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**THE PROJECT
RECORDING
& SOUND
MAGAZINE**

DECEMBER 1994



**EQ FIRST LOOK:
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Yamaha ProMix 01
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PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 5, ISSUE 10
DECEMBER 1994



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LETTERS TO EQ

COMPUTER QUEST

Re: The debate you initiated between proponents of PC and/or Mac/Power PC (October '94 issue). The only two factors that are required considerations are functionality and cost. And despite these criteria, both platforms still have their advantages and disadvantages.

We use *both* platforms (three Macs and one PC). Why both? In our case, the balance was struck more or less as a matter of timing. About seven years ago, when we first considered implementing computer-based functions in our facility, Mac-based options far outweighed those presented by PCs. Apple retained the market strength to command a reasonable third-party support far greater than that afforded to Amiga, Commodore, and other name brand or nondescript PCs combined. Our choice at that time was clear.

However, from that point in time to just prior to Apple's marketing reorganization, Apple's price-to-capacity ratio began to dim in comparison with the strides being made and offered by competing PC platforms, particularly with the introduction of the Windows operating system. This circumstance, and our need to update our tech base, led us to the decision to integrate a PC into our operations. Since then, there have been many realizations regarding the advantage/disadvantage ratio between the differing systems.

Admittedly, we would have had to almost double our investment to acquire a Macintosh that could only begin to approach the PC's capacities. But, in time we have also found that there was a more than measurable trade-off. The time investment required (not to mention the necessitated learning curve) to make the PC functional for our purposes, both musically and businesswise, is very definitely a disadvantage compared with the Macintosh's ease of operation, configurability, and, most important, availability of third-party options.

It must be understood that in our operation, speed is as high a priority as sonic quality. Therefore, since the PC can at times be a configuration nightmare that tends to slow our product turnaround, our Macs end up getting the bulk of the work. What's interesting is that, even though the PC is a 486 running at 50 MHz and none of

our Macs operate over the 33 MHz mark, the Macs still provide a formidable savings in both time and brain cells! This is all due to the triad of qualities mentioned previously, namely ease of operation, configurability, and availability of third-party options.

Now, please don't get me wrong. When it comes to making a decision about which platform is most advantageous when outfitting one's facility with a computer, the bottom line (sans price point) is familiarity. If one is well versed in the nomenclature of PC, the decision is clear. The same applies to those acclimated to the world according to Apple.

On the other hand, for those less acclimated to either the Mac or PC platforms, first-hand knowledge is essential to making a truly informed decision. The opinions of others are worth no more than the air through which they are transmitted. Concerned parties should seek direct access to *both* systems (with the associated peripherals and software desired) and utilize them for whatever purposes are required. They will then be armed with direct knowledge as to which platform best suits the needs at hand.

Then again, don't quote me on that.

*Art Johnson III, Manager/MIDI@t
The Power House Recording Studio
Memphis, TN
Via America Online*

YOU WIN SOME...

Craig Anderton is one of a kind. He has an uncanny ability to shed light on the technological world of the modern musician. It would be impossible to sum up all that he has given our industry over the years. As rare as it is for a technical writer to appear on a magazine cover, Craig Anderton has earned that kind of recognition.

*Rick Aster
Phoenixville, PA*

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...YOU LOSE SOME

Please understand that we are confused as to why such a wonderful publication such as *EQ* would want to have a cover sporting the mug of a MIDlot who recommends the Macintosh LC computer to his followers. Wow.

EQ is really lowering its viewed perception in the high-end pro-audio community. Try to focus on hip, '90s forward thinkers, movers, and shakers.

Jet Set 21st Century
Gainesville, VA

WART BUSTER

I read with great interest the article "All Wall Warts Must Die" in the September '94 issue. Calix Lewis Reneau was right on the mark regarding the genesis of the wall wart, its functions, and its maladies. However, I must correct your statement that they are "...a fact of life — like it or not."

Our Juice Goose Twelve Paq is a rack-mountable, multivoltage system that will provide 9 V AC, 18 V AC, 9 V DC, and 12 V DC without the use of wall warts. With the Twelve Paq, spe-

cial cables are used to plug into any one of the six Microport outlets on the back of the unit. Any one of the outlets will provide any one of the stated voltages. The Twelve Paq transformer isolates incoming power and produces significantly less EM field than a comparable volume of "warts."

Peter Cook
Vice President, Juice Goose
Houston, TX

MORE WART NEWS

Your September *EQ* issue article on wall warts failed to mention what, in my opinion, is the most stupendous news in all of wartdom, namely, Sony's current design for the barrel connectors used on Sony wall warts.

The familiar common (non-Sony) barrel connectors tend to eventually wear in the circumference of the inner-barrel opening. The jacks that barrel plugs insert into also wear over time, and the net result is an increased chance of intermittent contact loss (i.e., of equipment's losing power) if a piece of gear or a wall wart cord is bumped or moved. This can wreak

havoc with digital devices that use memory chips (Alesis drum machine owners take note), which generally don't like split-second power losses. If one occurs during a memory-save operation, forget your data (the chips certainly will).

Apparently driven by the advent of the portable CD player, Sony has come up with a barrel connector that uses a spring-loaded forked contact instead of an inner barrel. The fork actually *grabs* the center contact of a standard barrel jack, virtually eliminating the above problems with the old-style plugs.

This is such an improvement over the previous connectors that if you have to deal with these accursed things a lot (as I do), it is worth it to either replace your warts with compatible Sony warts, or cut off the Sony connectors and splice them onto your more exotic warts (be sure to observe polarity).

One last thing: There are several sizes of barrel connectors — anyone wishing to adapt to the Sony plugs should make certain that sizes are compatible before cutting into any wires.

Tim Fluharty
Torrance, CA

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Bean, from D'Cückoo, whose new "Umoja" CD is on RGB Records.

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EQQA

TIME IS ON MY SIDE

Q What is PRO R timecode and how does it differ from SMPTE timecode? Also, what is A Time?

Rupert Gutkowski
Buffalo, NY

A Prepare yourself to enter a new reality! PRO R means PROFESSIONAL Running timecode, and it has become the worldwide standard for recording timecode onto R DAT. The actual implementation of PRO R was a very clever engineering response to a big technological challenge, as it was designed after the R DAT format was developed. The actual SMPTE address is recorded onto the R DAT tape and is mathematically referenced to a DAT's drum rotation of 33.33 revolutions per second.

When a tape is played back, it is again referenced to the drum's rotational speed — but here's where the interesting stuff occurs: because of this mathematical relationship between the drum and the different frame rates (fr/sec) and types (non-drop and drop frame), the machine is now capable of providing frame rates and types different from those originally recorded, without causing a pitch change. Timecode addresses from tape are first put through the machine's internal timecode generator before they leave the rear panel. The timecode generator provides a "gearbox" function that is impossible with analog tape machines, because, with an analog machine, the frame rate of its SMPTE timecode is physically tied to the linear speed of the tape.

The Otari DTR-90T, for example, can produce all standard frame rates and types from any DAT tape, regardless of what rate and type were originally recorded onto it. This can be very useful, for instance, when exchanging tapes from different parts of the world. SMPTE, EBU, and film code can now "exist" on the same tape. Of course, there will be a learning curve with all

this new flexibility. There are other interesting aspects of PRO R timecode, but I hope I have answered your main question.

The answer to your second question is slightly less involved. A Time means Absolute Time and is automatically recorded on most R DAT machines, even those that have PRO R timecode capability. A Time is defined as the running length of a DAT tape, starting at 0 hours and incrementing until the end of the tape. Since A Time cannot be altered after the fact, it can only be recorded during formatting (assemble record mode) and the starting address at the beginning of the tape will always be 00H:00M:00S:00F. A Time is located in the subcode region, and, contrary to popular belief, A Time and PRO R time occupy mutually exclusive areas in subcode. For example, the Otari DTR-90T DAT machine has the ability to output A Time or PRO R time from its rear panel timecode output, which is determined by user selection. This can be handy when working from tapes made on machines lacking PRO R capabilities. Timecode can even be post-stripped onto these tapes without affecting any other subcode data.

For those of you who actually like to do math and are interested in more theory behind PRO R timecode as well as in other DAT information, I highly recommend John Watkinson's book *RDAT*. [For information or to order, call OpAmp Technical Books at 1-800-468-4322 — H.G.L.]

Tom DeFiglio
Senior Digital Product Specialist
Otari Corp.

DECEIVING LOOKS

Q Yamaha's new ProMix 01 mixer looks different. For example, I don't see any EQ controls. How do you EQ with ProMix?

Ellen Gustaterro
Redding, PA

A At first glance, the ProMix 01 does look different. Yamaha feels the ProMix is designed for a new, efficient work style. Equalizing, panning, and other operations are as fast or faster than on a traditional-style mixer because everything you need is in

immediate view and right at your fingertips. Your eyes and hands do not need to search the console to view and adjust settings.

ProMix includes EQ on every channel and the stereo bus. The EQ is 3-band fully parametric, with variable Q, frequency, gain, and On/Off parameters. Initially the EQ is configured as a conventional 3-band EQ with shelving-type low and high and peaking-type mid (high and low can be configured as peaking types). EQ can be applied to the input channels, stereo input channel, RTN 1, RTN 2, and the stereo output. Stereo-pair input channels are controlled together.

Equalizing is easy. When you press the High, Mid, or Low EQ key, you see the EQ "at a glance" display, which not only shows all EQ settings, but also a graphic picture of the EQ curve for the selected channel. Adjustments can then quickly be made using ProMix's data wheel. While your left hand selects EQ band, frequency, gain, and Q, your right hand makes the changes using the data wheel. Customer response to this operating style has been very positive, with comments that the ProMix is easily understood and fun to operate. [For more information on the Yamaha ProMix 01 and a picture of the unit's EQ display, see Roger Nichols's review on page 86. —Ed.]

Peter Chaikin
Product Manager
Yamaha Professional Audio

JACK OF ALL TRADES

Q I'm building a replica of the Fuzz Face and wonder if it's possible to use a standard input jack instead of the hard-to-find switching-type jack used in the original. Also, do you know of any kits for a direct box for bass?

Tug Madick
Seattle, WA

A You can use a regular stereo input jack instead of the special switching jack used in the original Fuzz Face. The tip goes to the bypass switch, the ring connection goes to the battery + terminal, and the ground terminal connects to the other ground terminals. When you plug a standard mono

If there was a rule about how to get ahead in this business, it would say something about using the right tools for the job.

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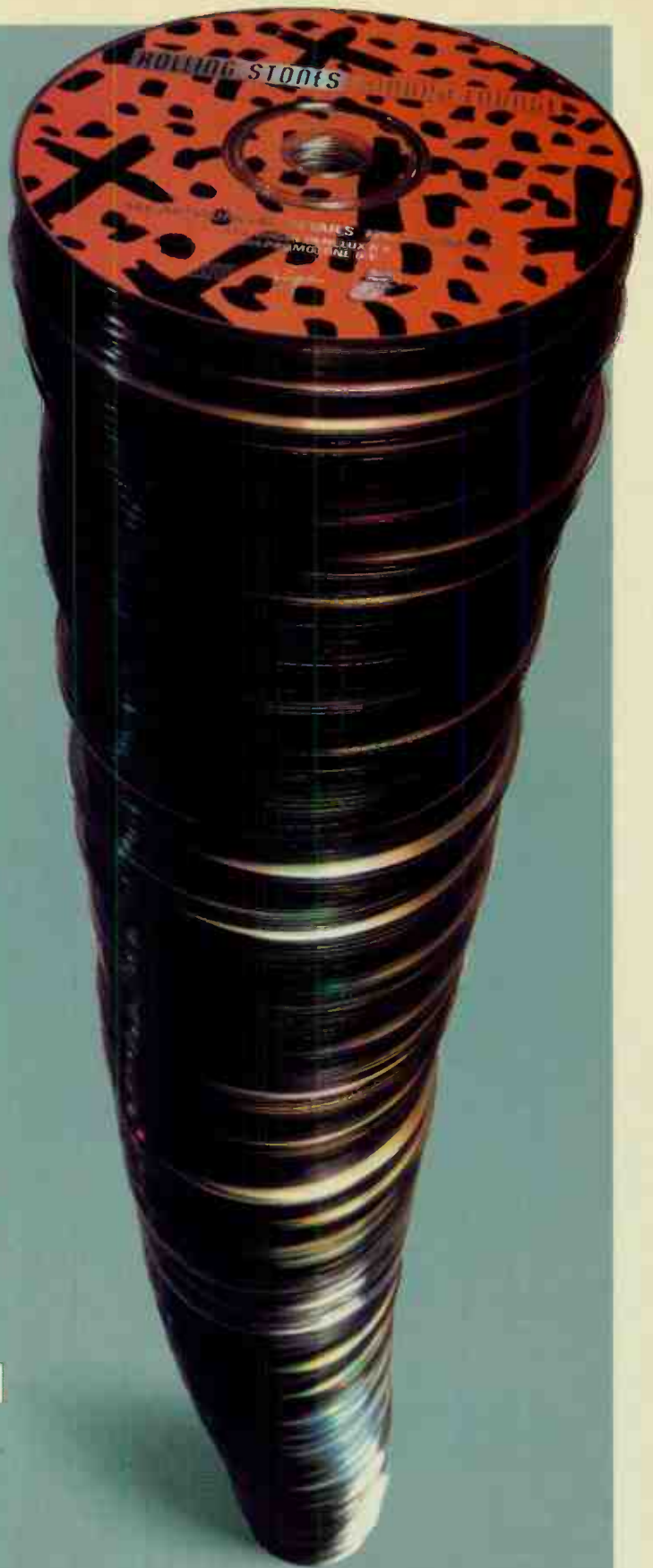
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cord into the input, the jack ring connection contacts the plug's ground and turns on the battery. For the longest battery life, make sure to unplug from the input when not using the fuzz.

Regarding a direct box, check out the "Direct Interface" do-it-yourself article I wrote for the June 1991 *EQ*. It's optimized for electric guitar, bass, and Stick, and is available in kit form for \$39.95 from PAIA Electronics, 3200

Teakwood Lane, Edmond, OK 73013. Tel. 405-340 6300.

Craig Anderton
Technology Editor
EQ Magazine

TOO MUCH NOISE

Q *I have a noise problem whenever I use my strat-type guitar while running a software-based sequencing program. The noise is generated by my*

video monitor, which is close to my recording gear. Regardless of how I record — direct, via mic — I get ungodly noise from my speaker monitors. Moving around eliminates some noise, but who wants to be a contortionist while they play? Any clues?

J.R. Hunter
Cape Coral, FL

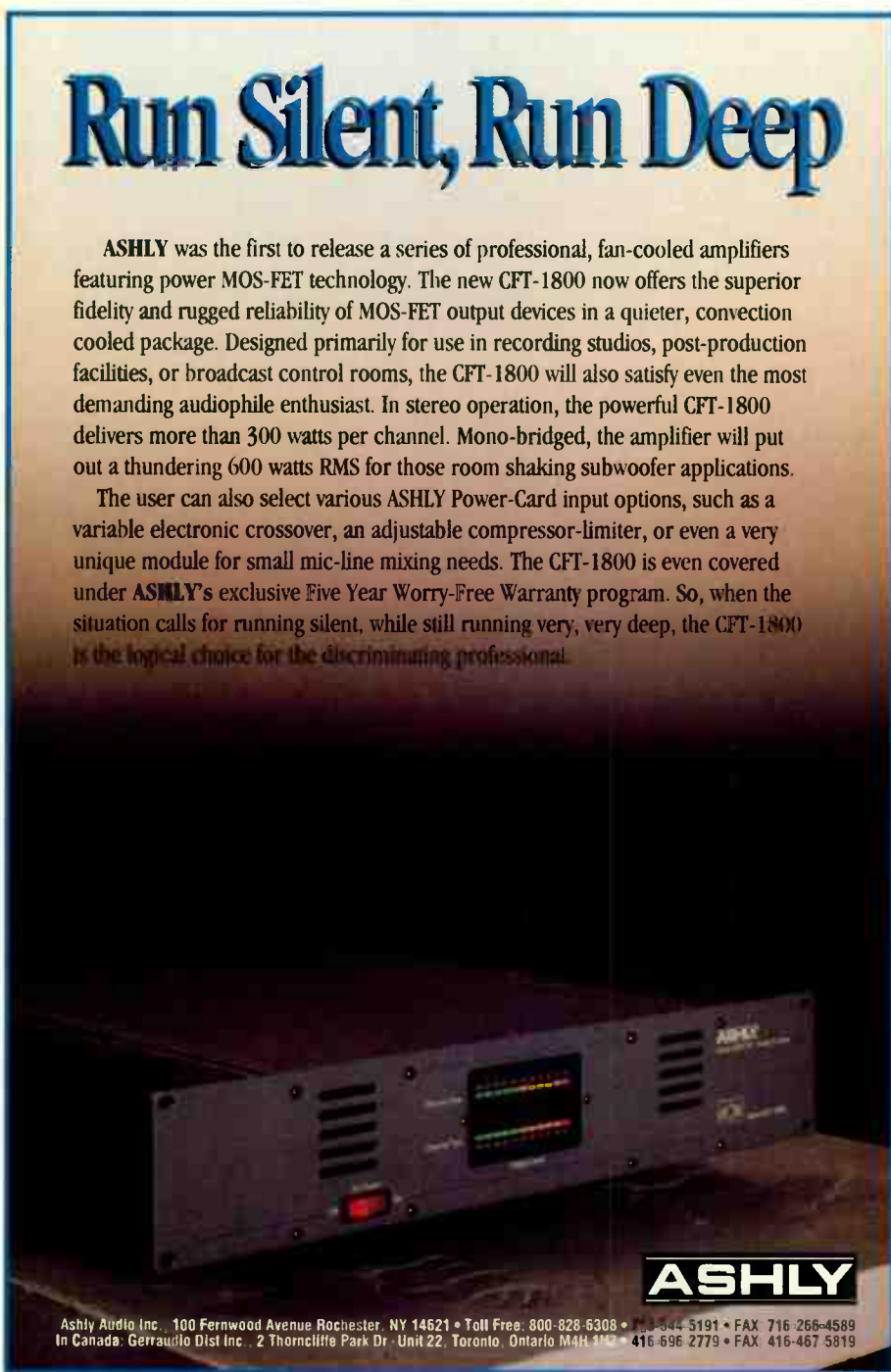
A Computer monitors radiate signals that your guitar can pick up (but you already knew that). Single coil pickups are particularly susceptible; humbuckers work a little better. Getting rid of this interference isn't easy; however, some video monitors are better shielded than others. Black & white types seem to cause less interference than color types, as do the LCD screens on notebook computers. Generally, your only real ally is the "inverse square law," since interference drops away logarithmically as you move further away from the monitor. Try rearranging your recording space so that your computer is as far as possible from your recording electronics. Don't use the same set of speakers for computer work that you use for recording music. Check out the updated, better-shielded, affordable speakers designed for computer work, and allow your music monitors to do what they were designed to do. It's easier to rearrange equipment once or twice than to rearrange your body every day.

Craig Anderton
Technology Editor
Hector La Torre
Executive Director
EQ Magazine

Run Silent, Run Deep

ASHLY was the first to release a series of professional, fan-cooled amplifiers featuring power MOS-FET technology. The new CFT-1800 now offers the superior fidelity and rugged reliability of MOS-FET output devices in a quieter, convection cooled package. Designed primarily for use in recording studios, post-production facilities, or broadcast control rooms, the CFT-1800 will also satisfy even the most demanding audiophile enthusiast. In stereo operation, the powerful CFT-1800 delivers more than 300 watts per channel. Mono-bridged, the amplifier will put out a thundering 600 watts RMS for those room shaking subwoofer applications.

The user can also select various ASHLY Power-Card input options, such as a variable electronic crossover, an adjustable compressor-limiter, or even a very unique module for small mic-line mixing needs. The CFT-1800 is even covered under ASHLY's exclusive Five Year Worry-Free Warranty program. So, when the situation calls for running silent, while still running very, very deep, the CFT-1800 is the logical choice for the discriminating professional.



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You can also E-mail your questions to us at
MPANDA@AOL.COM

**"ONCE YOU'VE REACHED THIS STAGE,
YOU'D BETTER HAVE YOUR ACT TOGETHER."**

After more than 20 years of touring with **Pink Floyd**,
monitor engineer **Seth Goldman** has some firm opinions about music and microphones.

"Pink Floyd's live performances are complex,
both technically and artistically," says Seth. "There's just no margin for error.

