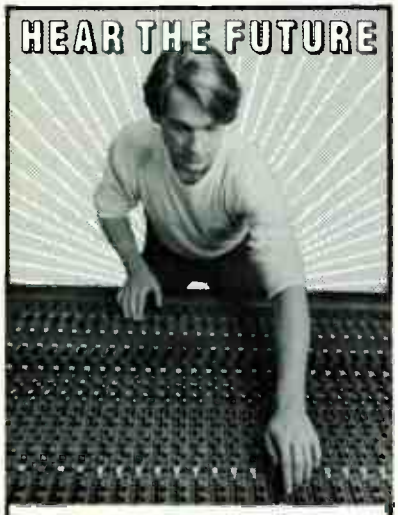

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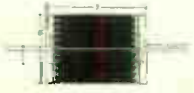

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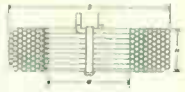

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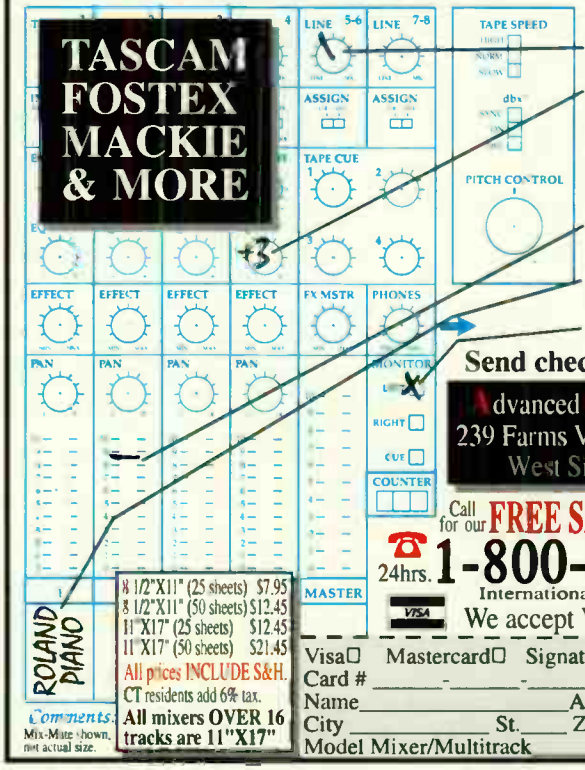

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Getting Connected on the Internet

If you plan on recording over the phone lines, you'd better get an agent — and a smart one at that

BY MARTIN POLON

The concept of jumping into your project studio and cruising down the nation's data highway has captured the imagination and creative interest of both the large and small studio crowd. The success of the recent Frank Sinatra album, *Duets*, which was produced with artists hundreds and thousands of miles apart, has become legendary. Several successful business activities have sprung up to provide brokering of the digital lines and remote digital linkages necessary for such a project.

Duets has emphasized the use of remote digital telecommunications that allowed various artists to perform with Sinatra without being in the same studio at the same time. What has not been emphasized is how that same technology can make the smaller studio a digital audio terminal for similar projects. For example, a Macintosh computer can be fitted with an ISDN (Integrated Services Digital Network) board in a NuBus slot and receive remote digital audio feeds via common carrier.

The use of remote digital technology can reduce the overall project expense of an album by shrinking the transportation and housing costs for various artists. The artists can record their tracks while performing in a studio near their hometowns or wherever else they may be, such as on tour.

It is a curious fact that the development of the new and improved technology of digital communications is moving at such a pace that one can only look back at *Duets* and similar projects and say, "That was then, and this is now." It is equally clear that the future of communications on this planet is going to evolve into a high-quality digital matrix capable of random access linkage from any point to any other point. The current method of using the existing switched telephone network, with its heavy dependence on existing copper lines, will be first augmented and then replaced by fiber-optic linkages — locally, regionally, and nationally.

More important, this and other systems developed will incorporate data/telecommunications-type switches that will integrate existing public-switched copper networks, fiber-optic transmission systems, T-carrier systems, coaxial-cable head-end-based TV redistribution systems, ISDN lines, microwave systems, and other newer systems as they emerge.

One key to the successful implementation of this future technology infrastructure is the use of ATM (Asynchronous Transfer Mode) with multiplexing of voice, music, data, still video, and full motion video. ATM is the international standard for cell relay of entertainment, education, and information at megabit to gigabit speeds. It is suitable for local-area and wide-area communications services. It is designed for voice, data, and multimedia over both public and private networks. It is an international standard, endorsed through the various domestic and international telephone and telecommunications carriers that sought its creation.

ATM is similar to packet systems except that the packets are called cells and have a fixed size of 53 bytes (a 5-byte header and a 48-byte payload) by agreement amongst the telephone company originators of the system. The system is optimized for "bursty" traffic, which the majority of the intended sources are capable of being at one time or another.

To take all of this technology one step further, the introduction of "smart agents" will provide users with "steerable" software that mimics the action of computer viruses and travels about networks and communication nodes to actually do the work of making a suitable path for intrastudio digital connection. These agents will provide all sorts of network capabilities for handling sending, receiving, and setup tasks without the need for human effort and intervention.

They have been designed to automate tasks such as data retrieval from particular files. An example of these files could be a listing of all studios set up to participate in intrastudio digital audio transfer on the matrix. It would only be necessary for the user to indicate what specifically was wanted and the software agent would go into action, circulating through all the available databases until the job was finished and then return with the retrieved data. It would not have any limits on time, at least in relatively long terms. The agent would work until the job was done — regardless of whether it took one minute, one hour, or one day.

Instead of studios depending upon setup contractors to arrange for digital interconnections, agents riding the new ATM networks, the enhanced Internet, the phone companies' ISDN matrixes, or fiber optics would be sent out with a specific task and return with links established for a particular time and place. The connection would be enabled when and where it was wanted and the only thing left for the user would be to pay the bill for the services used — a result of the connecting agent's contacting a charging agent to establish a debit protocol as part of its routine. EQ

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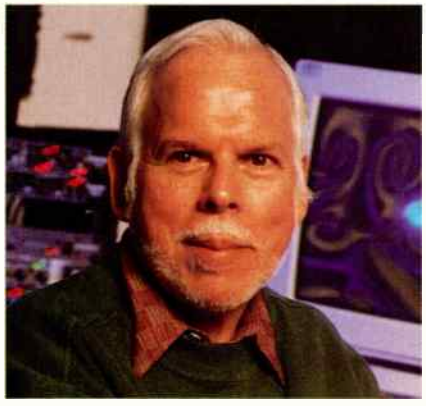
World Radio History

A House of Cards

Choosing the right sound card is the first step to successfully make your way down the multimedia trail

BY MURRAY ALLEN



There are two schools of video game development. The first has to do with the creation of music, sfx, and dialog for console games such as the Nintendo Entertainment System, the Sega Genesis, and 3DO. These devices are single-purpose computers. For the most part, they are intended to be used solely for game playing. When composing and designing sound for them, you have a clear target in your scope. Each of these systems has its own internal sound systems and your challenge is to get the most out of these dedicated samplers and synthesizers.

The other school of game sound development is involved with the PC world. The computers in this class are multipurpose computers. Playing games and creating sounds is just one of many, many functions on their menus. In fact, this class of computers relies on third-party developers to design and manufacture the silicon that creates the sounds. This causes a problem because many of these so-called sound cards are not compatible. In other words, when you are designing the sound for a PC game, you must decide what sound card you want the end users to install in their computers. Since this decision is pretty much controlled by market forces, the decision is really out of your hands.

Another problem inherent in the creation of sound for the PC market has to do with the large variety of features commonplace to the computers available in the PC marketplace. When designing a game for the PC market you must decide the level of quality and the level of data manipulation you want for your game. You must then make sure the label on your product clearly defines the specifications for your game.

The most popular sound card on the market is the Sound Blaster manufactured by Creative Labs. This card has FM music and 8-bit sfx. When game designers are programming their games, they take quite seriously the powerful market position held by the Sound Blaster. If you want to sell your game to the largest quantity of gamers, you must release it in a format that will support the largest number of PCs. Because of this, many other card manufacturers have emulated the Sound Blaster features in their designs.