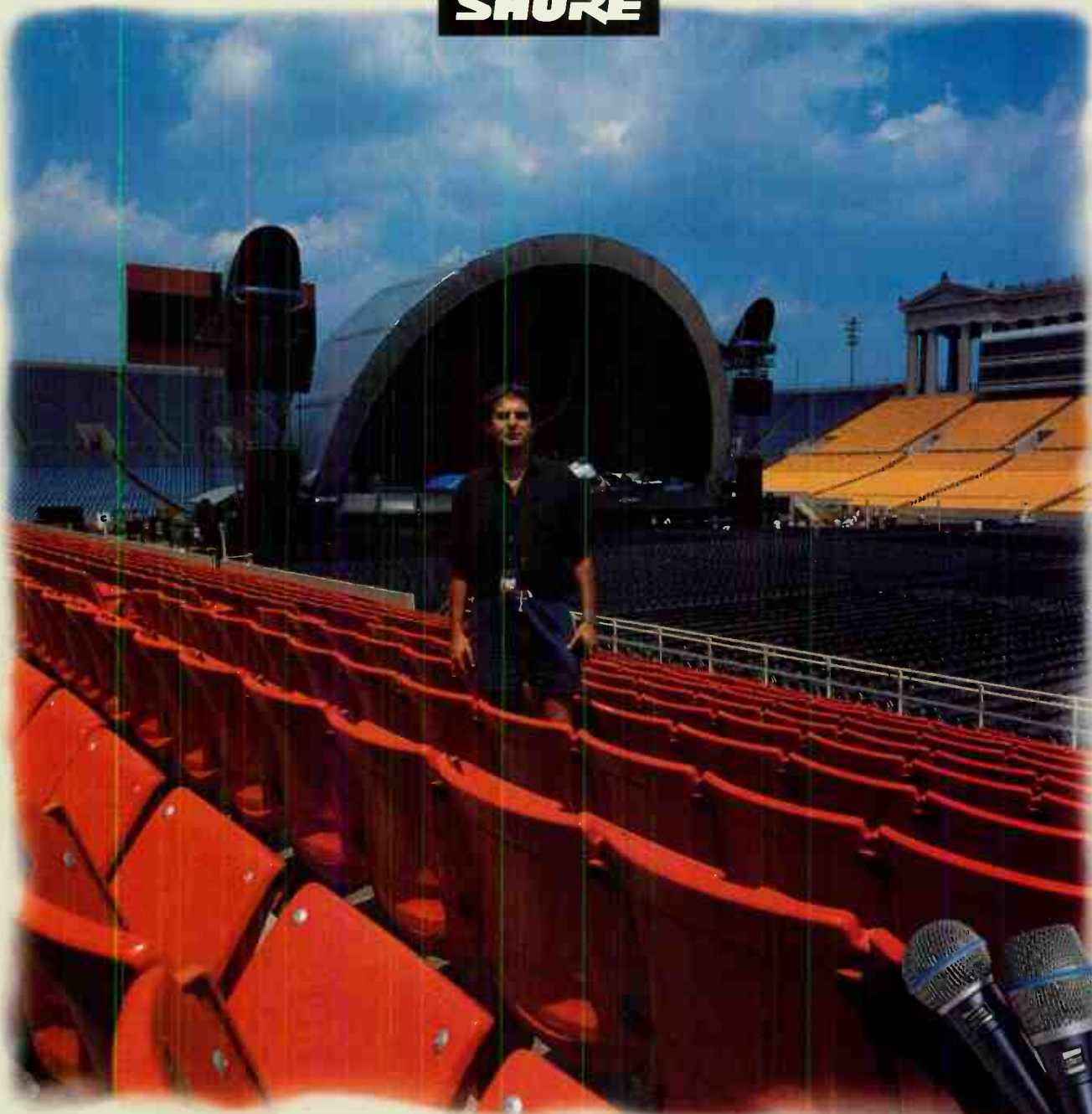
For this tour, I'm using 48 Shure microphones on stage, including eight Beta 87s for vocals.
Their extended highs are outstanding. So is the gain before feedback. And reliability is a given.

I have full faith in every one. They've earned it."

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Seth Goldman, Pink Floyd Monitor Engineer, Soldier Field, Chicago.

CIRCLE 86 ON FREE INFO CARD

www.radiohistory.com

Man of Manhattan

STUDIO NAME: Music Makers, Inc.

LOCATION: New York, NY

MAIN MEN: Mitch Leigh, owner; M. Hans Liebert, engineer; Neil Warner, creative director

CREDITS: Leigh is the composer of the classic Broadway show *Man of La Mancha*

CONSOLE: Soundcraft Sapphyre 36-input with Uptown automation

KEYBOARDS: Ensoniq TS-10; Yamaha G1 grand piano

MIDI: E-mu Ultra-Proteus; Korg Wavestation SR; Opcode Studio 5; Roland IB-1 DM-80 MIDI interface and JD-990 MIDI module

SAMPLERS: Roland S-760

MONITORS: Quedest H-208; Reference 3A

AMPLIFIERS: Bryston 3B and 4B; Hafler Pro2400

COMPUTERS: Apple Macintosh Quadra 840AV; Hewlett Packard Vectra 486/25vi

SOFTWARE: Mark of the Unicorn Performer 5.02; Mark of the Unicorn Unisyn; Coda Finale

DATA STORAGE: Alphatronix Inspire 1.2 GB magneto-optical drives; Dynatech RM-MD512QR-MX 2.4 GB hard drive and RM-MD1055R-MC 105 MB removable hard drive

RECORDERS: Otari MX5050 1/4-inch analog recorder; Roland DM-80-8 with fader unit, remotes, and Multitrack Manager Software; Tascam 122MKIII cassette deck

DAT MACHINES: Sony PCM-7030

OUTBOARD GEAR: Eventide DSP4000; Focusrite Red 1 mic preamp and Red 3 compressor/limiter; Lexicon 300 and 480L effects processors; Sony DPS-D7 digital delay; TimeLine MicroLynx synchronizer; Tube Tech PE 1C single-channel program EQ

MICROPHONES: AKG C414 TLII; Audio-

Technica 4033; Neumann TLM-170; Sennheiser MD 422-U; Shure Beta SM57

MISCELLANEOUS: Roland R8mkII drum machine; Sony SVO-9600 S-VHS VCR and VP-5000 3/4-inch VTR

STUDIO NOTES: M. Hans Liebert remarks: How many studios in midtown Manhattan have windows? Not many. Ours, which was designed by Walters-Storyk Design Group, has two large windows that we feel enhance the quality of our recordings. The inclusion of these windows adds a natural brightness, particularly to our Yamaha G1 grand piano.

EQUIPMENT NOTES: Liebert states: I still take advantage of sys ex. I like having the ability to recall all setups and patches with the push of a button on my sequencer.

EQ



Photo by Julian Jaime

MAN OF LA MANCHA COMPOSER MITCH LEIGH PROVES THAT OWNING YOUR OWN STUDIO IS MORE THAN AN IMPOSSIBLE DREAM

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Output, Adjustable Input
Sensitivity

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LIMPET

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High Current,
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■ Every once in a while a product comes along which not only meets the ever increasing demands of the market, but one whose smooth commercial styling, ergonomics, durability and outstanding performance demands respect. Introducing MR. LIMPET. ■ The LIMPET is a unique, compact design that combines a very high current toroidal power supply, fully discrete amplification stages, and ultra wide (10 Hz to 80 kHz) bandwidth capabilities in a very affordable system.

■ Built using a one piece high pressure die-cast metal housing, the LIMPET is not only very rugged electrically and mechanically, its internal construction takes advantage of the industry's most advanced assembly techniques. ■ The LIMPET amplification system can be used with a wide range of TANNOY professional reference monitor systems, and provides the user with a number of improvements in both the performance of the loudspeaker system, and its flexibility. ■ Each single channel LIMPET system delivers an enhanced stereo image because the channels are fully separated - no power supply sagging due to inter-channel coupling, no crosstalk, no interference. Almost any kind of input level and connector can be used, since the LIMPET offers a balanced or unbalanced "combi" connector that can utilize either 1/4" or 3 pin jacks. ■ The ultra-low noise input section

can accommodate either 0.775, 1.0, or 1.5 volt drive levels with no performance sacrifice. ■ The LIMPET's universal power supply, equipped with an industry standard IEC connector easily deals with almost any voltage, making the LIMPET a true global traveler. Finally, you can take your monitors wherever your work takes you, and not have to worry about cumbersome and troublesome adaptors, power converters, or strange electrical systems. ■ In addition, the unique and proprietary soft-clip circuitry and the significant reserves in the power supply ensure that no damage will occur to the drive units while providing the headroom needed for even the most demanding requirements. ■ The LIMPET is ideal for professional recording, broadcast/post production facilities, remote and live recording reinforcement applications, and finally gives the private/home recording studio truly reference quality performance unequalled at twice the price.

■ Instead of settling for the ordinary, get a LIMPET and get a real grip on your reference monitor performance.



Neumann KM 184

A new microphone that
takes its cue from
days gone by

MICROPHONE NAME: Neumann KM 184

PRICE: \$599

TYPE OF MIC: Condenser

POLAR PATTERN: Cardioid

FREQUENCY RESPONSE: 20 Hz–20 kHz

SENSITIVITY: 15 mV/Pa

RATED SOURCE IMPEDANCE: 50 ohms

SIGNAL TO NOISE RATIO: CCIR weighted: 69 dB; A-weighted: 78 dB, re: 1 Pa @ 1 kHz

DYNAMIC RANGE: 122 dB

MAXIMUM INPUT SPL: 138 dB for a THD of less than 0.5%

POWER REQUIREMENTS: 48 volts, ± 4 volts

DIMENSIONS: 107 mm long, 22 mm body diameter

MIC NOTES: Fans of the discontinued Neumann KM 84 will be happy to know that the KM 184 employs the same cardioid capsule as used in its predecessor. The small-diaphragm KM 184 also features the transformerless FET circuitry used in Neumann's popular TLM 170 and KM 100 series. The KM 184 is essentially a cardioid-only version of the KM 140 (the KM 140 has capsules that can be interchanged by the user to obtain varying polar pickup patterns). The KM 184's ability to handle high sound-pressure level negates the need for a pad switch and makes the mic suitable for use on percussion and brass instruments. Because the mic has a very low self-noise specification, it excels at capturing acoustic guitar and orchestral instruments.


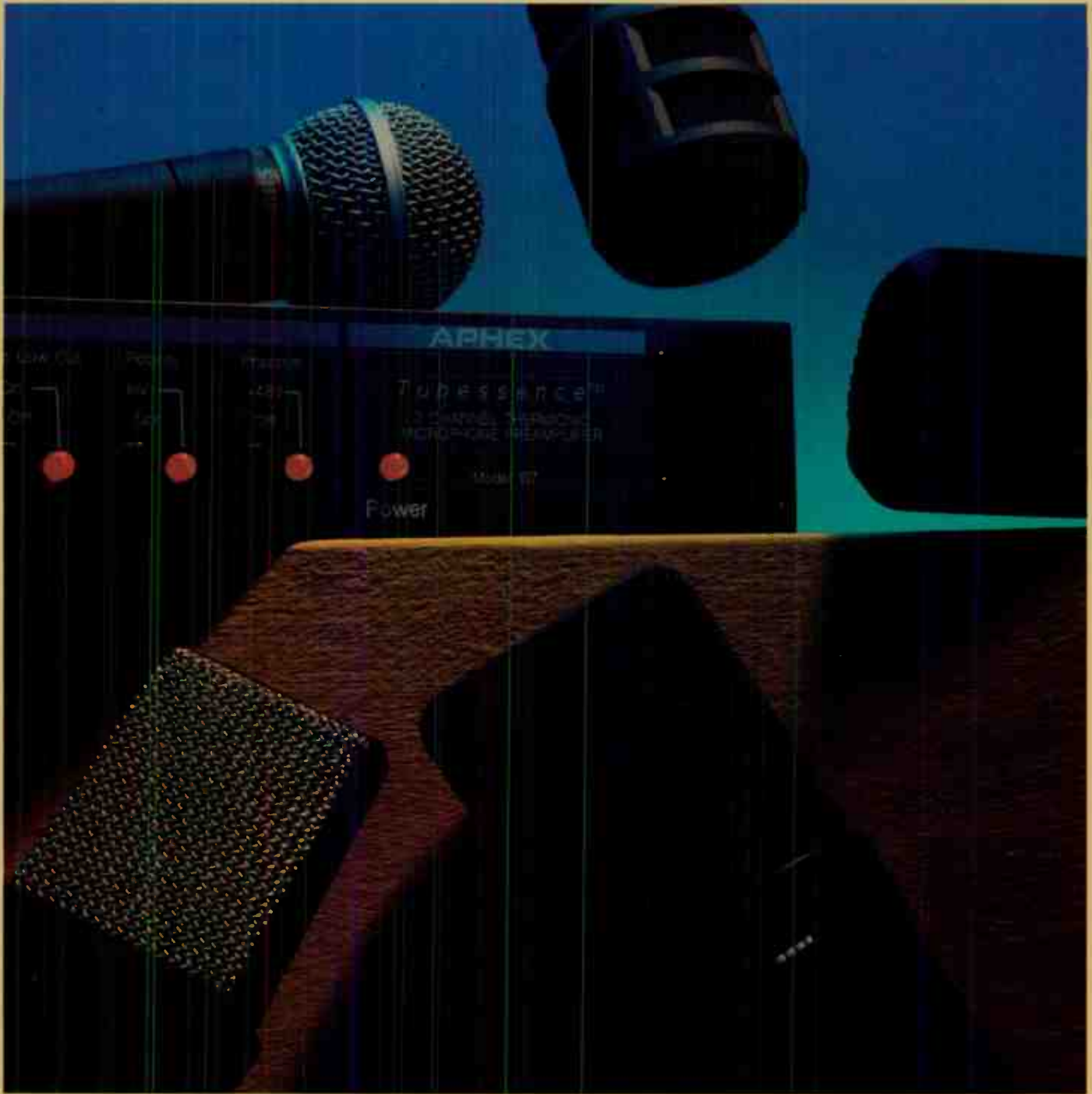
USER TIPS: A single KM 184 makes a great-sounding choice for miking a high-hat. Try pointing the mic at the top cymbal, 3 to 6 inches away, about 45 degrees off axis. To reduce the possibility of leakage from the rest of the drum kit entering the mic, face the front of the microphone away from the drum set, so that the rear of the mic body points toward the snare drum. This will put the snare drum at the null point of the cardioid pattern and improve rejection of the snare drum into the mic. 



Photo by Ed Colver

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94 DB
S/N RATIO

When it comes to sound, not even compact discs are as clean as the TSR-24S. Our Silencer™ digital noise gate wipes out noise by writing digital zeros when there's no signal present.

94 dB

SPECIAL EFFECTS

OVER 75 EFFECTS

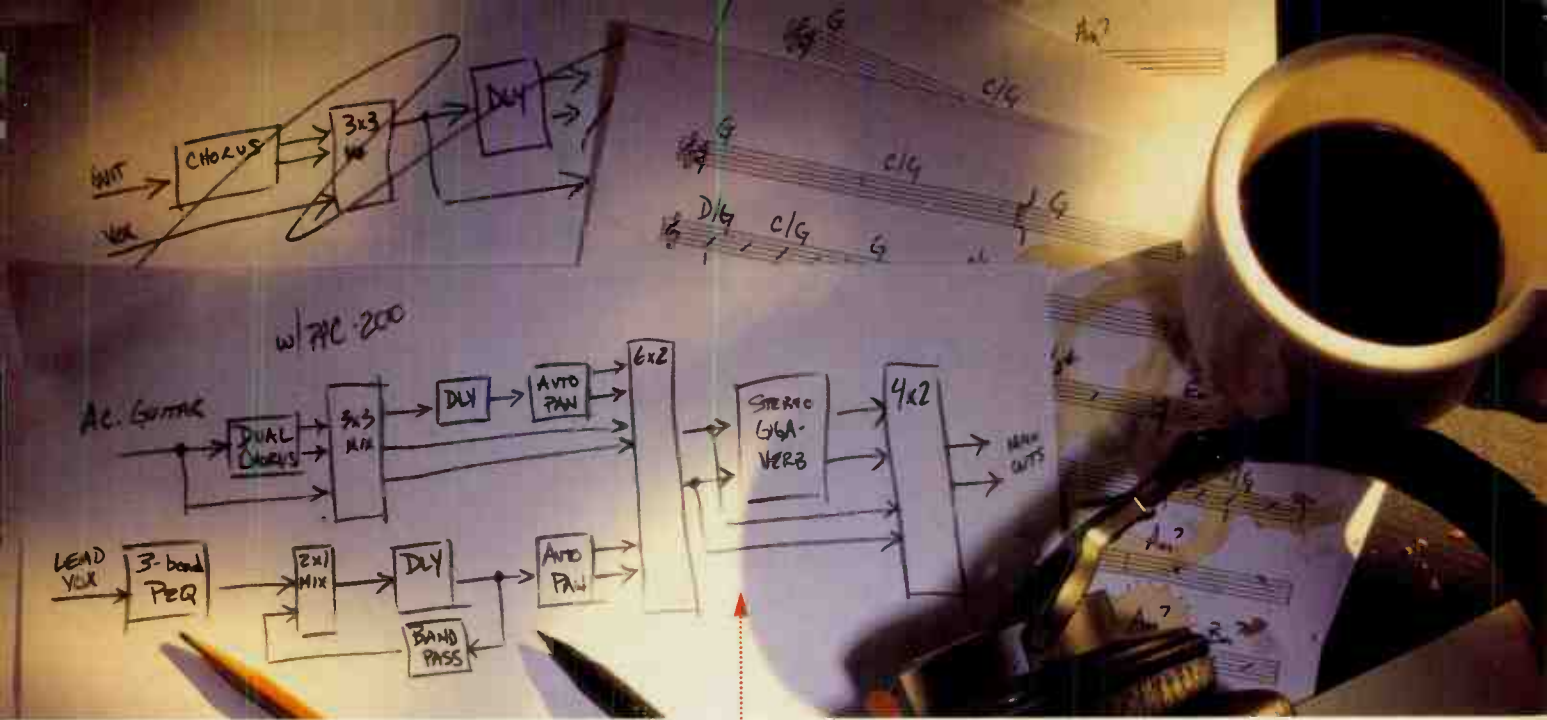
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Either

Primary Reverb

Quadraverb

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- Francis Buckley, Independent Engineer: Album, Film and Television

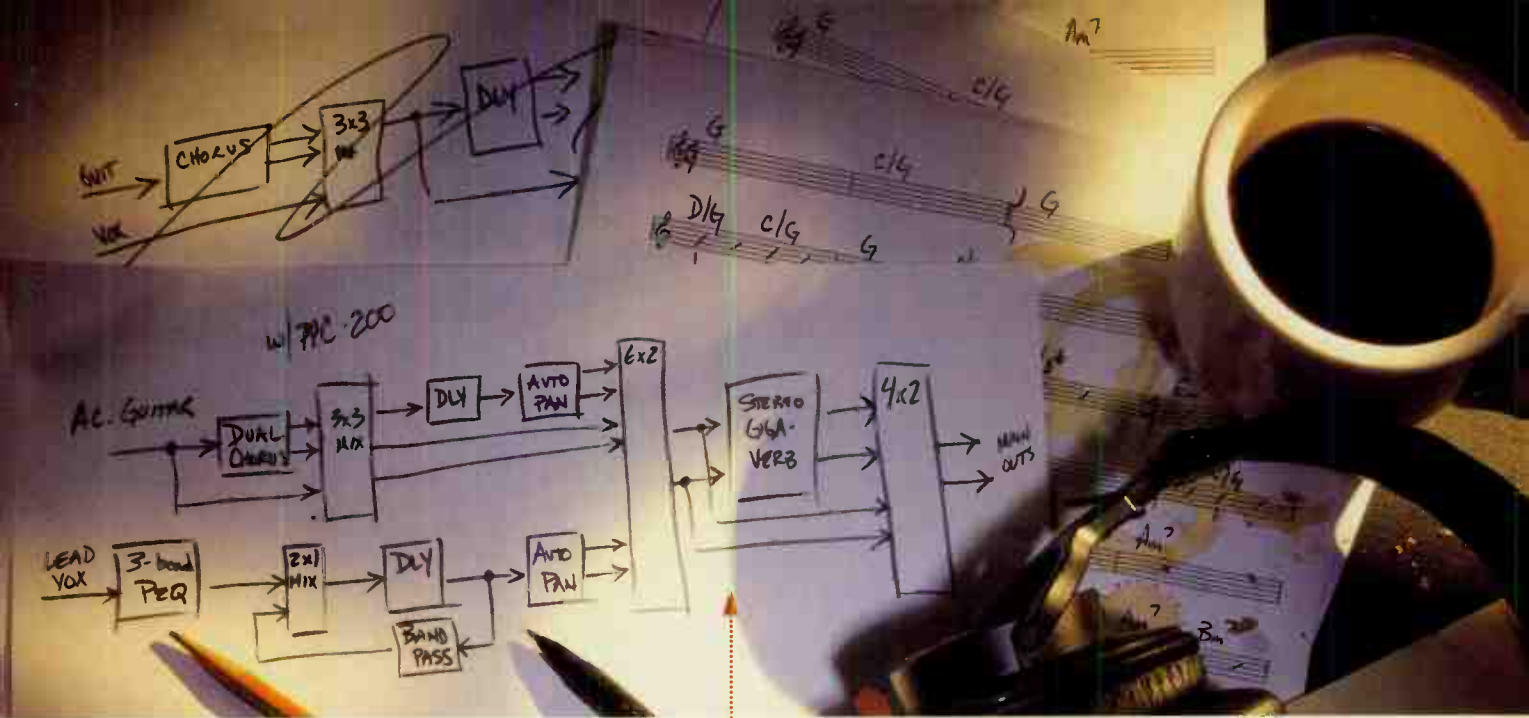
"It's nice to see a company interested in the user's input before they release a product. They developed a reverb that really works. It's easy to make these kind of programs run if you've got tons of hardware. How they did it with such a small box at such an affordable cost is really impressive. It was worth the wait."

- Charlie Brewer, Chief Engineer, Village Recorders

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Your primary reverb is always the first reverb on the echo buss. The best reverb in the studio. Until now, reverb this good used up most of





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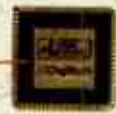


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CIRCLE 35 ON FREE INFO CARD

Getting Soundgarden's Sound

EQ talks to engineer Jason Corsaro about the recording of *Superunknown*, Soundgarden's hit album

BY STEVE LA CERRA

EQ: The vocal sound on this album, particularly on the song "Black Hole Sun," is really fat and warm. How did you go about recording the vocals?

Jason Corsaro: All of the vocals were actually recorded in the control room where Chris [Cornell] would monitor using headphones. I would set up the gear, get the signal chain to tape, and basically Chris would take it from there. Usually, Chris would be the only one present in the control room — he was much more at ease singing with no one else around. We tried a lot of combinations of mics, compressors, and equalizers to get Chris the sound that he imagined in his head. Ultimately we used a Klaus Heyne-modified Neumann U47 FET, but the tone of Chris's voice is really coming from within his body. He can get that tone from almost any microphone, but not all mics can handle the high-SPL output from his voice. In fact, he blew a few mics just by singing into them.

The great thing about Chris is that he has a powerful, almost operatic

voice, with a lot of control. He can push hard for quite a long time without blowing out his voice and his tone doesn't really deteriorate until the very end of a session. All of the emotion and richness of tone is provided by Chris himself — not really by anything I did in the studio. It would be almost impossible to screw up his vocal sound.

What techniques and equipment did you and the band use in order to achieve the distorted background vocal that enters toward the end of "Black Hole Sun"?

Corsaro: We used distorted vocal sounds on several of the songs on *Superunknown*. Most of the time we plugged a mic into an old Shure tube PA system and then ran a direct output from the Shure unit into the recording console via direct box. I think that the band either found this thing or someone gave it to them, but in any case it had a very warm, smooth distortion.

Did Chris do a lot of vocal comping?

Some of the vocal tracks were actually one-pass performances, but on others, Chris did some comping.

It sounds like there is a lot of compression happening on the drums in "Black Hole Sun."

Oh absolutely. I am a big fan of high compression ratios and manipulating the low end of a sound with compression. I like to push the low end when recording so that I can get that long sustain on the bottom end. Upon playback, I can always filter out some of the low end while keeping the sustain.

The entire compact disc is a very analog-sounding recording.

Well that was one of our goals — to make a record with the warmth and low end of an old-time record but also with the clarity and punch of a modern recording. We used a lot of Pultec equalizers, UREI 1176 and LA-2A limiters, and old Neve equalizers and mic preamps, but we also used an SSL console to keep it clean and punchy.

I think that Soundgarden is a great band and I feel that they have amazing records yet to come. **EQ**



UNKNOWN NO MORE: The secrets to Soundgarden's *Superunknown* are revealed.

Photo by Kevin Westingberg

AUDITIONS:



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World Radio History

Either

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Quadraverb

ALESIS

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Q2-360

PROST Preset 1 Vocal Reverb
02:00

REVERB
MIX
ON/OFF
PRESET
LEFT
RIGHT
STOP
RECALL

In a world filled with too many confusing options, it's good to know that there's a product built to deliver just two things. The best reverb you've ever heard. The most powerful

"To my ears, if you can get a reverb unit to sound good on the vocals, you can get it to sound good on anything. Because the biggest challenge for any reverb is the lead vocal. I put this reverb up against everything else out there and nothing surpasses it. I use Q2 on the vocals."

- Francis Buckley, Independent Engineer, Album, Film and Television

"It's nice to see a company interested in the user's input before they release a product. They developed a reverb that really works. It's easy to make these kind of programs run if you've got tons of hardware. How they did it with such a small box at such an affordable cost is really impressive. It was worth the wait."

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*- Jay Graydon, 2 Time Grammy Winner,
Engineer, Producer*

We throw in the multieffects so you don't have to make any compromising choices. This is truly the way it should be. Q2™ is at your Alesis Dealer now.

8 simultaneous effects. Dual Processing™ allows any effect in any order Stereo or independent dual-channel operation. TPO preset, 100 user programs, custom LCD graphic user interface with Virtual Patch Cables™, 120dB dynamic range, 20Hz - 20kHz frequency response, 24-bit internal processing, One-Touch Value/Enter Wheel, +4dB balanced (series) outputs and 10dB unbalanced operation on 1/4" TRS, separate L/R input levels, THD+N < 0.005%, 16-bit Delta-Sigma 128x oversampling A/D conversion, 18-bit Delta-Sigma 64x oversampling D/A conversion, 48kHz sampling rate, Rooms, Plates, Chambers, Halls, Non-linear, Decay, Spring, Chorus, Oval Chorus, Flanging, Flusor, Leslie, Pitch Shift, Pitch Detune, Delay, Mono, Stereo, Ping-Pong, Multitap, BPM, Tap Tempo/MIDI Clock, Mono & Ping-Pong Delays, Ring Mod, High/Low/Bandpass, Shelving Filters, 2-Band Sweep-EQ, 3&4-Band Parametric EQ, 5-Band Graphic EQ, Resonator, Tremolo, Stereo Sim, ADAT™ Optical Digital Interface™, Reverb Only Mode, Input Envelope, Peak Following and Ramp Dynamic Response Mode. Tons of MIDI stuff. All trademarks are property of Alesis.



CIRCLE 05 ON FREE INFO CARD

The Art of Total Control, Part Deux



More on the use of MIDI signal processors

BY CRAIG ANDERTON

Last issue, we covered MIDI signal processing theory. This issue, it's time to investigate practical applications.

Sometimes a patch change is too

abrupt to give the desired effect. For example, on one tune I use the same basic program for guitar throughout but change the distortion drive for rhythm and lead parts. This change often occurs over a measure or two, which sounds much better than just having an instant, switched change. During a lead section, sequenced continuous controllers also determine the amount of echo feedback, echo mix, and sustain. All of these changes happen over time (e.g., as the solo progresses, the amount of echo feedback increases), which sounds very natural.

THE AUTOMATED MIXER MODULE

During mixdown, feed a taped vocal (or other instrument) track into an Alesis QuadraVerb or similar multieffects. These devices typically provide chorusing, EQ, reverb, and other effects used on voice. In addition, many parameters, including overall level, can be controlled via MIDI. You can therefore use a sequencer to automate all kinds of interesting vocal effects and mix the vocal while you're at it.

MIDIFYING ACOUSTIC INSTRUMENTS

MIDI-controlled signal processors can add a lot of useful effects to acoustic sessions, but some people have the misconception that sequencing con-

troller messages and program changes requires playing to a click track. This isn't so. If you sync a sequencer to tape and set it to a fairly high tempo (such as 180 beats per minute), you can treat the sequencer as an absolute time device that identifies time elapsed since the beginning of the tune. The sequencer serves not so much as a musical counter, but merely as a way to trigger program changes and spew out MIDI controller data on cue: as long as the sequencer remains synced to tape, program changes and controller messages recorded into the sequencer at a particular time will always play back at that particular time. If the tape speed varies, the sequencer will follow along.

It's generally assumed that having a program change or other message fall "on the beat" requires playing in time with a sequencer. However, a pro-level computer-based sequencer can resolve around 1000 discrete events per second, depending on tempo. Therefore, the sequencer can record a piece of MIDI data about every millisecond, so the most you can be off from the beat will be 0.5 ms —no problema.

Note that you don't need much sequencer power to do this sort of thing. In fact, you can run a spare sequencer, like a small hardware

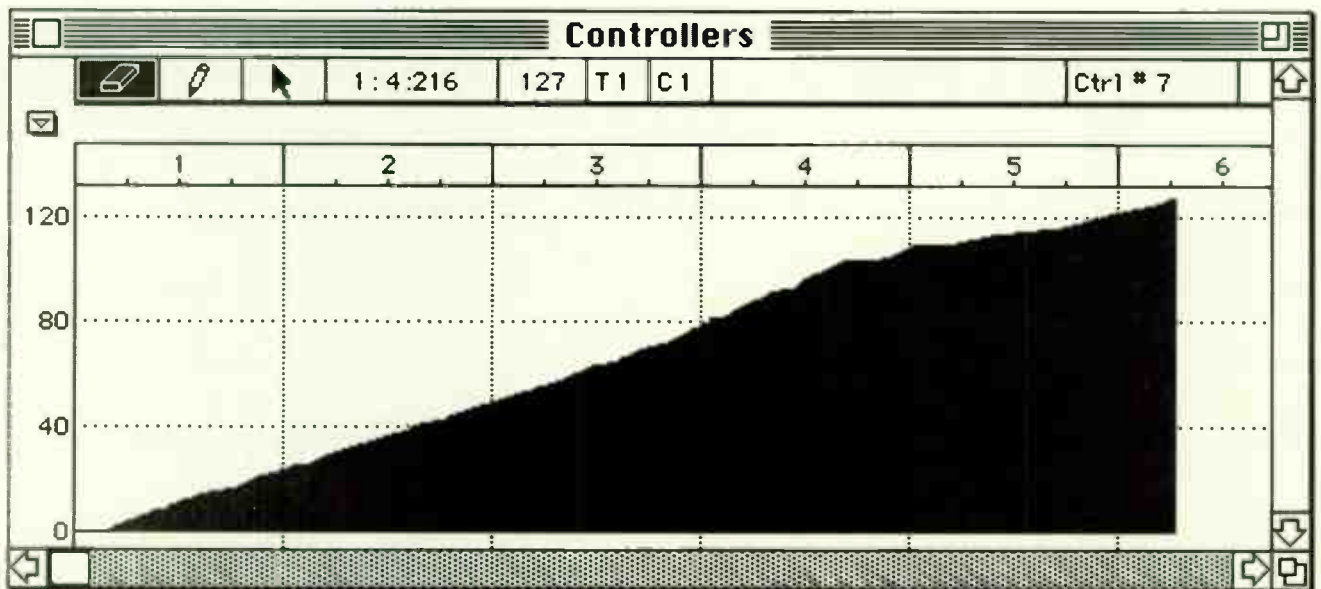


FIGURE 1A

HOW WE TALKED* OUR ENGINEERS INTO BUILDING A FULLY LOADED 16-CHANNEL MIXER YOU CAN REALLY USE FOR LESS THAN 700 BUCKS†.

The MPL 1640 Compact Mixer: Another Idea Several Light Years Ahead of Its Time.



Caught up in a fever of inspiration, we raced downstairs to engineering with a great new idea.

"Let's take our super-popular MPL 2242 rack-mount mixer, cut it down to 16 channels with most of its great features intact and the same amazing sound quality – for about half the retail price. If we get it to market in a few weeks, we'll sell tons!"

Engineering Responds.

"Impossible," they answered. "Even marketing people should know you can't just 'cut down' an existing mixer to come up with a new one. It has to be designed from the ground up. Which takes a great deal of time and serious thought. We might even have to develop new manufacturing techniques to come close

to your target price."

"Details, details," we answered. "You gotta look at the big picture, fellas. We know you're talented enough to pull this off if you really put your minds to it."

Against All Odds... We Did It Again!

When our chief engineer came in six months later with a prototype of the new MPL 1640, we weren't really that surprised. But when we listened to it, we all started rolling around on the floor and barking like dogs.

It was unbelievable! The same incredibly transparent, digital-ready audio as the 2242. With an expanded frequency response of 10Hz to 50kHz and a super-low noise E.I.N. spec of -128 dBu that left every other mixer eating our dust.

And what a looker! A compact, 16 channel, 8 space rack-mount mixer

with 10 XLR inputs. Each channel loaded with *everything* you need: a super-smooth 3-band EQ, Mute and Solo/PFL, 3 Aux Sends, 3 Stereo Returns, Phantom Powering and more, more, more.

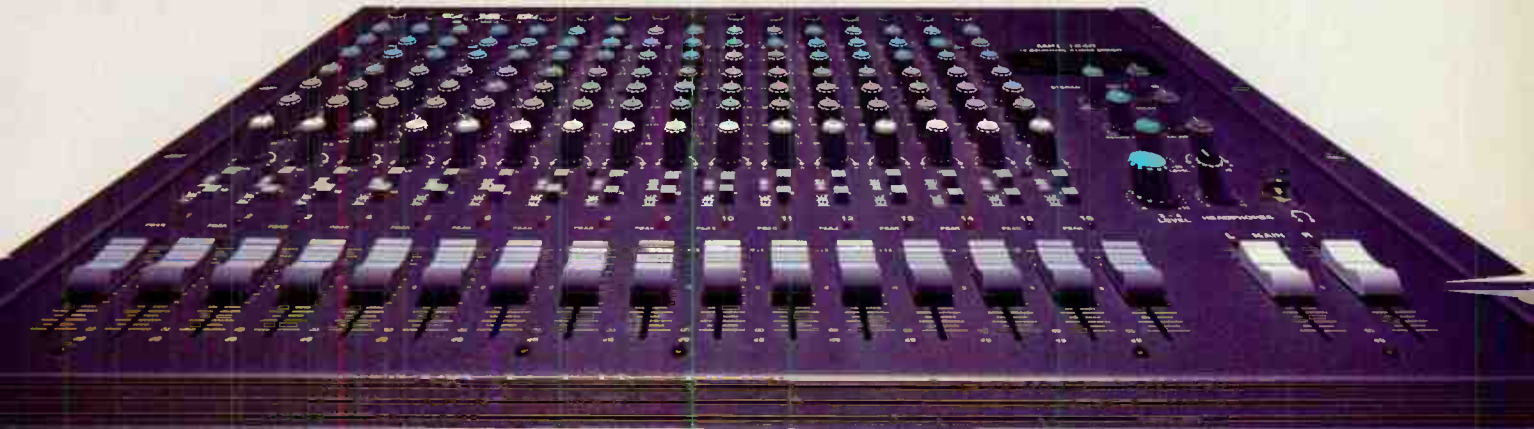
Even subtle stuff like bus inserts to daisy-chain our mixers together for some serious expandability in the future. And a rotating jack-field for maximum flexibility. Better yet, the 1640 came in a tad

under \$700, just like we planned it.



Discover What We Already Know.

Now all *you* have to do is check out the new MPL 1640 mixer at your nearest Samson Audio dealer. You'll find out why audio that sounds great to your ears doesn't have to cost an arm and a leg.



SAMSON AUDIO

CALL (516) 932-3810, FAX (516) 932-3815, or WRITE Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068. Our technical support wizards will be glad to dazzle you with all the specifics about the MPL 1640 Compact Mixer and all of our visionary audio products. *Actually 'tricked' is more like it. †Suggested retail list price, \$699.99. ©1994 SAMSON

CIRCLE 83 ON FREE INFO CARD

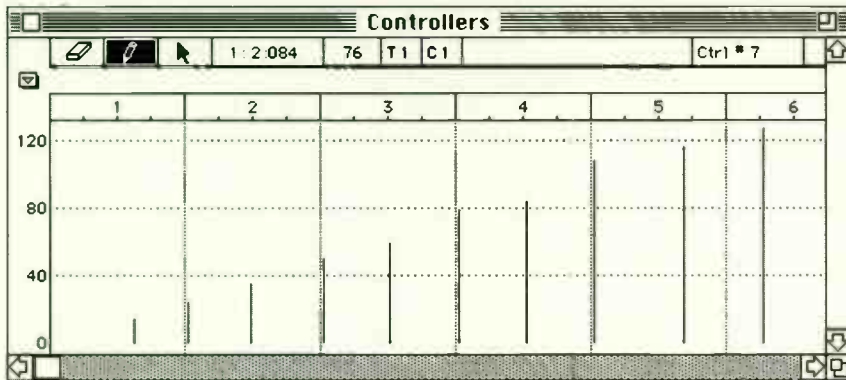


FIGURE 1B

sequencer, just for signal processors that are in sync with your main sequencer. This also increases the number of available MIDI channels.

LIVE PERFORMANCE

If you play to a MIDI sequencer or drum machine and have defined song structures, then controller events and program changes can be recorded as part of a sequence. For guitarists, functions normally triggered by footswitches and pedals are completely automated, freeing you to concentrate on just singing and playing.

MIDI GUITAR FOR SIGNAL PROCESSORS

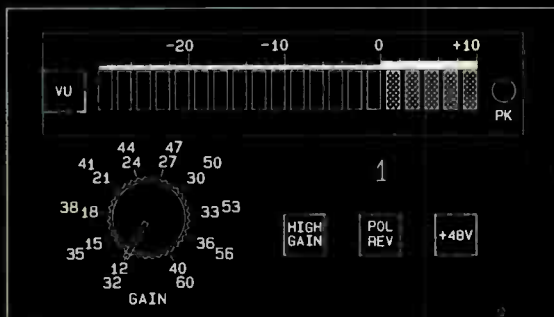
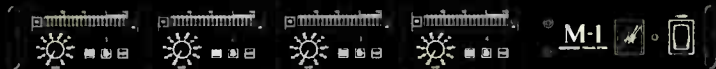
A MIDI guitar that uses pitch-to-MIDI conversion (like the Roland GR-50, Casio PG-380, or Gibson Max) can be played as a standard electric guitar. Normally the MIDI data drives synth modules, but there's no reason why you can't use the MIDI data solely to control processors that affect the straight guitar sound. For example, tie echo feedback to note pitch, so that higher notes have longer echoes (good for solos). Have EQ track the notes being played, or tie chorus depth to velocity so that louder sounds swirl more. Some MIDI guitars offer mechanical "whammy bars" and other physical controllers, giving you access to signal processor parameters at the guitar itself.

For some mixdown applications, the most convenient way to access MIDI parameters will be with footpedals that produce continuous controller data. Several companies, including ART, Lake Butler Sound, and Morley, make suitable MIDI control pedals. In addition, Anatek's Pocket Pedal can convert an existing resistive volume pedal (e.g., Yamaha FC-7, Korg EXP-2, Ensoniq/E-mu keyboard pedal, Roland EV-5, DOD/DigiTech volume pedal, Ibanez VL10, etc.) into a MIDI pedal capable of sending controller messages 1, 5, 7, or pitch bend. (The controller numbers cannot be changed, so you'll have to do any mapping at your processor.) A normally open or closed footswitch plugged into the Pocket Pedal can send switch controllers 64, 65, and 66. Note that the effect's MIDI Out should connect to the Pocket Pedal's MIDI In, since this is how it gets its power.

SEQUENCING CONSIDERATIONS

Programming lots of controller messages into a sequence can drastically

M-1
MICROPHONE PREAMPLIFIER



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DC SERVO and INPUT BIAS CURRENT COMPENSATION
eliminate all coupling capacitors and degradation they cause.

Standard equipment: illuminated push-buttons, shielded toroidal power transformer with 6-position voltage selector switch, silver plated XLRs, ground-lift switches, phantom power, polarity reverse and gain controls. Options include the Jensen JT-11-BM output transformer, VU-1 meter (shown), PK-1 meter, gold plated XLRs.



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—D&R ORION REVIEW, MIX MAGAZINE

If you weren't aware of how popular D&R consoles have become, we understand. After all, we're not very good at making a lot of noise.