Last year, 1993, brought 16-bit sampling and wavetable synthesis to the world at more competitive prices. This new class of cards allows playback of true CD-quality digital audio, but uses frequency modulation hardware for creating musical instrument sounds. This new class of cards also includes text-to-speech and voice-recognition programs and compression/decompression software to reduce the size of the sampled data files. Some of the leading cards in this category are Creative Lab's Sound Blaster 16 and Media Vision's Pro Audio Spectrum 16. Logitech SoundMan 16 and Sima Design's Winsound 16, two more contenders in this 16-bit arena, use the same Media Vision chip as the Pro Audio Spectrum 16 but offer different software and some variations in the hardware details.

There are about 13 important manufacturers of sound cards. Naturally, each wants the game developers to support its cards. As I stated above, though, the developers have to support those cards that have the largest market penetration. Although a handful of manufacturers controls over 90 percent of the market, there are features on all the cards that game developers would love to have available. Toward this end, the VESA (Video Electronics Standards Association) is developing a standard, the VESA BIOS Extension for Audio Interface, as a way to design a common driver standard for DOS sound cards. Whether the major manufacturers will agree to follow the VESA recommendations is questionable, since doing so would open the market to the smaller providers of sound cards.

More sophisticated PC users will oftentimes use more than one sound card in their systems. There are several General MIDI (GM) devices on the market that are capable of producing more professional-quality audio for the PC market. Some of these GM devices are the Roland MT32, Gravis Ultrasound, and the Roland Sound Canvas. These can be used along with the other sound cards to produce more professional-sounding music as against the synthesized music available on the earlier-mentioned cards. A very popular combination is the Sound Canvas and the Sound Blaster.

Although it is possible to create some great-sounding musical tracks using the PC, it is quite risky to expect the end user to have all the goodies necessary to reproduce your great work of art. This has been a constant frustration to the sound designers of PC games. Success seems to manifest itself in the ability to work successfully with the lowest common denominators.

Murray Allen is Director of Audio at Electronic Arts.

World Radio History

SPRING CLEANING

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9. **A soldering iron, solder sucker, and wick.** Temperature regulation means longer tip life and less damage to components. Solder removal via suction or chemically treated wire braid aids component removal.

10. **Spare parts:** ICs, transistors, power resistors, diodes, capacitors, and voltage regulators.

11. **Test equipment:** a tone generator (oscillator), waveform monitor (oscilloscope), and a variable auto transformer (for applying power slowly to questionable gear).

The above suggestions start with the most basic supplies that should be in every home. I cannot emphasize that owning a vacuum cleaner is not enough. You must change the filter bag regularly for the machine to be effective. Your brain is the best piece of test equipment. Even if you don't plan on component-level repair, turnaround time can be kept to a minimum if you keep spare parts on hand. Consult each manufacturer's customer service department for a recommended spares list or kit.

IN CASE OF A SPILL

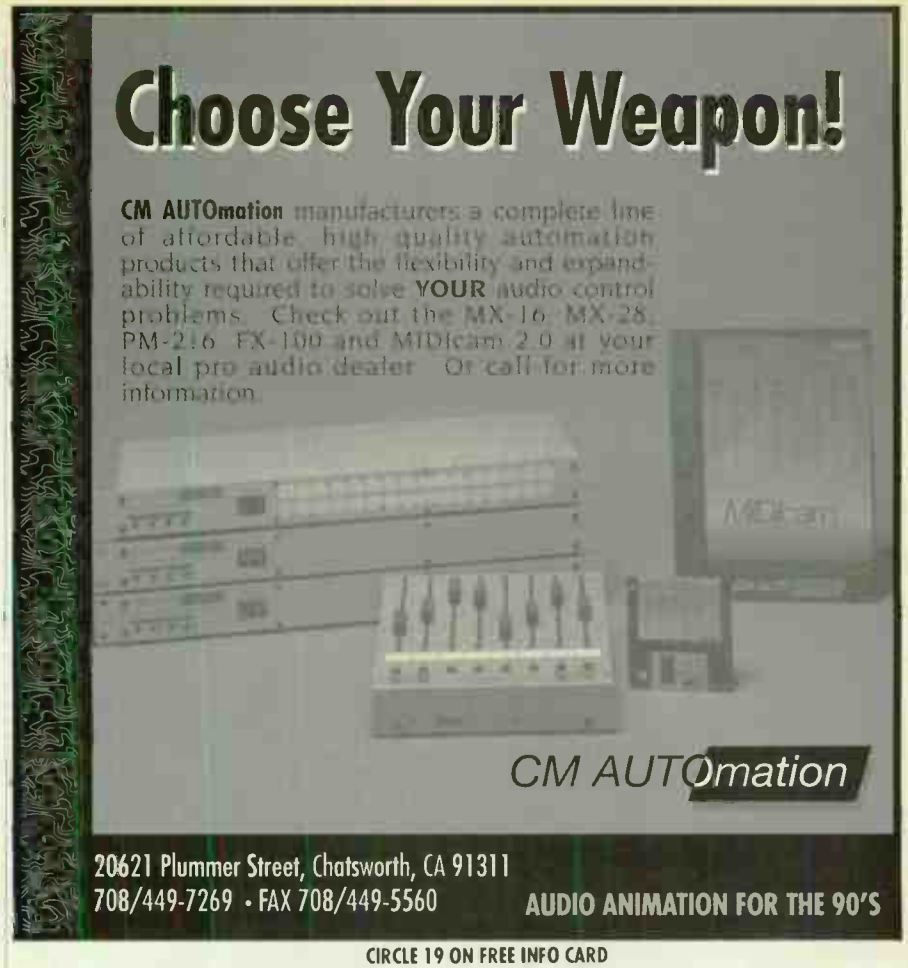
If liquid spills into your gear, disconnect power immediately. Then, if the liquid spilled was sugar-based, rinse with water. Disassemble gear, if possible, and dry. (A hairdryer will expedite the process.)