As thousands of D&R owners know, however, it takes more than our 20-bit-ready- noise floor to sound good. It takes more than our acclaimed Hi-Def™ EQs, and our RFI-killing, welded-steel chassis and stargrounding designs.

It also takes attention to a spec few console manufacturers are willing to discuss. We're talking phase coherency—which we tackle head-on by meticulously phase correlating each

and every audio stage in every module in every console we craft. The result? Virtually no audible phase shift.

Is all our trouble worth it? Yes. You see, if we settled for "industry standard" phase specs, your music and audio could suffer up to 300% more phase shift. So thanks to our trouble your D&R will deliver sonic ecstasy. Not sonic smear.

Like the magazine said, we're serious. True, maybe we'd have to settle for industry standard performance if we stopped handcrafting consoles, and started assembling them. But we assure you that's another phase we won't be going through.



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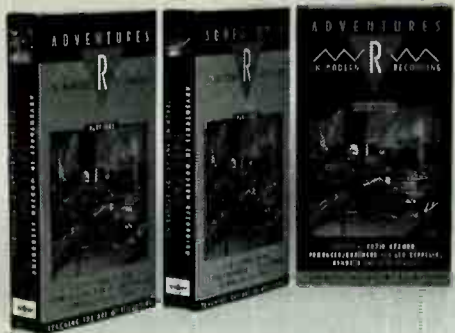
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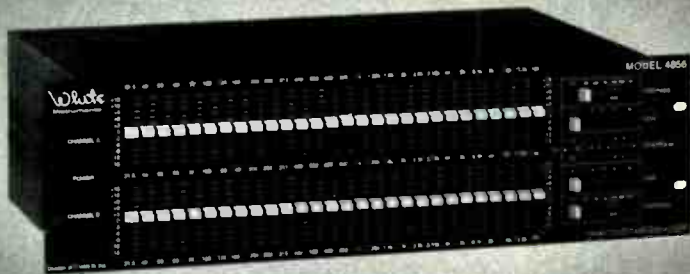


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CIRCLE 181 ON FREE INFO CARD

MI INSIDER

increase the sequence's memory requirements. Moving a mod wheel or pedal sprays out hundreds of events; too many of these can cause timing delays or result in "MIDI clog."

Fortunately, many times you can use a "snapshot" approach and just insert a single controller value at strategic points. The parameter will remain at this value until changed. Fig. 1A shows a continuous controller doing a fade in on the master volume parameter; fig. 1B shows a "snapshot" version of the fade. There is little audible difference between the two, but, clearly, 1B saves a lot more memory than does 1A.

NONCONTINUOUS CONTROLLER MESSAGES

Some signal processors accept messages in addition to continuous controllers such as note pitch, velocity, pressure, and so on. These are applicable to tying a processor's response to a specific note range on a keyboard or to expressiveness added with velocity or pressure controllers.

MIDI also includes timing-related messages for synchronization among rhythmically oriented devices such as drum machines and sequencers; some multieffects delay modules can set their delay time according to these MIDI clock messages.

A MIDI clock message occurs 24 times per quarter note and provides the master metronome signal to which all devices synchronize. Multieffects that sync to MIDI clocks do so by counting the number of clock pulses and adjusting the delay time accordingly. For example, for a quarter-note delay, the multieffects will set its delay time to equal 24 MIDI clock pulses. For a half-note delay, it would count 48 MIDI clock pulses. A sixteenth-note delay would be 12 MIDI clock pulses, and so on.

All of this is pretty "transparent" to the user. Simply plug the MIDI Out from a drum machine, sequencer, or other rhythmically oriented device into the multieffects MIDI In and set the delay time to a specific note value. The multieffects' computer takes care of the rest.

SO START CONTROLLING!

The above tips should get you going. There's a whole world of control out there, so read the manual, hook up a few MIDI cables, and make your own sounds. Signal processors remain an area where, thanks to MIDI control, you can exercise a great deal of creativity.





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AND TRY TO FORGET IT

AND LEARN TO IGNORE

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TURN AWAY AND LET IN AND TRY AND FAIL AND WANT TO BE AND EVOLVE

INTO AND INHALE OR IN SOME PEOPLE'S CASE CLAIM THEY DIDN'T AND DREAM

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Don't Be Afraid...It's Only Me

How Danny Elfman used his project studio to stay twisted in Tinseltown

BY JON VARMAN

Somewhere between the mid-eighties and the present, an interesting thing happened to Danny Elfman: he evolved from being the lead singer of Oingo Boingo (now simply called "Boingo") to being a top-call film composer. Thrust into the scoring spotlight with *Pee Wee's Big Adventure*, Elfman parlayed a promising debut into a string of successes, scoring such films as *Darkman*, *Midnight Run*, and *Dick Tracy*.

But it was during his highly-productive collaboration with director Tim Burton (whom he first worked with on *Pee Wee*) that Elfman was driven to create a larger-than-life pastiche of sounds that rocked the film world. In addition to *Beetlejuice*, *Edward Scissorhands*, and *The Nightmare Before Christmas*, Elfman wrote the score to *Batman* and to its sequel, *Batman Returns*. Add to this the title song for *The Simpsons*, and Elfman has an impressive resume that's difficult to top.

Having conquered the film industry, Elfman has now rejoined his Boingo bandmates for a new album, only this time their lead singer brings with him all the experience of an A-list Hollywood composer. *EQ* recently spoke with Danny Elfman about his movies, music, and insane world:

EQ: During the time you were doing individual songs for movies like *Weird Science*, did you have aspira-

tions to do full scores for film?

Elfman: No, *Weird Science* was the only song I've written for a film. I've had a lot of songs in films, but like most songs in movies, they're ones that were written for something else and then just got dropped in. *Weird Science* was a fluke and that happened the same year as *Pee Wee's Big Adventure*.

When you did the score for *Pee Wee's Big Adventure*, how did you approach it?

Well, that was a whole new thing. *Weird Science* was a fun little song that I wrote in a day and took a couple of days to record. You just go in, you do it and either it does or does not happen. It's not a laborious process, but rather quick and spontaneous. *Pee Wee* was a whole other story. I had to dive in and learn a whole new art.

Did you have access to technology to make your job easier?

Not really, no. The only technological



ELFMAN RETURNS: After scoring big in films, Danny Elfman is back with Boingo (formerly Oingo Boingo).

Photo by Lisa Johnson

November 1994.

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CIRCLE 76 ON FREE INFO CARD

World Radio History

TO MAKE OUR MIXER SOUND JUST LIKE THE COMPETITIONS' WE'D HAVE TO GET RID OF ALL THIS!



INTRODUCING THE

SPIRIT FOLIO RAC PAC

CHANNEL INPUTS

The Spirit Rac Pac offers mic and line inputs on all mono channels with gain adjustments from -50 to +8. Also included are two stereo channels

(4 line level inputs) for single fader control of your stereo keyboards or drum machine.

MID SWEEPABLE EQ

With the Spirit Rac Pac we let you select the frequency points... from 250Hz to 6kHz. Our competitors select your mid frequency points for you.

(We think you're intelligent enough to decide what's best for your music!)

TRUE DIRECT OUTPUTS

The Spirit Rac Pac features individual inserts and true post fade equalized direct outputs. The competition makes you choose one or the other. And, if you choose direct outputs, your signal bypasses the EQ

AUXILIARY LOOPS

The Spirit Rac Pac gives you 6 auxiliary outputs, and the ability to solo all 6, not just the first 4, like other



mixers! Plus, the Rac Pac provides a return for all 6 with stereo returns. That's 12 additional inputs!

4 SUB GROUPS

The Spirit Rac Pac provides 4 discrete sub groups which are assignable to separate left and right stereo outputs. Other mixers require you to sacrifice your channel mute function to achieve 4 sub groups.

EXTERNAL POWER SUPPLY

The Rac Pac provides an external power supply, which eliminates any chance of that annoying 60 cycle hum!

With built-in features like a high-pass "rumble" filter, direct outputs on all mono channels, true sub groups, and a full master section with control room outputs and two track returns, why would you settle for anything but the Spirit Folio Rac Pac?

HOW WE RACK UP AGAINST THE COMPETITION			
	SPIRIT FOLIO RAC PAC [RP 28]	MACKIE 1604	SAMSON 2242
TOTAL NUMBER OF INPUTS	28, including 6 returns & tape returns routed to mix.	24, including stereo returns	30, including 4 stereo returns
EQ	3 Band with sweepable mid on Mono inputs 3 Band fixed on stereo inputs	3 Bands fixed only	4 Band fixed
AUX SENDS	6 (Aux 1-always pre-fade, Aux 2 -Pre/post switchable globally)	6	6
STEREO RETURNS	6 (4 stereo returns, 2 stereo FX returns)	4	4
HIGH PASS FILTER	Yes (at 100Hz)	No	No
SUB GROUPS	4 discrete	No (2 separate stereo buses)	No (2 separate stereo buses)
TWO TRACK RETURN	Yes	No	No



World Radio History



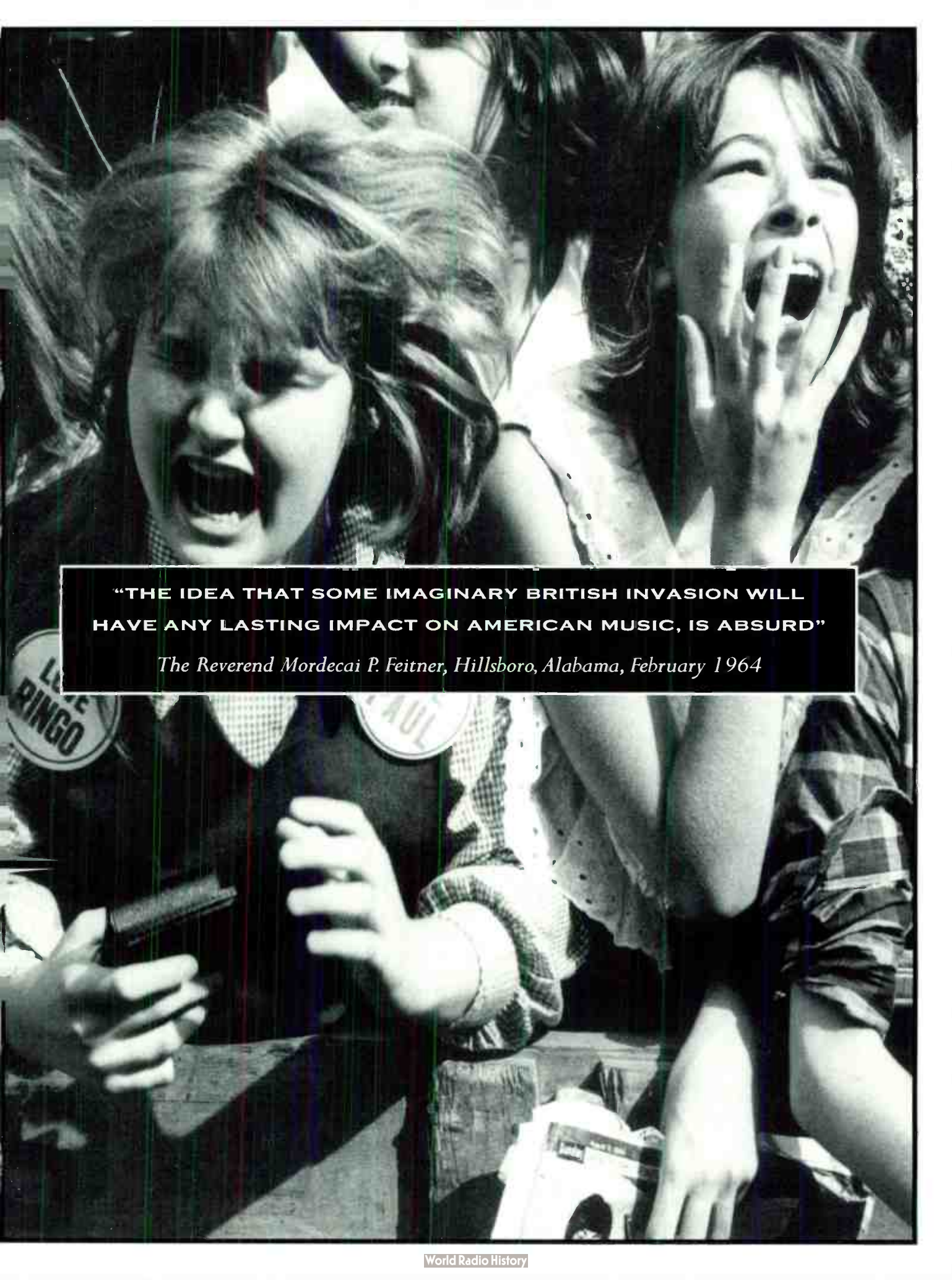
SPIRIT

By Soundcraft

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CIRCLE 77 ON FREE INFO CARD



**“THE IDEA THAT SOME IMAGINARY BRITISH INVASION WILL
HAVE ANY LASTING IMPACT ON AMERICAN MUSIC, IS ABSURD”**

The Reverend Mordecai P. Feitner, Hillsboro, Alabama, February 1964

BRITISH SOUND.

IT'S BACK IN THE U.S...BACK IN THE U.S...

*Introducing the next British Invasion.
A range of high-quality mixing consoles from Spirit—by Soundcraft.*

30 years ago, the British Invasion reshaped American culture and American music. Hordes of screaming fans became the icon for the impact and energy of the new British sound. Today, you can recapture that spirit in a line of mixing consoles backed by a tradition of more than 21 years of British engineering excellence. True British Sound. The first time you heard it, it probably came from a Soundcraft board. While it may be hard to define,



SPiRiT RAG PAC

Every Spirit board carries with it the Soundcraft philosophy of audio excellence, superior componentry and total quality assurance.

it's impossible to miss - that rich, pure sound that comes to life in the EQ. Spirit mixers are designed with that same distinctive engineering. From our compact rack mountable boards to the most advanced of our automated studio consoles, every Spirit mixer delivers that authentic sound quality that makes your music unique. If making music is what you do, then experience Spirit by Soundcraft. Genuine sound that began with the British Invasion.



SPiRiT, THE NEXT BRITISH INVASION

 **SPiRiT**
By Soundcraft

H A Harman International Company

SPiRiT
By Soundcraft

ASCAP
SPiRiT ENTERTAINMENT
Time:
8:45-10:00 AM
10/1/1974

E-45 125-B (SP)
Produced by
Soundcraft (UK)
Engineers:
DOD Electronics

BACK IN THE U.S....
(The Next British Invasion)

(Words and music: Simon Blackwood, John Johnson)
(Backing vocals: Gary Lynn, Wayne Morris)



ASCAP
SPIRIT ENTERPRISES
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1100

E-45 125-B (SP)
Produced by
Soundcraft (UK)
Engineers
DCC Electronics

BACK IN THE U.S....
(The Next British Invasion)

(Words and music: Simon Blackwood/John Johnson)
(Backing vocals: Gary Lynn Wayne Morris)



SPIRIT, THE NEXT BRITISH INVASION

Some think of the 'British Invasion' as that one unforgettable day in February 1964, when the Fab Four first set foot on U.S. soil. America had never experienced anything like the hysteria and energy that the new British Sound created on this side of the Atlantic.

But the British Invasion was more than just a single event. It was a movement that, as it gained momentum, changed American pop culture and the music we listened to. And not only did the music change, but so did the way it was produced.

And Soundcraft was there.

Shortly after the initial wave, Soundcraft manufactured their first console. With that board was born the Soundcraft philosophy of uncompromised audio excellence through precision engineering and total quality assurance.

Now, more than 21 years later, Soundcraft and Spirit have become synonymous throughout the world with high quality mixing consoles that define British Sound.

The Spirit mixing boards of today reflect the impressive heritage of the Soundcraft name. From our compact mixers to our fully automated studio consoles, every product carries with it the promise of unmatched sound quality. Take a look through this catalog at some of our most popular mixers. Then see your dealer for a demonstration.

You'll discover why Spirit is the Next British Invasion.



SPIRIT

By Soundcraft

THE SPIRIT RAC PAC

For Live and Studio Mixing, Rac Pac gives you the best of both worlds.



The Spirit Rac Pac was designed with one purpose in mind: to produce a mixer that combined all the qualities of a studio mixer with the special requirements of mixing live. While the Rac Pac's impressive array of features put many larger mixers to shame, the combination of sound quality and total dependability makes the Spirit Rac Pac perfect for both digital multitrack recording and the most punishing tour schedule.

- Sweepable Mid EQ from 250Hz to 6kHz.
- True Direct Outs - Individual inserts and equalized direct outs.
- All mono channels feature mic and line inputs with gain adjustments from -50 to +8.
- 4 Discrete Subgroups assignable to separate L/R stereo outputs.
- 28 Total Inputs, including 6 stereo returns and tape returns routed to mix.
- High Pass "Rumble" Filter.
- 6 Auxiliary Outputs with the ability to solo all 6.

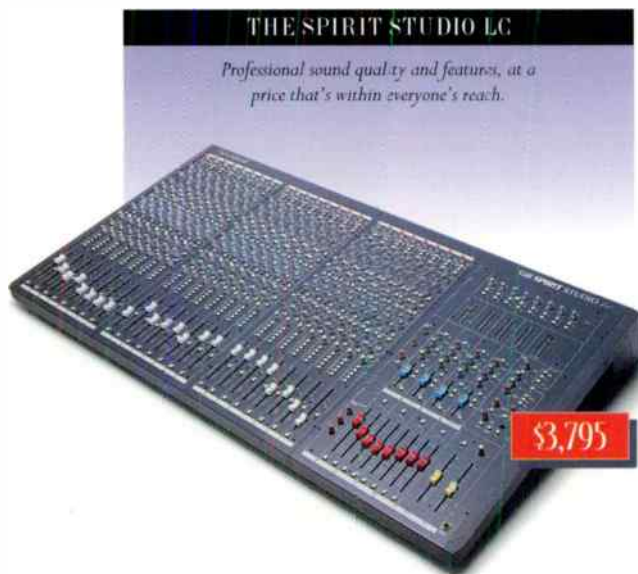
The latest addition to the Spirit line of mixers was born out of a need for a small, high quality console that was both versatile and affordable. With a frame size of just 10.5 x 12 inches, we think you'll be amazed at the range of features we've managed to pack into this innovative little machine. The Spirit Folio Lite is ideal for virtually every field of sound processing, from simple home recordings to live sound applications.

- Up to 16 inputs at mixdown, including 4 mic inputs.
- 2-Band EQ on every channel.
- Inserts on the 4 mono inputs.
- Aux 1 pre/post switchable.
- Headphone output and L/R outputs for monitors.
- 2-Track Return (routeable to mix for extra stereo return).
- Switchable Phantom Power.
- Sturdy construction - tough enough for the road.

THE FOLIO LITE

The features of a big mixer, in the most compact console yet.





The Spirit Studio LC is typical of the Soundcraft philosophy. The LC is built with the same integrity of construction, precision componentry and total quality assurance that you find in Soundcraft's biggest and most expensive consoles.

The 8-bus Studio LC achieves much more for much less than any other mixer in its class. Compact enough for even the smallest studio, the LC gives you the features and creative control that you'd expect from a console twice its size. It can juggle your signal and effects effortlessly, and it's so quiet, it's virtually transparent to digital recording. The Studio LC - Professional sound quality at a price you can afford.

- In-line design for up to 82 inputs at mixdown (including tape return, stereo inputs and effects returns on the 32 channel version).
- Direct Outs on every channel for 16, 24 or 32.
- 8-Bus Group Section for subgrouping or sending grouped signals to individual tape tracks.
- 3-Band EQ with two sweepable bands and EQ in/out switch on every channel.
- 8 Auxiliary Sends (10 including mix B as a stereo master send).
- Dedicated submix input allows an external mixer to be added.
- Fader Flip on every channel to allow path redirection of input signals without repatching.
- Individually switchable phantom powering on each channel.

The Spirit Live 4 is a highly versatile mixing console that's the number one choice for live recording. Built to the same exacting standards of sound quality and reliability that have made Spirit mixers famous, the Live 4 is ideal for controlling your in-house sound system. With the choice of 12, 16, 24 and 32 input versions, there is a model to suit virtually any size installation. With its rugged design, reliability and superb audio quality, the Spirit Live 4 gives you the performance you're looking for in a live mixing console.

- 12, 16, 24 or 32 inputs.
- 3 band EQ including sweepable mids, 250Hz -8kHz, swept LO EQ 40Hz -400Hzx.
- 5 Auxiliary sends.
- Left and right XLR outputs and XLR mono output are ground compensated.
- 4 groups with inserts and direct outs, ground compensated.
- Channels have balanced XLR and 1/4" inputs, and ground compensated direct outs.
- Full talkback facility.
- 100Hz High Pass filter.

THE SPIRIT LIVE 4

Superb audio quality makes the Live 4 the number one choice for your most demanding PA requirements.

\$3,995



THE STUDIO 8

Spirit Studio 8 is the perfect centerpiece for any studio, from 8 to 24 track.

\$4,795



The Studio 8 has been superbly engineered to provide you complete creative control of your music. During recording, the Studio 8 has 8 assignable subgroups to feed your multitrack, 2 foldback sends and a 4-band sweepable EQ. We've also included a tape send on every channel so you can feed individual instruments direct to a multitrack. Inserts on every channel, group and mix out provide ample scope for manipulating signals at any stage of the recording process. It's this kind of engineering innovation that continues to make Spirit the affordable leader in professional mixing.

- Inline design (up to 72 inputs at mixdown including effects returns & 2 Track return on the 32 channel version).
- 4 band EQ with high-mid 500Hz-16k and lo-mid 50Hz-1.6k.
- 4 Auxiliary sends & 2 foldback sends (auxiliary 3 and 4 assignable to monitor).
- 8 Subgroups with direct outs & inserts (effects assignable to groups).
- 4 stereo returns.
- Built-in talkback mic.
- Ground compensated outputs and balanced inputs.
- Individually switchable phantom powering on each channel.

PRODUCT SPECIFICATIONS

RAC PAC	FOLIO LIFE	STUDIO LC	LIVE 4	STUDIO 8
OUTPUT NOISE Typical Group Output Input Faders Down Group Fader Down Mix Output Groups routed to mix Mix Fader Down	MIX NOISE Input Faders Down Master Faders up	OUTPUT NOISE Any Output, Fader or Master down	NOISE WITH LINE INPUTS UNITY GAIN	NOISE WITH LINE INPUTS UNITY GAIN
87dBu 92dBu 92dBu 83dBu 98dBu	< 81dBu Master Faders up	Any Output, Fader or Master down 95dBu	150Ω	150Ω
AUX NOISE Typical Input Sends Down	AUX NOISE Input Sends Down	BUS NOISE 1kHz 24 Channels routed, Input Faders down, Masters Up	MIX NOISE Input Faders Down Channels routed mixsters > max	OUTPUT NOISE (Master down) Mix Left & Mix Right
85dBu	< 88dBu	Mix 80dBu Mix B 83dBu Any Aux Output, Master at max 82dBu	82dBu	98dBu
E.I.N. Source resistance gain maximum	E.I.N. Source resistance 150Ω	E.I.N. Mic Input, mix gain 150Ω	GROUP NOISE Input Faders down, Channels routed groups at 0dB	MIX NOISE 24 Monitors and channels routed
150Ω 129dBu	129dBu	129dBu	84.5dBu	80dBu
DISTORTION (THD) Mic input, gain 30dB Group Out @ +14dBu, 20Hz - 20kHz	DISTORTION Mic gain 30dB Mix Out @ +14dBu, 20Hz - 20kHz	C.M.R.R. (measured at 1kHz) Mic Input, mix gain Line Input, unity gain	AUX NOISE Input Faders down, Aux outputs at max 4 stereo sections routed to Aux 1 Aux 1 Aux 2 thru 5	E.I.N. Mic Input, mix gain 150Ω
< 0.005%	< 0.005%	70dB 51dB	81dBu 84.5dBu	129dBu
CROSSTALK (measured 1kHz) Input fader attenuation (top to bottom) Aux Send attenuation Adjacent Channel	CROSSTALK (measured 1kHz) Input fader attenuation Aux Send attenuation	DISTORTION Line In to Mix or Group via EQ (set flat) at unity gain +20dBu Input & Output, typical Stereo Returns to Mix Mic at 30dB sensitivity, -14dBu in +20dBu at Mix Output	C.M.R.R. (measured at 1kHz) Mic Input, mix gain Line Input, unity gain	C.M.R.R. (measured at 1kHz) Mic Input, mix gain Line Input, unity gain
>95dB >88dB >92dB	>85dB >84dB	0.006% 0.003% 0.006%	90dB 55dB	90dB 55dB
FREQUENCY RESPONSE (measured 20Hz - 20kHz) Line Input via Group to Mix Out	FREQUENCY RESPONSE 20Hz - 20kHz relative to 1kHz	CROSSTALK (measured 1kHz) Typical Fader cut off Typical Aux Send cut off Channel Mixer Routing Switch Isolation Pan Control Stereo Isolation	DISTORTION (THD 1kHz at +20dBu) Line In to Mix Outputs Line In to Group Outputs Line In to Aux Outputs	DISTORTION (THD 1kHz at +20dBu, 20Hz to 20kHz bandwidth) Line In to Mix Outputs Line In to Group Outputs Line In to Aux Outputs Line In to FB Tape Send with +20dBu Group Out
±1dB	±1dB	>90dB >90dB >90dB >65dB	< 0.0035% < 0.0030% < 0.025%	< 0.006% < 0.006% < 0.006% < 0.006% < 0.006%
INPUT/OUTPUT IMPEDANCES Mic Inputs Line Inputs Outputs	INPUT AND OUTPUT LEVELS Mic Inputs max level Line Inputs max level Any Output max level Headphone Output.	FREQUENCY RESPONSE Any Input to Any Output 20Hz to 20kHz	DISTORTION (THD 1kHz at +20dBu) Line In to Mix Outputs Line In to Group Outputs Line In to Aux Outputs	CROSSTALK (measured 1kHz) Channel on Switch Isolation Max Channel Fader attenuation Channel Pan to Group Isolation Channel and Monitor Isolation Switch isolation FX Return to Mix FX Return to Group
2kΩ 10kΩ 75Ω	130mW into 600Ω 105" x 120" x 15"	±0.5dB	< 0.0035% < 0.0030% < 0.025%	>100dB >89dB >76dB >100dB >100dB >85dB
INPUT AND OUTPUT LEVELS Mix Inputs max level Line Inputs max level Any Output max level Headphone Output 150mW into 600Ω	WEIGHT (net) Console Power Pack	INPUT/OUTPUT IMPEDANCES Any Output Mic Inputs Line Inputs Stereo Returns Insert Returns Tape Returns 2 Track Returns Sub Mix Input	FREQUENCY RESPONSE Line In to Mix L/R, Groups Aux Outputs Line In to Mono Output	CROSSTALK (measured 1kHz) Max Channel Fader attenuation Max Aux Send attenuation Channel Pan to Group Isolation Channel and Monitor Isolation Switch isolation FX Return to Mix FX Return to Group
+16dBu +28dBu +22dBu	2.5kg/5.5lb 0.6kg/1.3lb	80Ω 2kΩ 10kΩ 10kΩ 3kΩ 10kΩ 10kΩ 10kΩ	±0.5dB +1dB	>100dB >89dB >76dB >100dB >100dB >85dB
DIMENSIONS (H x W x D) Freestanding Rack-mounted	DIMENSIONS (H x W x D) 105" x 120" x 15"	MAXIMUM OUTPUT LEVELS Any output max level into 10kΩ	INPUT/OUTPUT IMPEDANCES Mic Input Line Inputs Insert Sends Insert Returns Outputs	FREQUENCY RESPONSE (measured 20Hz to 20kHz, net, 1kHz) Mix L/R, Group, Aux Outputs
6'5" x 19'0" x 14'0" 19'0" x 14'0"		+21dBu	2kΩ 10kΩ 75Ω 10kΩ 75Ω	0.5dB
WEIGHT (net)	WEIGHT (net)	MAXIMUM OUTPUT LEVELS Mic Input at min Line Input at min Tape Return (+4dBu input) Stereo Return (+4dBu input) 2 Track Return Sub Mix Input	INPUT/OUTPUT IMPEDANCES Mic Input Line Inputs Insert Sends Insert Returns Outputs	FREQUENCY RESPONSE (measured 20Hz to 20kHz, net, 1kHz) Mix L/R, Group, Aux Outputs
6.6kg/14.5lb	6.6kg/14.5lb	+14dBu +21dBu +25dBu +25dBu +21dBu +21dBu	2kΩ 10kΩ 75Ω 10kΩ 75Ω	0.5dB
		DIMENSIONS (H x W x D) 24 Channel	INPUT AND OUTPUT LEVELS Mic Inputs max level Line Inputs max level Mix out Max Mono out Max Aux out Max	INPUT/OUTPUT IMPEDANCES Mic Inputs Line Inputs Insert Sends Insert Return Outputs
		7'25" x 45'5" x 25'5"	+10dBu +30dBu +21dBu +21dBu +21dBu	2kΩ 10kΩ 75Ω 10kΩ 75Ω
		WEIGHT (net) Console	DIMENSIONS (H x W x D) 24 Channel	INPUT AND OUTPUT LEVELS Mic Inputs max level Line Inputs max level Mix, Group & Aux Out max levels
		28kg/61lb	3'3" x 5'0" x 23'5"	+10dBu +30dBu +21dBu
			WEIGHT (net) Console	DIMENSIONS (H x W x D) 24 Channel
			20.6kg/45.3lb	3'5" x 4'7" x 31"

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MY LEFT FOOT: Danny Elfman displays a hidden talent with his Boingo bandmates.

concern I had for *Pee Wee* was getting a sequencer and learning how to clock it to SMPTE off the video to set tempos for me to follow.

So did you essentially teach yourself film scoring?

I kind of learned over the course of *Pee Wee* and the next one or two films; it evolved into a system that worked for me.

What would you say was your breakthrough, when you decided: "I've really taught myself this"?

I think about halfway into the process of writing *Pee Wee* I learned that I could understand timings and how to make things work around them. It wasn't as hard as I thought. Once I got the hang of making the click work against the screen and timing out action, it started becoming easier. It wasn't until I heard the orchestra playing on *Pee Wee's Big Adventure* that I felt I didn't completely mess up their film.

Did you enjoy creating the score for *Batman*? What was the inspiration?

Batman was actually a lot of work. It was fun after the fact, listening to it, but doing it was a real white-knuckle project. People don't realize the amount of time it takes to put together 70 minutes of music.

I found inspiration while walking on the Gotham City set. I was flown out to London to check it out and that's where I really heard what became the main theme. The initial impulse of creating it, however, came while I was on the plane on the way home. It was in my head and I was afraid I'd forget it before I landed. All

it would take was me falling asleep to erase it, so I went into the bathroom to record it. I was too shy to start recording it in my seat. I'm much happier on the ground where I can get to a piano. Unfortunately, you can't bring pianos on airplanes. At moments like that, when there are no other instruments around, the tape recorder is an important instrument.

Were you immediately able to get the hang of writing music to hit points?

Yes. Actually, it was great to start off on a comedy because there are tons of hit points. I'm there on my first film and I was doing a three-minute cue that would catch 55 hit points. It was a great training program because I learned that I could really get accurate if I wanted to. I also learned that I had a good instinct for it. Between that and the next film, *Back to School*, I learned to trust my instincts with tempo. When I watched the film I would hear a tempo in my head and four out of five times that tempo would be dead-on with the editor's rhythm. If I found the right tempo for the scene, it was very painless to make the hits work against the action.

Had you known anything about SMPTE code at this point, or did learning about it seem daunting?

No, it actually was relatively easy. I thought it would be much more daunting than it was, until I started to do it. But I had a good music editor who encouraged me. He's still my music editor after nine years — Bob Badami. It was just luck that he was given to me as my music editor. He was not condescending at all in terms



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of my being new. His attitude was, "Don't worry about it, take your time and where you have problems, I'll help you."

What type of video lock-up system do you have?

In my project studio, I have a 3/4-inch video machine because everything in the work arena is 3/4-inch.

Consoles? Tape machines?

I have a Sony/MCI 24-track machine and two new Alesis ADATs. I do a lot of my prerecording at home. Whenever

I have a lot of sampled things or synthesizers and percussion to work on, I lay it all down on the 24-track and bring it in to play with the orchestra. I don't like to spend time on the scoring stage doing a lot of synthesizer work.

Is there any particular gadget or piece of equipment you see as helpful to you?

The only thing I really use a lot is the Mark of the Unicorn Performer software. I can move around it really fast;

it's second nature for me. Basically, I use Mark of the Unicorn on every cue for my click.

What keyboards or synthesizers do you use?

Well I just have an 88-key Yamaha KX-88 keyboard (MIDI controller). For synthesizers, I'm always switching. I use a lot of E-mu Proteuses for mock-up stuff cause it's always easier to have a load of sounds available all the time.

Anything that you prefer for string sounds, horns and other orchestral sounds?

Horns are always the worst in my own library. I don't have any samplers that have good brass. Strings are always the best. Right now, I'm using a Roland S760 with a CD-ROM library. I use that for a lot of the strings, but I also use a couple of E-mu EIII's and an EIII XP. I have a library of woodwinds, string sounds, and percussion sounds that I use off the EIII. It's mainly a lot of Emulator and Proteus stuff mixed in with this newer Roland sampler and a digital Roland piano.

How much of your scoring work is free reign and how much is work for somebody else's vision?

I've always felt I had free rein, but the tasks are right up there in front of you when you're a composer. You're not writing a concerto or symphony, you're trying to make the film work and to be original at the same time. In film scoring, the primary objective is to enhance that film.

Do you alter your sound from movie to movie, or do you have a recognizable trait in each score?

Obviously, I have a bent toward off-center music because I have a bent toward minor keys. I love something that's a little bit twisted. I try to stop myself from getting too monotonous by doing films like *Midnight Run* or *Sommersby* or *Black Beauty*, because I still love romantic, old-fashioned scores as well. *Darkman* was an excursion into 1950s-style, melodramatic film-scoring, which I really love. If you have an idea for a score, how do you go about recording it?

Well, there are two stages. The first stage I go through is a process where I work up demos of a lot of the major scenes on synthesizers. I'll play them against screen for the directors so they'll have a good idea of what the melodic content is before we get to

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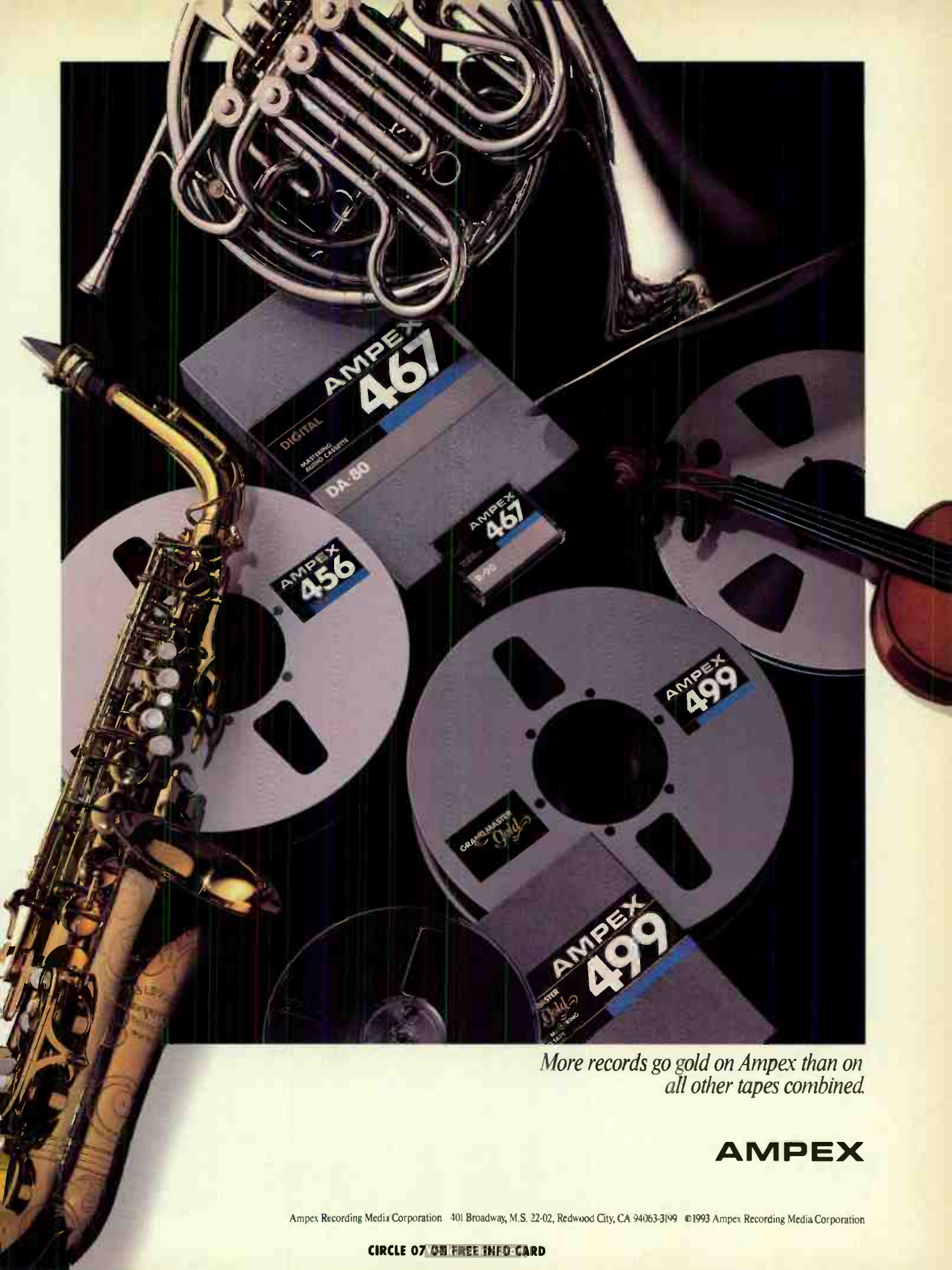
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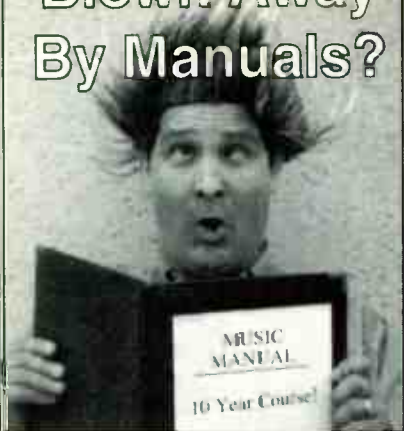
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TECHNIQUES RECORDING

the scoring stage. I have to warn them, "Trust me, it will sound much better," because it's initially a cheesy-sounding version of the final product. I used to have a little routine down where I would play a cue from a *Batman* synth demo, and then I would play them the real thing, which of course would sound ten times as big. I would say, "Just keep the difference in mind when I play you this next cue from your film." There's a big difference between what an orchestra can deliver and what synthesizers can deliver.

The second stage, then, is laboriously writing it all down bar by bar. Did you teach yourself music notation?

I taught myself music in the earlier incarnation of Oingo Boingo. For eight years I was with a musical theatrical troupe, the Mystic Knights. The pieces started to become more and more complicated and eventually I had to start writing them all down. So I taught myself notation, and even though it was primitive, it worked. By the end of the Mystic Knights, I had really learned to trust my ear because I was notating relatively complex pieces. I just learned that if I took my time I could write it all down. I wasn't fast at writing, but with a little patience I could get it all on paper.

What is the best part of composing?

The best part for me is when I'm coming up with the ideas. I know it's going to sound really good. Or I know it's going to sound really insane, or "out there," or unusual — and I just start laughing and can't wait to hear it. It's like I've got this movie in front of me and there's a certain point when I've just nailed it. I've been searching and searching for this thing and there it is. There it is looking at me, and I've grabbed it — I've got the little sucker. And it's not going to get away.

What brought you back to Boingo?

I had already retired the band mentally two or three years ago. When we began recording, I started coming up with these new songs, "Insanity" being the first. All of a sudden, I was like, "Hey guys, let's do some rehearsals and see what this stuff sounds like." So we went into the studio to do some tracks and try out some new ideas. But I could tell it was going to be tough because the stuff I was thinking of, except for "Insanity," was very guitar-oriented. I always wanted to do something that was fun and simple — something that we could just do live without having to rely on sequencers.

Speaking of "Insanity," that song seems to be a blend of your *Batman* compositions and earlier Oingo Boingo songs.

With "Insanity," I let a few worlds come together that I've always kind of held apart. I finally said, this time around, "Why am I holding them apart? I don't have anything to prove anymore. I might as well just let them do what they want to do."

Did you have any idea what the final version of the Boingo album would sound like?