HOW AND WHAT TO CLEAN

Sometimes pots and switches get scratchy from lack of use. Don't indiscriminately spray from the top panel. The magic juices are not likely to find their way to the component in need. Spray cleaners are most appropriate at cleaning pots that are neither sealed nor readily disassembled. For mixers that are not modular, getting under the hood can be a pain. Once you have established visual contact, try to find an access hole, spray, and exercise.

Some faders can be disassembled — but before you try, get a couple of spares, just in case the dog grabs it when you're not lookin'.

Eddie Ciletti is president of MST, Inc., a multimedia product developer. His e-mail address is EddieAudio @ AOL.com



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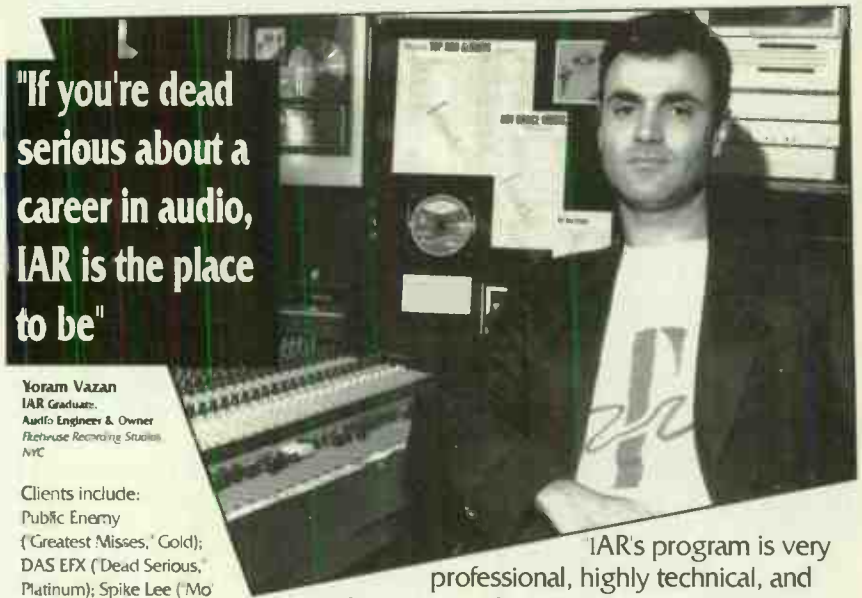

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POWER MACS

continued from page 62

Power Mac's GeoPorts, however, should be fast enough to transfer digital audio, and hopefully manufacturers will take advantage of that.

The Power Mac audio converters are reputed to be a step below those of the AV series, so adding something like a Digidesign card to handle digital audio I/O will probably be the option of choice for pros in order to get better high-frequency response and another 10 to 12 dB of signal-to-noise ratio.