The final album was nothing like the album I thought I was going to make. It's funny, because people ask me what type of album I'm going to do and I have learned it's bad luck to answer them because, whatever I say, it will end up being the opposite. That theory applies to this album even more so, because I went in thinking we'd make a simple project album and it ended up being the most ambitious project we had ever done. At one point we had 90 minutes recorded, and we said, "If we keep going we're going to have a double album and what's the point?" So we forced ourselves to stop. **EQ**



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Rick DePofi & Craig Bishop
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¹ Former posts include quality assurance with Warner Brothers, Sheffield Labs, Rainbow

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John Williams • Ground Zero Studios • New York, NY

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Michael Frondelli,
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How to Master CD-R Mastering

Your guide to the now-affordable world of mastering on recordable CDs (CD-Rs)

BY BOBBY OWSINSKI

I have seen the future of mastering and the future is...CD? Yes, recordable CDs (CD-Rs) are now growing in popularity and practicality as the mastering medium of choice, making them a viable substitute for the venerable Sony 1630.

Not since the days when studios had cutting lathes has it been possible to actually hear the final product before mass duplication. Now, with the price of CD-Rs coming down to an affordable level, every studio and mastering lab can sport this advantage, along with a few side advantages.

CD-Rs were once completely out of reach of the average project record-

ing studio — or any studio for that matter — and were relegated to only the most elaborate of mastering studios. Even then, they were only used as “Refs” (at about \$300 per disc) to enable the artist or producer to hear the CD before the production CDs were actually replicated. That has all changed now, with the price of CD recorders falling drastically and pressing plants now taking CD-Rs as an acceptable medium for replication.

SOME BACKGROUND

In order to understand why a CD-R is preferred by pressing plants, a little background on how a CD is made is required. After you have mixed your multitrack down to a mix master, be it DAT or 1/2-inch 2-track, this mix master must take several steps before the CD hits the stores. In the past, the mix master was transferred to the standard Sony 1630 3/4-inch U-Matic format. This was usually done at an independent mastering facility or sometimes at the pressing plant (for those trying to cheap out). Before this transfer, the audio was usually sweetened with final EQ, compression, and level adjustments, if done at an independent facility. The 1630 U-Matic

was then sent to the pressing plant where it was “premastered,” which means that the PQ subcodes were inserted on the U-Matic at the appropriate song start and stop points. PQ subcodes are the index numbers and start and stop times that allow you to randomly access any tune on the CD. This “premastering” at the pressing plant usually took time and, therefore, an additional fee was charged.

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PMCD

A variation of the CD-R that is used primarily for mastering is the PMCD, or premastered CD, which was jointly developed by Sonic Solutions and Sony. The PMCD differs somewhat from a normal CD-R. The difference is that a PMCD already contains the index information and can be sent



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directly to pressing without any additional processing. With a standard CD-R, the disc must be scanned and a computer file created that is saved to a floppy and later fed into the computer to correctly regenerate the codes. The PMCD, however, is identical to the end product. It has effectively the same information that you would have on a completed 1630 U-Matic master, except that instead of having the information on a format that is unlike the CD (i.e., the tape on the 3/4-inch), it's

exactly like the end-result CD.

So, one big advantage of the CD-R or PMCD format is that when you give it to the client it's not *like* something that will be the CD, it *is* the CD, and is identical to the mass-produced product. This means that you can play it in any CD player, check it in your car, and so on. This is really a wonderful and convenient capability, as evidenced by a recent sampler compilation that I had to make. When we wanted to hear the masters at the

record company's office, we had to search high and low for a DAT machine. We didn't have access to a 1630 for playback, but just about every office had a CD player in which we could play the PMCDs and CD-Rs. That convinced me right there.

THE BOOKS

When it comes to the technical talk about CDs, sooner or later the matter of "Books" comes up. The "Books" are simply a set of technical specifications a CD must meet in order to be compatible with all others and therefore able to play on any player. Since there are quite a few specifications, it's easy to get overwhelmed and confused, but they're really quite simple once you get rid of the technical jargon. Basic-

The CD-R allows you to eliminate this most labor-intensive part of the premastering stage. It's a far more reliable medium than the tape-based 1630 U-Matic format, with virtually no dropouts or imperfections.

ly, when it comes to audio CDs or CD-DAs (Digital Audio), there are only two books that you have to know about: the Red Book and the Orange Book.

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Orange Book — This defines the standard for writable or recordable media such as CD-Rs and magneto-optical discs. It defines where the data

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TECHNIQUES MASTERING



DIGITAL DISCUSSION: CD-R units, like Yamaha's YPDR601, have recently come down in price.

can be written and, in the case of the MO, how it is erased and rewritten.

There are books for other types of CDs that contain digital information other than Red Book audio for computer or motion video data. These are:

Green Book — The compact disc interactive (CD-I) standard was released by Phillips in 1978 and allows for full-motion video on a standard 5-inch disc. The disc requires a dedicated CD-I player and is not compatible with an audio CD player.

Yellow Book — The CD-ROM standard for computer data.

White Book — This is sometimes known as Karaoke CD, and is used in applications where the combination of full-motion video and audio is needed.

CD-R RECORDERS

Not all CD recorders are made equal. Before buying, there are many things to look at that may make a big difference later.

CD recorders come in two types: the stand-alone analog/digital I/O models, and SCSI-based models that must be connected to a computer to work. The stand-alone models have the advantage of being able to utilize any outside source, either analog or digital, with ease. The SCSI-based models have the advantage of being able to print at double speed, with Yamaha soon to introduce a unit capable of 4X printing speed. It also gives you the ability to print Yellow Book (CD-ROMs) masters if you have the proper software. The disadvantages of a SCSI unit are that it must be connected to a computer, that it requires premastering software, and that the source material must be loaded into the computer before it can be printed.

Single Session Recorders — This means that you must record everything in one continuous uninterrupted session and do not have the ability to

go back and add additional material to the disc later. For instance, if you record 11 minutes onto a 74 minute disc, it might seem as if you have 63 minutes of recording time still available. However, you will not be allowed to record on the empty space if you try to do so after taking the CD out of the unit. Many early CD recorders were single session. Almost all the later models are the "multisession" type.

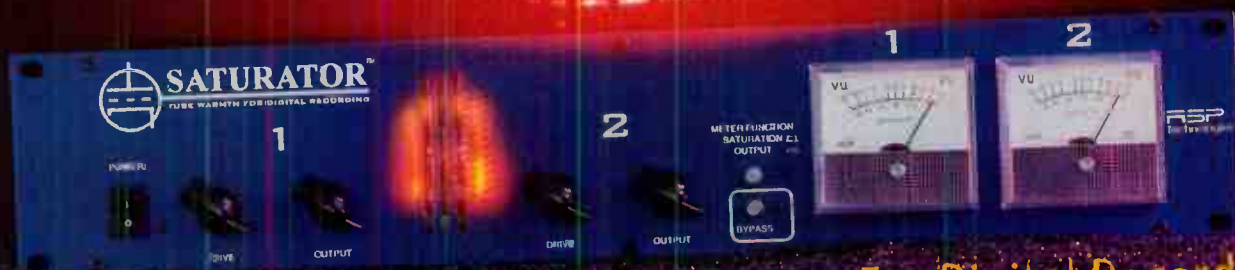
Multisession Recorders — Multisession means that you can record a CD, then record again at a later time on any available empty space. This is obviously the way to go. It should be noted that a PMCD recorder is not multisession; that really shouldn't matter, since in 99.9 percent of the cases you're at the final mastering stage and already certain which songs are to be included on the master.

THE FUTURE

Although the cost of both recorders and blank media is moderate at this time, all indications point to prices falling dramatically in the next 18 to 24 months. They have dropped quite a bit already. When Yamaha introduced the first CD recorder about five years ago, it came in at a hefty \$25,000. Prices now hover around the \$3000 to \$5000 range, and are expected to drop to as low as \$750 to \$1000 if the market expands as predicted. Prices of blank media are coming down as well, with blanks now costing about \$17 when bought in bulk. This could come down to about \$5 in time, again depending on the expansion of the market and the anticipated increased demand.

CD-Rs are definitely the way to go when deciding upon your final master format. There's nothing like popping your master into the CD player of your car or an available boom box to check out how it will sound. Once you've tried it, you'll never go back. **EQ**

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1995

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PREVIEW

INFORMATION SUPER TROLLEY



**1995 PREVIEW
FIRST LOOK**

The Roland DM-800 Workstation

A new entry slated to join the digital audio workstation ranks this December (1994) is the Roland DM-800. Based on Roland's successful DM-80 workstation, the DM-800 is an 8-channel hard-disk recorder and mixing system that has been integrated into a single housing. The system measures in at 26 inches x 11-1/4 inches, and weighs 14 pounds. The asking price is expected to be around \$6000.

Roland feels the self-contained, all-in-one-box philosophy can provide users with a multichannel disk-based system that has uncompromised quality and features, yet is still small enough for the working musician, video post, or audio professional to be able to simply grab it 'n' go. The DM-800's control surface is logically laid out, with an 8-channel digital mixer placed at the system's left-hand side, while auto-location, transport function, data entry, and display sections are located at the right.

Besides featuring a set of input controls that provides gain (variable from 0 to +20 dB) for each of the DM-800's four analog inputs, the digital mixing surface is comprised of eight channel faders, two stereo aux returns/line-input faders (allowing

effects returns or an extra pair of line inputs to be routed back into the mix), and a stereo main output fader. Located above each channel fader is a Status button and rotary pan pot. Status buttons allow you to choose record, play, or mute. Also, by pressing the desired Status and EQ button, the system's master EQ knobs can be assigned to a particular channel, giving you hands-on access to any of the system's eight, 2-band, parametric, digital equalizers. Mixer automation, with MIDI implementation for receiving messages from an external controller, is also fully supported.

The remaining right-hand controls are dedicated to system- and transport-related functions. These include a section that's mostly used for storing location points (up to 40 auto-locate addresses can be placed within a session), a standard tape-style transport control, system parameter buttons (allowing instant access to particular system functions), an alpha dial, and an alpha-numeric keypad.

The DM-800's readout panel includes indicator lights for showing hard-disk activity, sample rates (48, 44.1 and 32 kHz are fully supported), and sync source and time indication

(in SMPTE timecode, beats-per-measure, or min/sec). It also includes a 240 x 64 dot, 1.5-inch x 5-inch LCD screen that lets you view all the necessary system, waveform, and track-based parameters, without the need for an external screen. If you'd like to use a larger screen, all of the above information (as well as level metering and time readout) and an overview of the entire project can be displayed on a color CRT video monitor using digital RGB, S-Video, or standard composite video modes in either NTSC or PAL formats.

Roland has tackled the I/O (input/output) structure of this box in a rather interesting way. On the analog side, it has provided the system with four in and out ports (1/4-inch balanced TRS), one S/PDIF digital in, and two digital output ports. So where do the eight output channels come from? Well, although Roland feels that most users will be internally mixing these channels to the stereo output bus or to the four analog outputs, the additional four outputs can be easily routed to the digital out ports, where they can be converted using a couple of DAT machines for converters or by buying an optional 4-channel D/A box from Roland.

EQ's exclusive
look at Roland's
DM-800, which
gives you
everything
you need —
and more

BY DAVID MILES HUBER



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1995 PREVIEW FIRST LOOK



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Disk storage has been designed with the user in mind, in that room for two 2.5-inch internal SCSI hard drives (with current maximum capacities ranging to 810 MB apiece) has been built into the DM-800, so that you can buy the drive size that best fits your needs. However, if you already have drives or if portability isn't your bag, two external SCSI ports will let you plug in the drives of your choice. In addition, the drive format is fully compatible with the DM-80, meaning that drives with DM-80 soundfile data can be plugged in and used without a fuss.

Talking about drives always seems to lead to the subject of backup. In addition to the backing up of system files and setup data to a SCSI DAT drive, the DM-800 can also back all of its system parameters (including mix automation) and audio data to a standard DAT recorder via its digital I/O ports.

Another interesting feature is the RMDB (Roland Multipurpose Digital Bus) port. This nonspecific port has been designed so that Roland can add any number of future interface applications to the DM-800 as the company sees fit. For example, it intends to start by offering an eight digital I/O interface that can be directly connected to ADAT recorders (full BRC control over the DM-800 will be possible), as well as an RS-422 Sony protocol interface for remotely controlling the system directly from a video editor. (Other digital recorder interfaces are planned.)

Of course, sync is fully supported, allowing it to lock (at all frame rates) to an external SMPTE or MTC source or to act as a master by internally generating and distributing sync to external devices. A built-in SMPTE resolver allows the DM-800 to synchronize directly to nonsynchronous timecode. MIDI sync (such as Song Position Pointer and tempo maps) can be read or generated when working with MIDI devices that don't directly respond to timecode.

In short, the DM-800 is a full-featured, self-contained device that seems capable of jumping through all the "big boy" hoops at a fraction of the price, while throwing in a digital mixer to boot. This companion for the on-the-go working professional is bound to turn many a head. [Look for an in-depth review of the Roland DM-800 in an upcoming issue. — H.G.L.]





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SHOW 'N' TELL

This year's AES may go down in pro audio history as the show where multi-track hard-disk recording became a serious alternative for the audio masses.

Manufacturers are taking several different approaches in offering multitrack hard-disk recorders (HDRs), one of which treats the hard-disk unit simply as a replacement for a conventional multi-track tape recorder. The HDR interfaces with your recording console via analog inputs and outputs, performing much like any multitrack tape machine — without the need for a separate computer. Some units (like RADAR, now distributed by Otari) have optional remote controls available with transport and autolocate functions that allow the engineer to operate the machine like a conventional multitrack.

The Akai DR4d 4-track HDR (around \$2500) is also a self-contained unit. The DR4d features 1/4-inch balanced inputs and output jacks (four each) that can be switched between -10 and +4 operating levels. Like some of the tape-based digital multitracks, DR4ds can be linked together for up to 16 synchronous tracks of recording. Rumor has it that Akai is planning an 8-track version of the DR4d.

If you are looking to replace your studio's current mixing console while upgrading to an HDR, you might consider the "studio-in-a-box" approach to hard-disk recording. Systems such as the Roland DM-800 (see EQ's "First Look" in this section) or the Timeline Studioframe include the HDR mechanism itself, a digitally controlled mixer with an LCD read-out screen or video monitor and the necessary operating software.

If your studio equipment inventory already includes a computer, you might want to check out the Yamaha CBX-D5. The CBX-D5 is an HDR with analog and digital I/Os, and they can be operated via IBM, Macintosh, or Atari platforms.

If you want the ultimate portable studio, have a look at the Vestax HDR-6. This is a rack mount, 6-track HDR with 3-band digital equalization, 4 auxiliary sends, and 4 stereo effect returns.

And you didn't hear it from us, but keep your AES ears open for a major announcement regarding a new high-end introduction to the hard-disk recorder market.





1995 PREVIEW THE EQ 5-MINUTE INTERVIEW

George Martin Lets It Be

George Martin has been very busy lately, what with running London's Air Studios and being the keynote speaker at the AES Convention. EQ managed to track him down for a few moments and discuss his career.

EQ: Do you think you're a better producer now than you were when you started?

George Martin: I'm not as good a producer now as I have been because I'm old and don't hear as well as I used to. I'm probably bored too. It's been 43 years now making records, and I find now that it takes too long—I get impatient. I don't want to spend six months making a rock album when I could be doing six months of something I really enjoy.

So you like to work quickly now?

It's not that I like to work quickly, but I don't like wasting time.

Wasn't that the way it started with the Beatles, that things would happen quickly? Was that more in line with the way you'd like things to go now?

I always enjoyed working with them, but there was one period when they got very tedious; that was the *Let It Be* time when they didn't know what the hell they were doing. Sometimes the sessions would go on too long, they would go on too long recording one particular thing. But in the main I enjoyed working with them enormously. They were very productive, enormous fun, and we were all frightfully good friends. It was a team, we were all working together for the same purpose. I have very fond memories.

Is there anything you would have liked to have redone from your vast catalog?

Not really, because I don't look back too much. Once a thing is done, I put it away and forget it. I don't even keep the records, I don't keep memorabilia. **You don't have a collection of your own recordings?**

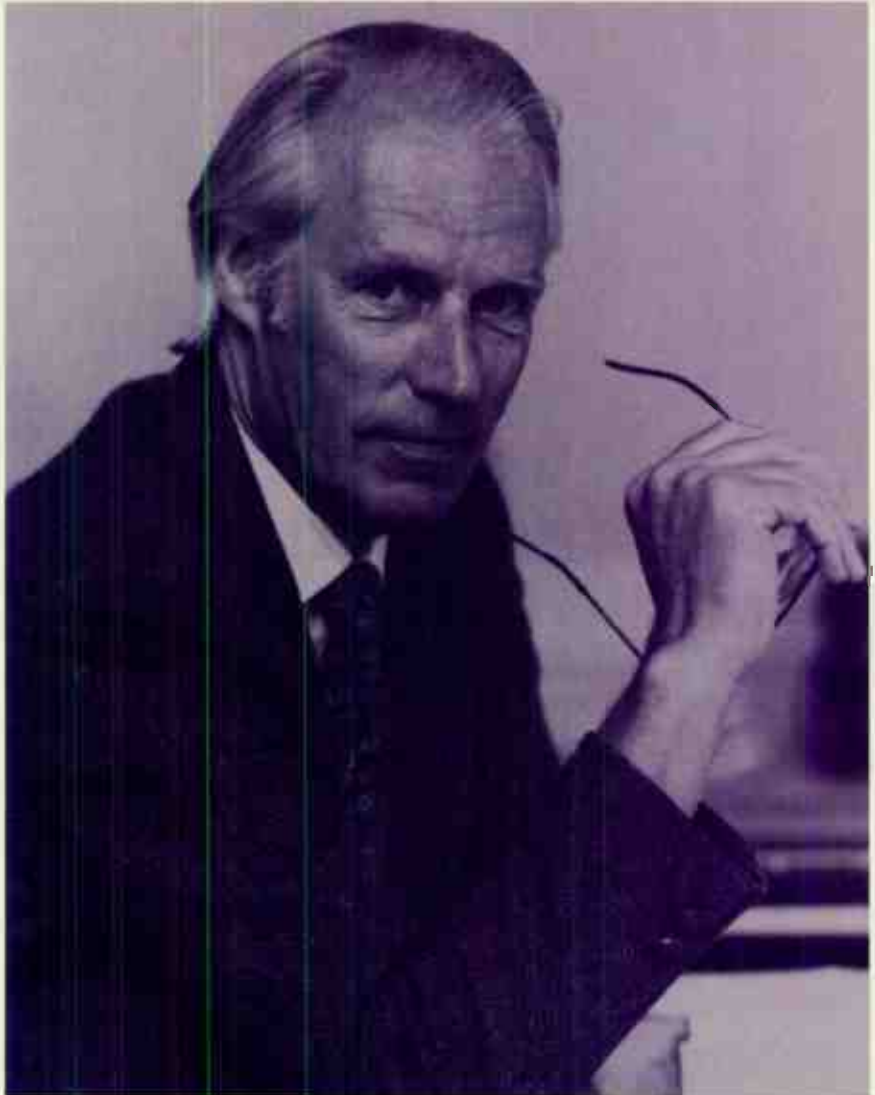
I like to move on. Forget it, it's gone. So therefore I don't say I wish I could have done that better, because you can't go back. I remember spending an evening with John Lennon and he said to me, "Everything we did was really

crap." I said, "John, how can you say that, it was bloody marvelous." But he said, "No, everything could have been done better." I said, "Are you saying you would like to do everything again?" and he replied, "Certainly. Everything I ever did I'd like to rerecord." I told him he was out of his mind, what about something like *Strawberry Fields*? He said, "Especially *Strawberry Fields*." I told him I was sorry but I thought it was one of the best we've ever done. Maybe he's making those records now the way he wants them—he would never get it done on earth!

And you don't feel like that about the Beatles materials? You wouldn't want to remake any of them?

Not really, no. The ones we did, I think we did right for the time, and the ones that didn't work out too well that you might have wanted to do again had a flaw in them anyway and probably weren't worth doing. I don't really like going back over things.

This modern tendency for megamixes, the 12-inch mix, 4-inch mix, 1972-rehash mix, and the 1994/5 rap mix is boring. It really is. Leave it as it is; if you want to create a new work, create a new work. —Zenon Schoepe



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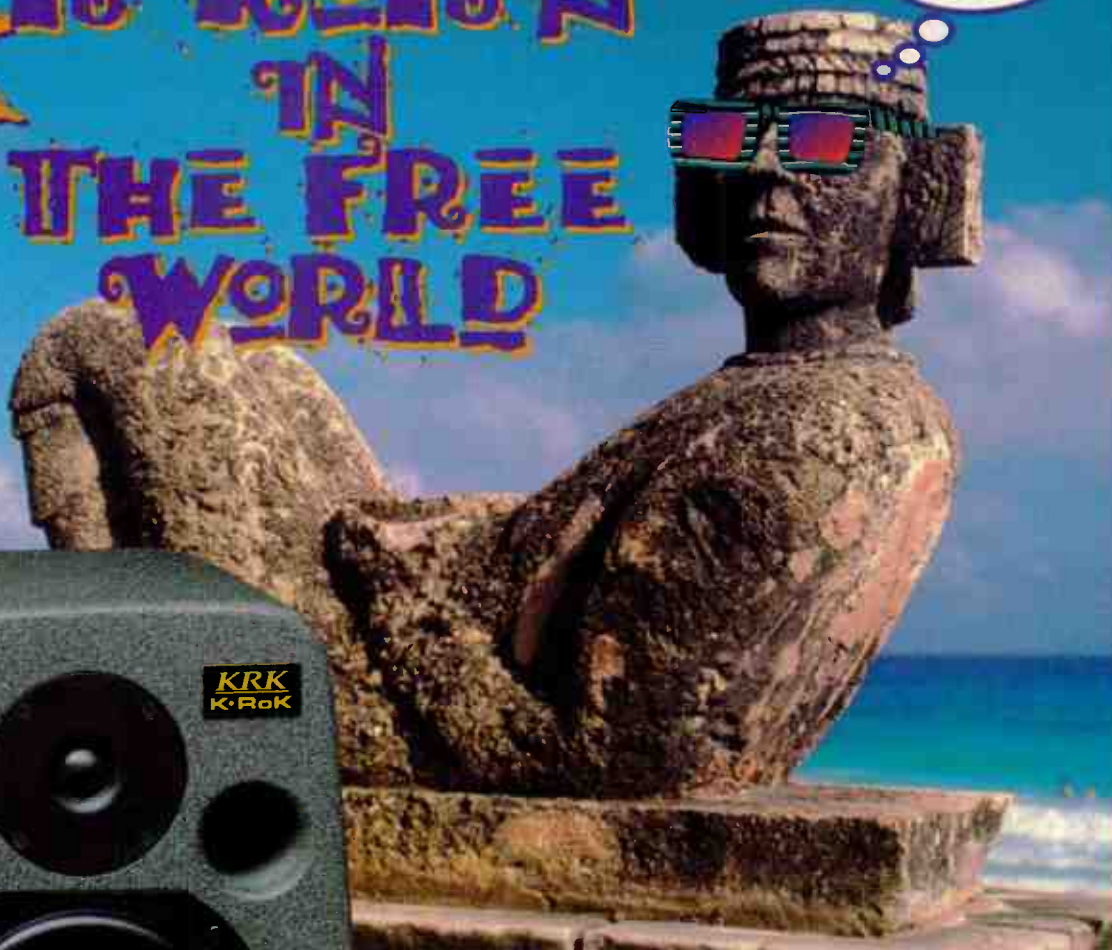
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MAKE YOUR OWN CDS

Accurate Sound will be unveiling three new CD writers. With these systems you just insert your audio DAT tape and in minutes you will be able to burn a fully "P-Q"-encoded CD suitable for use as a pressing master or for playing in a standard CD player. Two models employ Eastman Kodak's high-speed writers using an Apple Macintosh platform. The system includes a Kodak PCD 225 Writer, which is a 2X disc-at-once device. A second system uses the Kodak 6X PCD 600 Writer, the fastest in the world. It offers disc-at-once Red Book audio authoring at a sustained transfer rate of 0.9 MB per second. The complete system will include a hard disk, DAT recorder, audio acquisition board with software, and CD authoring software. The third system is the stand-alone Alea CD-maker. It features a Yamaha 4X burner, built-in DAT drive, and a hard disk. Future software updates are quickly loaded through a floppy port in the unit. For more information, contact Accurate Sound, 3475A Edison Way, Menlo Pk., CA 94025. Tel: 415-365-2843. Circle EQ free lit. #101.



MULTI MIXER

For this year's AES show, DDA is introducing the FMR console, a production console designed specifically for mixing with a variety of recording media and featuring a traditional split design similar to the famous AMR console. A new Bus/Tape Monitor module has a flexible input/output section to accommodate line level signals to and from the multitrack device. A bus trim potentiometer provides ± 15 dB of gain to the bus output, along with a bus trim adjustment to accurately set its 0 dB point. The module also includes a full routing



section to permit track bouncing, allowing four separate tape channels to be mixed to one alternative tape channel. For more information on the FMR, contact DDA at 448 Post Road, Buchanan, MI 49107. Tel: 800-695-1010. Circle EQ free lit. #102.

ADAT ADDITIONS

Alesis is introducing ADAT System 4.0, a major upgrade to their multi-track digital tape recorder. In addition, the BRC Master Remote Control has been upgraded to Revision 2.0. Major features of the System 4.0/2.0 upgrade include over 60 minutes of record time using ST-180 tapes, one button punch-in, and improved chase-lock sync performance. The release of these updates comes at the same time as the setting of new retail prices for both the ADAT (\$2999) and the BRC (\$1499). For more information, contact Alesis, 3630 Holdrege Ave., Los Angeles, CA 90016. Tel: 800-5-ALESIS, E-mail: ALECORP@Alesis1.usa.com. Circle EQ free lit. #103.

MORE IN SYNC

Tascam has introduced two free software upgrades for the DA-88 modular digital multitrack (MDM) recorder: Version 3.03 and Version 3.06. Version 3.03 provides faster lock-up times in conjunction with 3.06 for the SY-88 sync card, and quicker cleaning times. The most significant benefit noted by the Beta testers of 3.03 is the improved synchronization capability. V. 3.03 provides drop-out protection, enabling a slave DA-88 to be operated as backup. Version 3.06 is an upgrade for the SY-88 sync card. This upgrade now provides full implementation of Sony 9-pin protocol. For complete details, contact Tascam, 7733 Telegraph Rd., Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #104.



WAY DOWN

Genelec is introducing two new active subwoofers: the 1092A and the 1094A. Both have been designed to provide additional low-frequency extension, improved dynamic capability, and increased sound pressure levels when used with Genelec nearfield monitors. The 1092A is designed for use with the 1030A, 1031A, 1032A, and S30C, while the 1094A has been designed for use with the S30C, 1032A, and 1037A. Both units are supplied with a 3-channel crossover section with three electronically balanced inputs, and floating balanced outputs. The crossover is centered at 85 Hz with a low-pass slope of 24-28 dB per octave and a high-pass slope of 12 dB per octave. As with other Genelec active monitors, the 1092A and 1094A feature bass roll-off control, input-sensitivity adjustment, and active system protection. Frequency response is 29 Hz-80 Hz. For more information, contact QMI, 25 South St., Hopkinton, MA 01748. Tel: 508-435-4243. Circle EQ free lit. #105.





ON THE MARK II

The new Tannoy PBM 8 II represents the completion of the Mark II series of PBM monitors. The PBM 8 II employs an injection-molded polyolefin low-frequency cone that is mica impregnated for a high-grade minimalist crossover topology, and the result is an accurate, dynamic monitor that is suited to digital recording. The specs are: 125 watts peak power, 92 dB sensitivity, and 47 Hz–20 kHz frequency response ± 3 dB. For further information, contact Tannoy/T.G.I., 300 Gage Ave., #1, Kitchener, Ontario N2M 2C8. Tel: 519-745-1158. Circle EQ free lit. #11.



LOTS IN ONE BOX

Yamaha is introducing the CBX-D5 digital recording processor featuring 16-bit A/D and 18-bit D/A; real-time sample-rate conversion; two-channel simultaneous record and four-channel playback; a 4-band parametric EQ for each channel; and extensive MIDI control. The CBX-D5 provides sampling frequencies of up to 48 kHz, digital effects that include 82 reverb and modulation types, and digital inputs and outputs including AES/EBU, S/PDIF, Y2, and word clock. The unit supports the IBM, Macintosh, and Atari platforms.



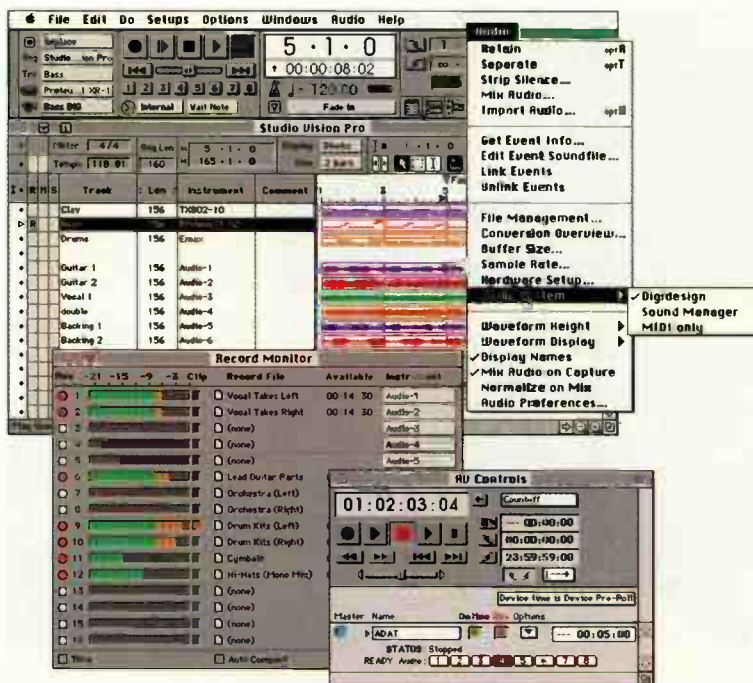
For more information, contact Yamaha, 6600 Orangethorpe Ave., Buena Park, CA 90620. Tel: 714-522-9011. Circle EQ free lit. #112.

THAT'S THE SPIRIT

Spirit recently introduced its new Studio LC console. Delivering up to 82 inputs on mix-down and available in 16-, 24-, and 32-channel versions, the Studio LC features an in-line design for flexibility, providing both channel and monitor paths on each input strip, as well as a Fader Flip option that allows channel and monitor signals to be switched without repatching. Eight-bus grouping makes the Studio LC a good choice for use with 8-track digital recorders, while tape send and return on each channel allows simultaneous recording on up to 32 channels. Additional channel features include 3-band EQ with in/out switches and sweepable mids and lows; high-pass filters; eight aux sends; and 100 mm level faders. For more information, contact Spirit/Harman DOD Group, 8760 S. Sandy Pkwy., Sandy, UT 84979. Tel: 801-586-8800. Circle EQ free lit. #113.

GET TOGETHER

Opcode's Studio Vision Pro is now compatible with Digidesign's Session 8 hardware, allowing eight-channel recording and editing at a lower cost per track than previously possible. Studio Vision Pro is now compatible with the original Session 8 hardware, as well as the new 882 Studio and 882 I/O interfaces. Studio Vision Pro supports DAE (Digital Audio Engine), which allows compatibility with all current Digidesign digital audio hardware, including Pro Tools (4–16 channels), Sound Tools II, Audiomedia II, Audiomedia LC, and Session 8. DAE is included free with Studio Vision Pro. This system combines Opcode's professional sequencing software program, Vision, with the ability to record and edit digital audio. Studio Vision incorporates nondestructive editing of the digital audio right along with the MIDI. You can view and edit up to 16 channels of digital audio in each editing window, alone or with MIDI information. MIDI machine control is also included. Retail price is \$995. For more details, contact Opcode, 3950 Fabian Way, Ste. 100, Palo Alto, CA 94303. Tel: 415-856-3333. Circle EQ free lit. #114.



Imagine Getting Slammed In The Chest With A Sledgehammer.



Now that you know what kind of low end these amps have, let's talk about why. Crown amplifiers are engineered with a damping factor in excess of 1000 (10 Hz to 200 Hz) while most amps are lucky to manage 50 to 100 over the same frequency range. The result of this high damping factor is incredible speaker control for some of the tightest, bone-rattling bass you've ever felt.

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No other amplifier is as faithful to live and recorded sound as Crown. That's why we're found in the racks of the largest tours and the hottest recording studios worldwide. But don't take our word for it. Compare the

sound of a Crown amp head to head with the competition and hear it for yourself.

For complete information on Crown amplifiers, including a free copy of our informative brochure *Amplifier Specifications—Facts & Fiction*, see your Crown Dealer or call us toll-free at 1-800-342-6939 ext. 11.

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CIRCLE 15 ON FREE INFO CARD



ALL AROUND MIC

Re-engineered Mark V and ST250 microphone systems from Soundfield are now available. The Mark V consists of a special microphone and separate processor. They offer unique design features that allow the user to steer and move the microphone in both real time and postproduction time while maintaining a fully three-dimensional output signal for surround sound use. For more information, contact QMI, 25 South St., Hopkinton, MA 01748. Tel: 508-435-4243. Circle EQ free lit. #115.



TALE OF TWO TAPES

3M is introducing two lines of digital audio tape at AES. The new audio S-VHS mastering cassette is specially designed for digital audio multitrack recording. Called the 3M ASD 40+, the product provides recording engineers with up to 42 minutes of record time at 48 kHz sampling rate. Features include an exclusive binder system and a stabilized polyester backing. 3M ASD tape utilizes the 3M Total Anti-Static System to minimize dust and dirt accumulations and reduce errors throughout the program. And for Hi8 recorders, 3M is offering the new AHD Audio Hi8 digital mastering cassettes. The AHD Hi8 digital cassette is manufactured with ultrafine metal particles that raise the signal-to-noise ratio. For more information, contact your local 3M Professional Audio Products dealer or representative. Circle EQ free lit. #116.

WELL RED

Focusrite has debuted its Red 4 precision stereo preamplifier. The Focusrite Red 4 maintains the attributes that have made the Red family of products successful and combines all the necessary



preamp features with several important extra functions. Transformer coupling and switchable sensitivity between +4 dB and -10 dB is provided for all inputs and outputs, allowing the preamp to be easily interfaced with any selection of professional or consumer equipment. A seven-input source selector is useful for interfacing with CD or DAT machines, as well as for extending monitoring options. The Red 4 also features balanced outputs, switchable balance and control filters, a Penny & Giles precision rotary level control fader, a large red LED panel, VU-type meters, and an integral power supply. For further information, contact Focusrite, 80 Sea La., Farmingdale, NY 11735. Tel: 516-249-1399. Circle EQ free lit. #117.

GO DIRECT

Akai Digital has released the DD1500, a modular direct-to-disk recording and editing system. The DD1500 supports multitrack recording to both magneto-optical and standard hard disks, and the modular design allows for system expansion. The complete DD1500 system consists of a DL1500 control unit, DD1550m mainframe, DD1500x disk drive housing, and DD1500a A/D D/A converter. Each DD1500x drive unit may contain up to two 1.3 GB MO drives, and each DD1500a will hold up to eight analog I/O pairs (XLR). Normal SCSI chaining allows external MO or hard disks to be connected to the DD1500x. The DD1500 will support 16-track recording/editing. RAM-based sampling and 16-channel real-time EQ options are planned for the near future. For the whole story, contact Akai, 1316 E. Lancaster, Fort Worth, TX 76102. Tel: 817-336-5114. Circle EQ free lit. #118.





THE LITTLE AMP THAT COULD

The new Tascam PA-20 MKII studio power amp is taking its first bow. It's a compact, single-rack-space, dual-channel power amplifier that has been designed to perform in project and personal recording systems. It delivers 25 watts per channel into 8 ohms. The amplifier exhibits a flat 20 Hz–20 kHz frequency response. The PA-20MKII is equipped with both balanced XLR and unbalanced RCA type inputs. It features a headphone monitor output and continuously variable level controls to attenuate the signal so that the sensitivity can be adjusted to optimize the gain structure of the speaker system. The PA-20 MKII can be bridged for a mono output of 50 watts. Its large flat-style power transformer handles continuous full power operation and provides a uniform thermal environment for all circuits. Retail price is \$250. For more information, contact Tascam, 7733 Telegraph Rd., Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #119.



LOOK AHEAD

D&R will be featuring its successful Vision Series consoles. The design of these boards continues D&R's philosophy of no-compromise electronics in a smaller, more affordable package. New to the line is the availability of meter bridges and the Dual Multitask Module. In addition, the Vision boasts sonics and specs equal to those of D&R's larger consoles. The Vision series is ideal for studios, postproduction houses, permanent installations, and sound-reinforcement applications. Vision is completely modular with five frame sizes and nine different types of modules to choose from. For further information, contact D&R, Route 3, Box 184-A, Montgomery, TX 77356. Tel: 409-588-3411. Circle EQ free lit. #120.

ACROSS THE BOARD

The Synclavier Company has introduced EditView 4.0. This fourth-generation computer editing software is the first completely object-oriented, cross-platform audio editing interface. EditView 4.0 can be used interchangeably on Synclavier PostPro systems as well as on Digidesign Pro Tools, Sound Tools, and Audio Media cards. EditView 4.0 can con-



trol PostPro and Pro Tools simultaneously, viewing tracks on a single interface and allowing the user to drag and drop audio files freely between them. The new software has been programmed in C++, making it readily portable between different computing platforms and completely object-oriented. Should you move an event, all data corresponding to it, such as level automation, move with it. Tracks can be graphically rearranged on screen by dragging. Multitrack edits can be specified by swiping a region. In addition, you can affect any number of events simultaneously—even when they are nonadjacent. For complete details, contact Synclavier, Rivermill Complex, Lebanon, NH 03766. Tel: 603-448-8887. Circle EQ free lit. #121.



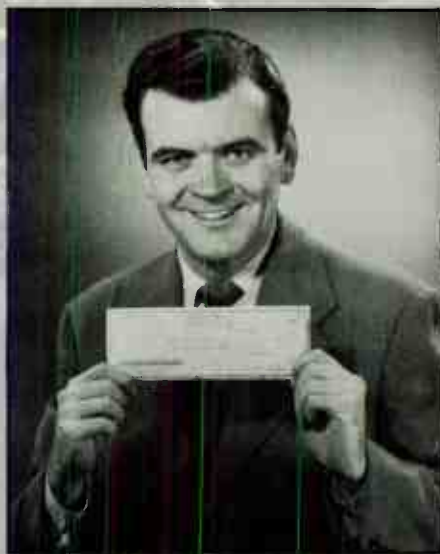
IN GOOD VOICE

Following on the success of the VHM-5 and Vocalist II, DigiTech is unveiling the Studio Vocalist, a double-rack-space vocal harmony processor. It provides you with vocal thickening, doubling, harmonies, and pitch correction, with flexibility in editing and patching. The Studio Vocalist generates up to five-part harmony from a single vocal input. It recognizes the actual notes of a vocal performance and produces musically correct harmonies based on either standard or user-defined scales. The processor features 99 programs covering a broad range of musical harmony styles in addition to 99 user-programmable locations. A digital I/O plug-in expansion card is scheduled for the future. For more information, contact DigiTech, 8760 S. Sandy Pkwy., Sandy, UT 84070. Tel: 801-566-8800. Circle EQ free lit. #122.

CROWN JEWEL

Crown is offering IQ Sys-Config II software, a new package for use in IQ System applications. Sys-Config II combines the best features of original Sys-Config software with IQ Turbo software. With Turbo, graphic elements can be constructed on screen to correlate selected facets of system components, or the entire component. Sys-Config II offers control through a menu-driven package. For complete details, contact Crown, 1718 W. Mishawaka Ave., Elkhart, IN 46515. Tel: 219-294-8000. Circle EQ free lit. #123.

Upgrade your old amp...



...Get a \$200 check.

To those who thought that a Genelec was out of reach, we offer a unique invitation. QMI, the exclusive US distributor for Genelec, will refund \$200 against the purchase of a pair of Genelec 1030A studio monitors in exchange for your old amplifier. In addition, your old amp will be donated to the T.J. Martell Foundation for leukemia, cancer and AIDS research.

The 1030A sets new standards in performance levels for compact monitoring. Coming packed with Genelec's exceptional array of features (such as active equalization, directivity control and optimized amplifiers), the 1030A will open the window into your mixes with its uncanny ability to separate instruments and place them accurately in space.

GENELEC®



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ACTIVE MONITOR
\$1,998/PAIR MSRP

BUY A PAIR OF GENELEC 1030A'S... SEND QMI YOUR OLD AMP... GET A \$200 CHECK.

1.) This offer valid for product purchased November 1, 1994 through January 31, 1995. 2.) Amplifiers submitted for refund must be intact. Units with parts missing will not be accepted for refund. 3.) To qualify for a refund, amplifiers must be delivered to QMI with complete documentation (a completed warranty card and copy of Genelec 1030A sales receipt) before February 10, 1995. 4.) The Genelec 1030A's must be purchased from an authorized Genelec dealer within the United States (call QMI for dealers in your area, (508) 435-3666). 5.) Only one (1) \$200 refund for each pair of Genelec 1030A's purchased. 6.) All amplifiers must be shipped freight prepaid. Freight collect or COD's will not be accepted. 7.) Please allow 4-6 weeks for delivery of refund check.