If the AV series is so good, why bother with a Power Mac? If the Power Mac drives down the price of a hot box like the 840AV, that could be a better choice — especially since you can upgrade it to PowerPC status later on. Apple says it'll keep making 040 Macs so long as people want them, but that may take awhile. Look how hard a time it had killing off the Apple II line; killing the Mac could be even harder, at least for the short term. Fact: for around a $1700 street price, you can get a 660AV and do six tracks of digital audio that sound just fine. The Power Mac can't touch that (yet).

However, the Power Mac is the wave of the future. Its emulator lets you run Mac software now, and in the near future it will be able to run software that will really scream. With 68040 machines, you're buying into proven but "graying" technology. With Power Mac, you're on the leading edge of what will likely be a computer with a fairly long lifetime. The Power Mac is not a panacea, but it's a major step forward from the computers of the '80s and early '90s.

Apple's a survivor, but it has certainly been on shaky ground lately. Will these moves strengthen or weaken Apple? What's dragging Apple down is the hardware, because unlike clones — where people expect to buy Windows — customers expect Apple to give away the operating system with the machine. So Apple's had to cut the prices on hardware enough to compete with PCs yet include a superior operating system, which is tough.

Working in Apple's favor: people want smoother machines that are easier to use. At this point, speed is becoming less of a bottleneck than the interface to the user. If Apple maintains its lead in terms of the graphical interface and consumers decide the interface is more important than saving a few hundred dollars, Apple will prosper. If Windows 4.0 hampers the incentive to get a Mac, then Apple will have hard times ahead — unless it can leapfrog past 4.0 in a relatively short time.

The bottom line is that the Power Mac is significant — particularly for the audio community — because of its ability to do digital audio, its speed, and its overlap with the rest of the world (i.e., with IBM). I'm sure I won't be the only musician lining up soon to buy into what appears to be very exciting technology.

Acknowledgments: I'd like to extend my deepest thanks to several people who gave generously of their time and knowledge for this article: Josh Rosen and Mats Myrberg (OSC), Peter Gotcher (Digidesign), Chris Halaby and Rob Poor (Opcode), Mark Badger (Steinberg), Mikail Graham (Emagic), and Jim Cooper (Mark of the Unicorn). EQ

POWERBOOKS

continued from page 65

thousands of colors with a slightly reduced image area (640 x 400 pixels) or 256 colors (8-bit) in 640 x 480 mode. The 520 and 540 color and grayscale displays measure 9.5 inches diagonally, while the Duo 280's grayscale is 9 inches diagonally. The active matrix display of the 280c measures 8.4 inches diagonally.

Modem capability has been considered from the beginning. The 540 models are available with both Express Modem II and Global Village fax/modem boards, and these can be added to 520 models.

Last on the feature list is Ethernet compatibility, which is delivered on the 500 series PowerBooks with a FriendlyNet connector for thick, thin, or 10-baseT cabling. Given the expanding need to transfer large-sized files, this capability may become indispensable.

COMPATIBILITY

End users will probably be very interested in the question of compatibility; after all, when the PowerBooks were first introduced there were quite a few problems making MIDI fly. Apple did resolve all of these over time. We attempted to find out if Apple had sent any software developers machines to test, and from what we were able to discover, Apple hadn't. That's the bad news. The good news is that Apple's PowerBook division did order copies of most popular software from the devel-

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opers and is said to have tested them for compatibility. Most developers were told that "no news is good news," meaning that if they didn't get a call, everything was going fine. Nobody we talked to got a call, so chances are excellent that compatibility is one hundred percent. After all, we're primarily talking about an upgrade in processor speed, not a radical change in either bus or processor architecture. So you can probably move into a new PowerBook with no paranoia about its working correctly. The PowerPC should provide more challenges all around.

So what, if anything, are the practical applications in the world of audio and music? Certainly speed and long battery life, combined with massive RAM capability, are excuses in their own right to acquire a new PowerBook. The Duo, combined with its new DuoDock II, can handle NuBus cards, thus combining digital audio capability with a high degree of portability (although you'll need to schlep the Dock with you to make your digital audio transportable).

A possible glimpse of new possibilities comes from Opcode, with its recently-released Studio Vision AV and Studio Vision Pro. Both are written to be compatible with the Sound Manager that's part of Apple's operating system (a first, according to Opcode). That means they can take advantage of whatever audio is built into a given Macintosh system, since the Sound Manager takes care of whether or not you're dealing with the bit resolution of the Mac's repro system. Both programs also employ nondestructive graphic editing.

Opcode described the following scenario to us: you're working on a complex mix using SoundTools or ProTools hardware, and it's time for your dinner break — or you'd like to refine a track at home. Providing you have enough hard disk space, you can download the file (or a composite of some tracks, such as vocals) to your portable, and use the built-in audio, perhaps with headphones, to put together the edits you want. The data file can then be uploaded back to the main computer after the break. The result is something akin to offline editing, a mainstay of the video world.

Whether you edit your audio over a plate of lasagna or just use a portable computer for mobility, the new PowerBooks offer a host of benefits to anyone trying to put his or her act on the information highway. Now you can phone in your part in style. EQ

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ACROSS THE BOARD

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about an hour just to deauthorize them all. Vision, Track Chart, Galaxy, DINR (noise reduction plug-in for Sound Designer II), Q10 (parametric EQ plug-in for Sound Designer II), MasterList CD, and now Sound Designer II all have to be deauthorized in order to reauthorize them later. If you forget, you cannot recover the lost authorization count.

If you follow the software vendor's rules, you should own a licensed copy for each computer on which you run a piece of software. If you only use one computer at a time, you should be able to have a copy on each computer without having to purchase another copy. When I am at home, I use the Vision that is installed on my Mac IIci. When I am on the road, I sometimes use Vision from my PowerBook. I have never had to use them both at the same time, so I feel that I should only have to purchase one copy of Vision for the two computers.

Because of crashes, I elected to buy another copy of Vision for my Powerbook just to have the extra installs for those times when the hard disk says good-bye. My wife has a Mac IIcx that she uses to write songs on. I purchased an additional copy of Vision for her so she would have the manual and the additional installs if she had a catastrophic crash while I was out of town. That means that I have a total of three licensed copies of Vision, two licensed versions of Galaxy, and one licensed copy of Galaxy Plus Editors.

Because of the crash possibility, you must carry with you the original master disk to deauthorize and reauthorize the software. On a trip to somewhere far away, I found out the hard way that the deauthorization can only be done from the exact disk that did the authorization. I had to replace my Powerbook hard disk with a bigger one. I had to deauthorize the hard disk install of Vision before removing the old hard disk and installing the new one. Then the message came up that "this is not the disk that authorized Vision to run on your hard disk." Bummer. Since the serial number is not available anywhere except on the first original disk, there is no way of knowing after the fact which Vision is installed on which computer. I lost an install in this instance, and it will probably happen again in the future.

I am not just picking on Digidesign and Opcode, it just happens that their software is what I use on my computers. Similar things happen with other copy-protected software. I used to have a policy of not buying copy-protected software. But what can you do after doing five years worth of projects on one brand of software and then they implement copy protection. You're stuck.

If software companies are going to copy protect their software, I have a suggestion that would help with the problem of having to carry 100 floppy disks with you wherever you go. In the authorization process, they could also allow you to authorize a floppy "key" disk. You could authorize the key disk for Vision, authorize the same key disk for Sound Designer II, Track Sheet, DINR, and whatever other software you had. This process would not detract from your number of available installs. Now you would just carry around one floppy disk that could be used as a key to all your protected software. If you ended up losing your hard disk authorization, this universal key disk could be used to allow you to run a protected program in the same way that the original master disk acts as a key to run an unauthorized program. The difference is you only need to carry one disk, and not a briefcase full.

Don't take any wooden yen, and I'll see you next month. EQ

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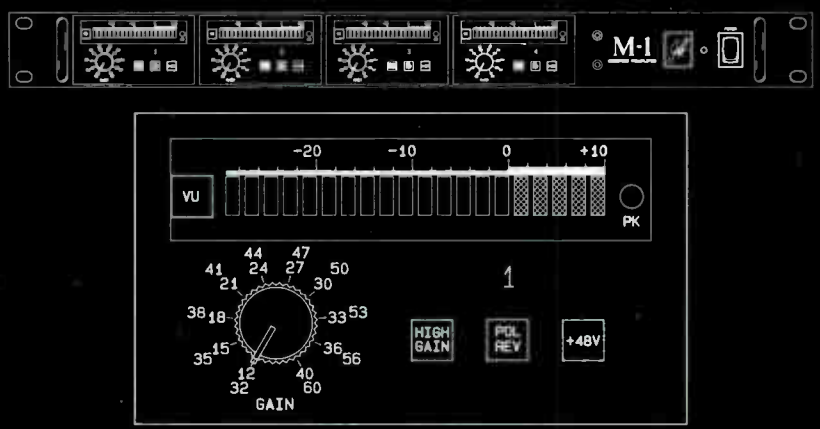

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Across The Sea

Taking the trip from Japan to copy-protection hell

BY ROGER NICHOLS

As I write this column, we have just lifted off from Norita Airport, Tokyo, bound for Los Angeles after a two-week Steely Dan tour of Osaka, Nagoya, Tokyo, and Fukuoka. It was great. Everyone warned us that Japanese audiences were more reserved than American audiences, but the third show in Tokyo at Yoyogi Pools had people standing and crowding toward the stage, just like anywhere else.

The local music stores were barren of any Steely Dan recordings, having been sucked dry by the frothing Steely Dan fans. It wasn't only the Steely section; there is another Roger Nichols who used to write songs with Paul Williams ("We've Only Just Begun," "Rainy Days and Mondays," etc.) and who had a solo album out about 1968 called *Roger Nichols and A Small Circle of Friends*. Steely Dan fans in Japan thought it was mine and bought every copy in Japan. Dozens of them came to me wanting me to autograph their copies. I plan on getting in touch with Roger and asking for a percentage of his big royalty surge from those Japanese CD sales.

Steely Dan management faxed ahead a list of the songs that were going to be performed. Somewhere along the line the information must have been communicated by voice, because the guitar player, Drew Zingg, became Drem Zig, and one of the song titles went from "Book of Liars" to "Box of Rears." I guess it could have been worse.

Actually, what was worse were the prices. With the dollar so weak against the yen, electronic items such as DAT machines, CD players, Walkmans, and computers are much cheaper in the U.S. Food is also much cheaper in the U.S. I should have taken a few dozen doggie bags from the hotel in L.A. before we left for Japan. An apple was $6.50. A glass of orange juice from concentrate was $6, while the fresh-squeezed variety was $11. Breakfast for two hovered around $52 and lunch at the Chinese restaurant in the Okura Hotel in Tokyo was $450 for four people.

Of course, I had to visit all the Japanese versions of the American food factories. "MakuDonurudo" is roughly the pronunciation for McDonalds, where a Big Mac cost $6.50. Wendy's hamburger combo consisted of three french fries, a kid-sized Coke, and a hamburger the size of a silver dollar with a piece of meat so thin that if you held it edgeways you might not be able to see it.

I also sampled Carl's Junior and Dunkin' Donuts. I feel that it is part of my job to check on these establishments of American goodwill whether I am in New York or Moscow. Besides, after I buy the latest audio gear, I can only afford to eat at fast-food restaurants. It's the Gear Slut thing to do.

MASTERLIST CD & SOUNDESIGNER 2.7

With bigger and bigger hard disks finding their way into computers, CD mastering right from audio files on your Mac is becoming more commonplace. Digidesign has upgraded its Master List utility to allow the sequential spooling of multiple files to either a SCSI-based CD recorder or a CD recorder connected to the AES digital interface. With a SCSI-connected CD recorder, you can also automatically insert start IDs onto the CD as well.

The previous version of Master List would allow you to play separate sound files in the order you selected, but you could not perform any level changes or crossfades, capabilities necessary in the CD mastering process. The new version has fixed that. The selection to be played can be a complete sound file or a region selected by Sound Designer II within a sound file. The playback level can be adjusted, as well as the type and duration of the crossfade between selections. I have used MasterList CD to compile a CD that was subsequently sent directly to the CD plant for replication. It worked flawlessly.

I just got an update to Sound Designer II, Digidesign's audio editing software for the Mac. On the plus side, they have added a feature that allows you to compare two equal-length audio files. The difference between the two files is stored as a new audio file. You can then listen to the difference file. If you removed noise from a file with DINR and then compared the results with the original, the difference file should contain the noise that was removed. If you hear any music in the result file, then you have probably removed too much noise. Cool.

COPY PROTECTION

On the negative side, Digidesign has copy protected the software, starting with version 2.7. The software must be authorized from the original disk. You are only allowed two authorizations, so if your hard disk crashes often, you could end up with no hard disk runable editor.

With more and more models of Macs hitting the street every day, the chances of a crash increase. If you tell me your Mac has never crashed while running a music-related program, then the only reason you have the program is to impress your friends with the cool sign-on logo.

Right now, if I want to do something to my hard disk that requires me to remove copy-protected software, it takes

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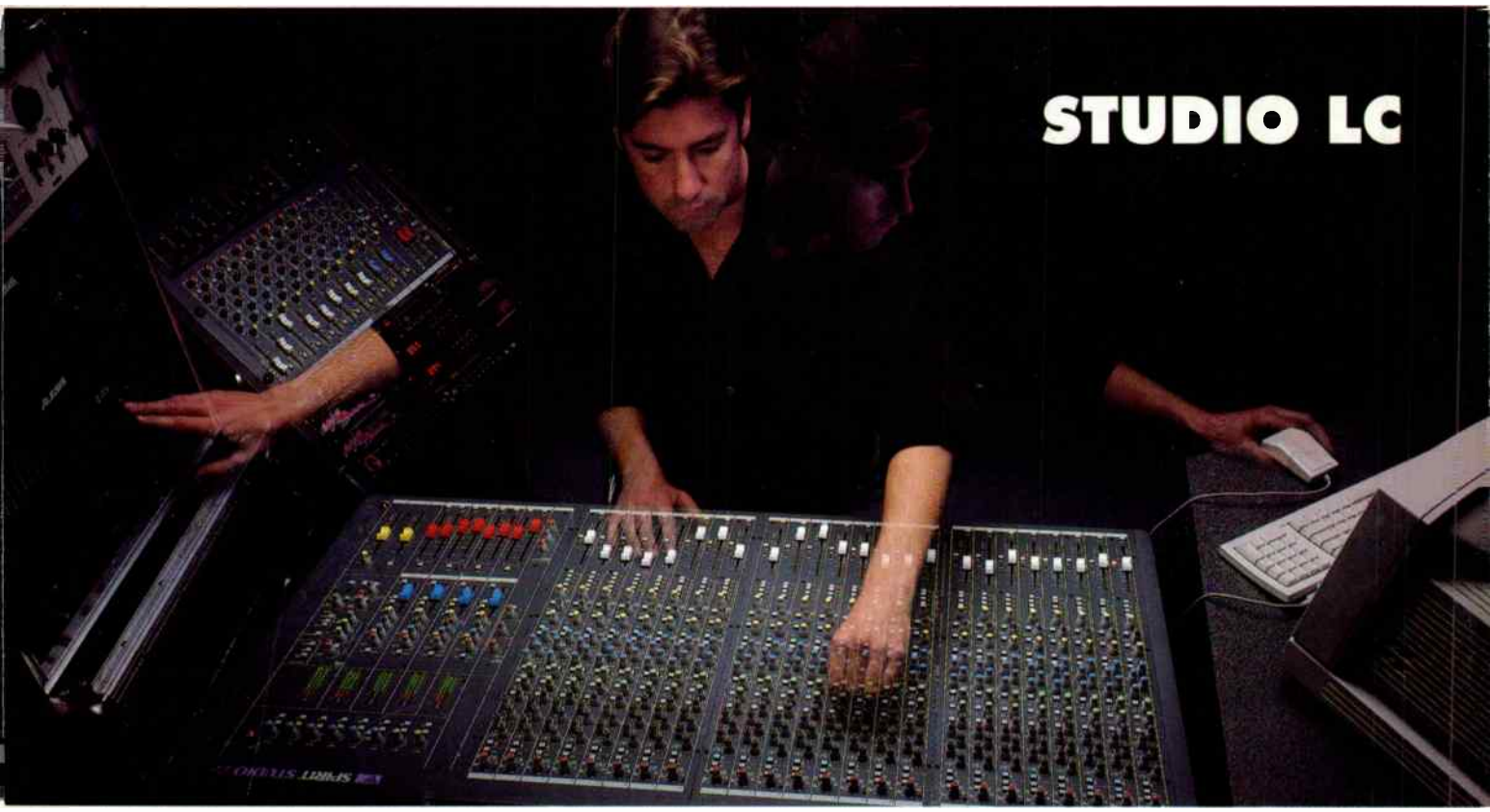

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