QMI 25 South Street, Hopkinton, MA 01748 Tel: (508) 435-3666 Fax: (508) 435-4243



WELL BALANCED

The new Ramsa WS-A35 nearfield, two-way compact monitor is designed to perform in a variety of studio applications. Ramsa's spherical waveguide design provides smooth, accurate, well-balanced, and controllable sound in the mid- and high-frequency ranges. Magnetic shielding allows for use in close proximity to a video monitor. For more details, contact Ramsa/Panasonic, 6550 Katella Ave., Cypress, CA 90630. Tel: 714-373-7277. Circle EQ free lit. #124.



MORE POWERFUL THAN A LOCOMOTIVE...

The new Roland JV-1080 Super JV Synthesizer module provides 64-voice polyphony and 16-part multitimbral capabilities. Expansion capabilities are plentiful: up to four simultaneous wave expansion boards and one wave card from the JV-Series. Immense waveforms combine with an array of sound structures and onboard multiple effects. The 64-voice polyphony and 16-part multitimbral capabilities are bolstered by a 32-bit RISC-chip CPU that provides extreme speed, accuracy, and natural response to performance. As with all JV expandable synths, the ability to augment

the module is a primary feature. The JV-1080 is expandable up to 42 MB. Four SR-JV80 Series wave expansion boards of 8 MB each can be simultaneously accommodated for instant access to thousands of patches from various musical genres. Along with built-in reverb and chorus, 40 insert effects are available. The JV-1080 Super JV retails for \$1695. For further information, contact Roland, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: 213-685-5141. Circle EQ free lit. #125.



Cost-Effective Studio Furniture That Looks Like A Million



MIXRAK studio furniture offers extremely high quality racks and desks at a very affordable price. Perfect for production and home recording applications, MIXRAK's modular design allows a customized system to be quickly and easily assembled.

Available in a variety of heights, sizes and in black or computer grey, the furniture's surface is well protected with melaface and high pressure laminate. A solid oak strip edges the parameter of the desk, while durable, high-impact T-molding protects all other edges. MIXRAK also features heavy threaded rack railing that insures the proper and safe alignment of electronic equipment.

There are no limits to the possibilities that MIXRAK provides. From the simplest workstation to the professional recording/production studio, MIXRAK's modular construction accommodates any application. For additional information, contact Larry Truman at (219) 233-4151.



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- MIDI Chord recognition

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The Studio 5000 takes its predecessor, the amazing DHP-55, a step further. With new features and programs crafted by studio pros, the Studio 5000 is sure to stir your creative urges. Here's what the people who make their living in the studio have to say about it.



"I immediately started doing things I never was able to do with my other processors"

KIM BULLARD

Excellent Pitch Shifting

John Ross, President of LA's Digital Sound and Picture needs quality pitch shifting for Foley without the artifacts of competitor's products: "... the 5000 sounds natural, just like 2 inch tape at half speed. We require high quality products for simple applications. The Studio 5000 fits in very well indeed."

Digital Sound and Picture is an advanced facility using a Lan-based digital audio network and multiple digital audio workstations.

Sweeten Mixes, Add Depth

Five time Emmy award winning composer and producer Dominic Messinger says the Studio 5000 "makes the normal exotic". He uses it to sweeten mixes by using the regenerative pitch shifting Mix Imager programs. On drums he adds depth with detuning and dynamic filtering effects.



"It's like getting a whole new set of presets for your instrument"

DOMINIC MESSINGER,
5 TIME EMMY AWARD-
WINNER, COMPOSER
& PRODUCER

Creative Control

Clif Brigden, engineer for Thomas Dolby uses the Studio 5000 on Dolby's upcoming album and interactive video projects. "It sounds wicked right out of the box but lets you get to and change every parameter to make your own unique noises."

Leading Edge Special Effects

The Studio 5000 adds a futuristic edge to new animated series 'Phantom 2040'. Producer/composer Gerald O'Brien explains: "The 5000's Lush Chord Shifting algorithm is used on the main theme vocals

"It will be an indispensable product for musicians and engineers."

DHP-55 review

SOUND AND
RECORDING
MAGAZINE,
JAPAN

while guitar and bass tracks get cabinet emulation and special effects. The robot voices are created using combinations of pitch shifting, flange and chorus." Gerald has scored over 22 shows including the successful



"Imagine what music will sound like in 40 years - that's what we're working to create."

GERALD O'BRIEN

Cobra series. His songwriting clients include Manhattan Transfer, Hall and Oates and Deborah Harry.

Guitar Effects

"They asked for a Jimi Hendrix type cue to go with a 60's acid experience... I quickly called up the Voodoo Wah program... and they loved it!" Larry Brown, TV composer, producer and Emmy winner uses the Studio 5000 to closely emulate guitars with his synthesizers.

Fast

"I have to write a lot of music in a short period of time and the Studio 5000 really helps me to achieve that" says Kim Bullard, writer, producer and session musician. He's using the Studio 5000 to help create the soundtrack for the upcoming film, 'Taxandria.'



"Sounds so deep, I'm still looking for the bottom."

CLIF BRIGDEN,
ENGINEER FOR
THOMAS DOLBY

Record Quality

The Studio 5000 gives Kim Bullard the detailed sound he demands. "A soundtrack album is also part of the Taxandria project so the cues have to be record quality" he says.

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Digitech

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COMING UP IN

EQ

JANUARY 1995

BABY, IT'S COLD OUTSIDE...but it's red hot in the indoor arenas and clubs. Find out what's going on in sound reinforcement during the frigid months in our Winter Live Sound Special. Sneak around backstage at the Late Show with David Letterman, take a look at a multimedia concert, check out the hot live-sound intros that were made at AES, and more.

GET ON THE BUS. The 8-bus, that is. And if you have any questions regarding these popular mixers, then EQ's 8-bus section is for you. Learn the who's, the what's, and the why's in this special report that includes reviews of many of the boards you've been hearing about.

WE BLUE IT! It's time again for EQ's tribute to the outstanding new products introduced at the AES. Find out what was bestowed a coveted blue ribbon in this product spotlight.

TO BE A PART OF THIS EXCITING ISSUE, CONTACT:

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PRO VERB

The Boss RV-70 can free up your multieffects for other chores. The unit utilizes 16-bit digital processing at 44.1 kHz to produce high-density effects. Many of the parameters are directly accessible and easily edited from the front-panel controls. The RV-70 is completely MIDI compatible. Retail price is \$499. For more information, contact Roland, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: 213-685-5141. Circle EQ free lit. #126.



JUST GETTING WARMED UP

The RSP Technologies Saturator is specifically designed to provide warmth for digital recording. The Saturator's 12AX7 tubes combine with proprietary circuitry to create the classic saturation curves and midrange presence of hot signal-level analog recording, while allowing you to retain the benefits of the digital medium. The dual-channel, two-space unit is patent pending. Each channel features drive and output controls, XLR and 1/4-inch ins and outs, and a VU meter that is switchable between saturation and output levels. The Saturator is intended for use at a mixer's master insert points during mix-down or on individual signal channel inserts. Retail price is \$699. For more information, contact RSP Technologies, 2870 Technology Dr., Rochester Hills, MI 48309. Tel: 810-853-3055. Circle EQ free lit. #127.



HOT AND HEAVY

Hot House Professional Audio is introducing the culmination of nearly three years of R&D in its new High Output Series Monitors and High Impact Subwoofer. These high-performance speakers are targeted to accommodate the demands of rap, hip-hop, dance, and R&B control rooms. Even though the full-range SD312 and AB412 subwoofer can generate the highest full-bandwidth SPL of any monitor system available (approaching 150 dB with 20,000 watts of Hot House high-current audiophile amplification), its inherent point source transparency provides the resolution required for more subtle work at lower levels, while the 12-inch woofers maintain low-frequency response to below 30 Hz. For more information, contact Hot House, 275 Martin Ave., Highland, NY 12528. Tel: 914-691-6077. Circle EQ free lit. #128.

Two Amazing Things Happened in 1994

1

The King of Pop Married the Princess of Rock

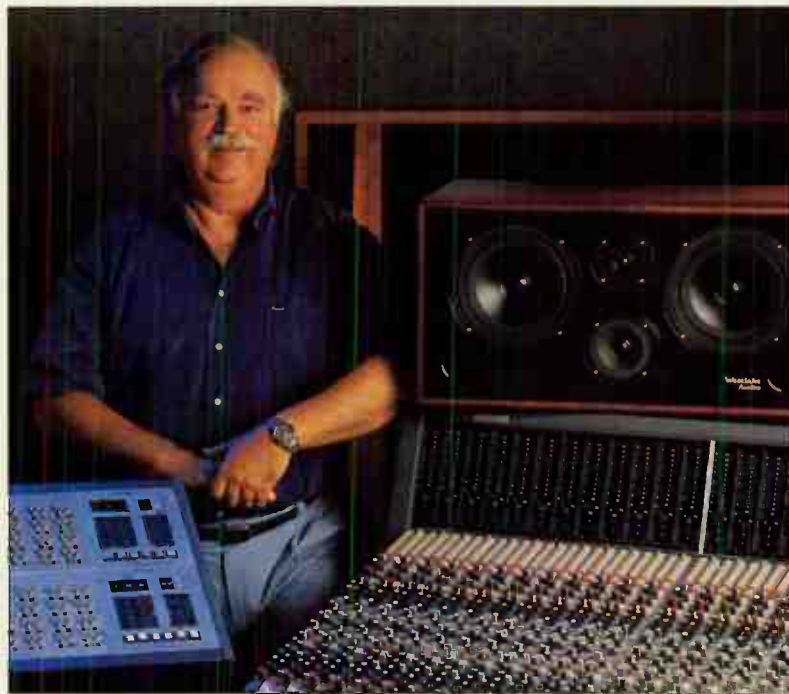
2

Bruce Swedien Switched from JBL 4310's to Westlake Audio BBSM-8's

Before spending money on yet another pair of the latest "premium" monitors, invest an hour of your time auditioning a pair of Westlake Audio BBSM Series monitors.

Bruce Swedien did. After 25 years of hard studio use, Bruce retired his trusted pair of JBL 4310's for a pair of BBSM-8's.

To hear a true reference monitor, call your local pro audio dealer for an audition.



Bruce Swedien on Location at the Hit Factory, New York

"These are the first monitors I've been able to spend a lot of time with and be comfortable at the end of the day. The detail is simply great!"

- Bruce Swedien on BBSM-8 monitors.

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74 DECEMBER EQ



DO MORE DIGITAL

DB Technologies is introducing the dB3000 digital optimizer, a sample rate/data format conversion, monitoring, and measurement device. The dB3000 provides sample rate conversion, bit reduction, optimized digital transfers, jitter removal, calibration, troubleshooting, and multimedia developer's tools. For more info, contact dB Technologies, 1155 N. La Brea Ave., Hollywood, CA 90038. Tel: 213-845-1155. Circle EQ free lit. #129.

BAYWATCH WITHOUT BIKINIS

The BayWatcher is called a patchbay monitor and recall system. It's a complete stand-alone system for the monitoring and recording of patches in today's complex patchbay systems. BayWatcher actually monitors each patch as you make it and automatically stores that patch information for later recall. BayWatcher automatically prompts you through a repatch with the LEDs located on each jack, as well as by voice and digital displays. In addition, the BayWatcher ALARM feature monitors the bay for illegal operations. For complete details, contact BayWatcher, 7755 Alabama, Ste. 12, Canoga Pk., CA 91304. Tel: 213-256-4048. Circle EQ free lit. #130.



READY, AIM, ATAC

T.c. electronic is showing three new M5000-based products at AES. Two are software upgrades and the third is an all-new hardware option. It's called ATAC, and offers M5000 users a new approach to programming. In addition, an expanded MD2 mastering package is now available. Also, t.c. is offering a free 4-band EQ as an upgrade to all M5000 owners. For more details, contact t.c. electronic, 705 Lakefield Rd., Ste. A, Westlake Village, CA 91361. Tel: 805-373-1828. Circle EQ free lit. #131.

CAUSE OF EFFECTS

Lexicon's PCM-80 is a true stereo effects unit, with digital and balanced analog interfaces, high-performance 18-bit conversion, and a 24-bit internal digital bus. Digital and analog inputs can be mixed together. Lexicon's proprietary dual-DSP hardware platform is unique. It includes the Lexichip II, which is the latest generation of Lexicon's proprietary VLSI chip and optimized for reverb programs. In addition, the Lexichip is supported by the Motorola 56002 chip, a powerful general-purpose DSP engine in its own right. A proprietary digital audio and control bus links the two chips, controlled by another custom Lexicon chip. The PCM-80 ships with 200 presets that cover a wide range of applications. For complete details, contact Lexicon, 100 Beaver St., Waltham, MA 02154-8425. Tel: 617-736-0300. Circle EQ free lit. #132.





CHARLES THE MIXOLOGIST ROANE

D.C.'s hot urban contemporary station WPGC got its current #1 market standing by doing risky, innovative things. Like hiring Charles "The Mixologist" Roane & his trusty CR-1604. Roane's remix of "Whomp (There it is)" helped spur total sales of the single to over 6 million — making it the

all time best selling rap record. Now record labels seek out The Mixologist for his "flava" and clean mixes.

Though he recently bought a Mackie 32•8 8•Bus console, Charles won't part with the CR-1604 that got him started. He calls it his "lucky mixer."

WHY PROS PREFER MACKIE... PART THREE



MACKIE REMIX MASTERS

BONZAI JIM CARUSO

Ever since he engineered five remixes on Madonna's smash "Erotica" album, Bonzai Jim Caruso's engineering career has been on fast forward. As he did on the Madonna sessions, he usually brings along his personal CR-1604 mixers.

The rest of Bonzai's resume speaks for itself: top-charted dance remixes for George Michael, Luther Vandross, Jon Secada, Gloria Estefan, The Basement Boyz, Natalie Cole, Class-X with Michelle Weeks and Jose Feliciano. All mixed on two Mackie CR-1604s.

Now let Bonzai speak: "I went through four other small mixers* before finding the Mackie. The others didn't even come

close. The CR-1604 is the only mixer that can handle really huge drum sounds, monstrously fat bass and a ton of synths simultaneously."

Recently, while mixing Crystal (La-Da-Di La-Di-Do) Waters at the Basement Boyz' Baltimore studio, the SSL console didn't have enough inputs. So Bonzai rented a CR-1604 to help mix two cuts, "Ghetto Days" and "What I Need." The studio was so impressed with the Mackie CR-1604 that they immediately bought two!

Bonzai then used those two CR-1604s to mix Martha Wash's new remix album release "Leave A Life On" — sans help from the SSL board.

MACKIE.

All of our mixers are made at 20205 144th Ave NE, Woodinville, WA, 98072, USA • For more info, call 800/268-6883 M-F, 9 to 5 PM PT • FAX 206/487-4337
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*Although Bonzai specifically listed the other brands he'd tried and rejected, we don't mention direct competitors in our ads. If you want a hint, though, see who else is advertising compact mixers in this issue.

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SEE US AT AES BOOTH #1835



A BIT LESS

New from Apogee Electronics is the UV1000 Super CD

Encoding System, which includes Apogee's UV22 process for reducing high-resolution sources onto 16-bit formats such as CDs. Apogee's UV22 adds an inaudible, high-frequency bias to the digital bit stream, placing an algorithmically generated "clump" of energy around 22 kHz. UV22 silently captures resolution beyond 20 bits on a standard 16-bit CD. The UV1000 processor includes UV22 Processing, AutoBlack, DC offset removal system, NOVA ("No Overs"), Oscillator, AES, S/PDIF, SDIF, ST, Optical, TOSLINK, and SDIF-II inputs. For further information, contact Apogee Electronics, 33145 Donald Douglas Loop S., Santa Monica, CA 90405. Tel: 310-915-1000. Circle EQ free lit. #133.



MAIN SQUEEZE

Symetrix has introduced the 488 DYNA-Squeeze, an 8-channel compressor/interface for use with digital recorders. The 488 DYNA-Squeeze allows you to optimize recording levels and "push" more information into the recorder's dynamic acceptance window while providing eight channels of level matching interface (+4 dBu to -10 dBu). The unit helps prevent the A/D converters from clipping, accomplishing this by controlling levels that are too high, allowing more signal to be pushed toward the recorder for optimum recording volume. Levels that are too low fall into the digital noise range and can be recorded with resolutions as low as 4-bit. This combination of compression and level matching allows the console to be run at higher-than-average levels. Retail price is \$579. For more details, contact Symetrix, 14926 35th Ave. W., Lynnwood, WA 98037. Tel: 206-787-3222. Circle EQ free lit. #134.



GET IN LINE

TimeLine Vista is introducing a major upgrade to its Studioframe Series of workstations. The Studioframe now offers 24 tracks of digital recording, up from eight. The upgrade integrates with the entire Studioframe system, including the onboard mixer. The Studioframe DAW-80 incorporates technology that is based on the industry-standard Intel/Windows platform. In addition to the 24-track upgrade, TimeLine is offering a number of other new products designed to enhance the performance capabilities of the DAW-80 system. These include an edit controller, Version 6.0 software that features Play Reverse With Lock, and the Mediasound editing software — the first software program to offer multitrack editing that runs native on Silicon Graphics workstations. For further information, contact TimeLine Vista, 2401 Dogwood Way, Vista, CA 92083. Tel: 619-727-3300. Circle EQ free lit. #135.



CAN SEE IT COMING

Otari has begun shipping RADAR (Random Access Digital Audio Recorder). In one 40-pound rack-mountable unit, RADAR offers 24 tracks of hard-disk recording. RADAR is available in 8-, 16- and 24-track



configurations. The 8- and 16-track versions are expandable with 8-track upgrades to 24 tracks. The optional remote is fully functional with 99 cue points, a jog/shuttle dial, a number and QWERTY keyboard, track keys for arming and soloing, and dedicated function keys. For more details, contact Otari, 378 Vintage Pk. Dr., Foster City, CA 94404. Tel: 415-341-5900. Circle EQ free lit. #136.

X MARKS THE SPOT

Furman Sound has introduced three X-Series 24-dB-per-octave electronic crossovers. The units employ Linkwitz-Riley/Butterworth slope switches to optimize performance for either nearfield or farfield applications, and individual screwdriver-adjustable peak limiters on each output. Mute, phase reverse, and horn EQ switches with LED indicators, and detented frequency pots with X1/X10 range switches simplify and add repeatability to the setup process. Low sum-to-mono switches allow running the lowest outputs in mono or stereo. Prices are \$439, \$599, and \$699, respectively. A fourth model, the X-312, is a low-cost stereo 2-way, mono 3-way, 12 dB/octave unit. (\$279). For more info, contact Furman, 30 Rich St., Greenbrae, CA 94904. Tel: 415-927-1225. Circle EQ free lit. #137.





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 you were using just
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thing you'll do is contact BASF, 1-800-225-4350 (Fax: 1-800-446-BASF); Canada 1-800-661-8273.

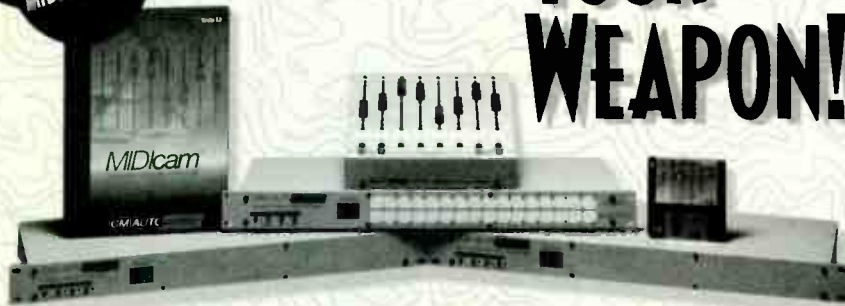
of BASF 911. Low rub off. Precision-manufactured. It's classic BASF. The kind of BASF tape studios have been relying on since 1934. As you turn to face the band (gulp), you make a vow. If you survive the next ten minutes, the first

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AES LATE NEWS

• Gossip from Europe has it that **Sony** has announced that it is ready to enter the world of Modular Digital Multitracks. A licensing agreement has been reached between Sony and **Tascam** that will allow Sony to manufacture 8-track digital tape machines using the technology that Tascam has implemented in the DA-88 machine. This move will surely strengthen the position of the Hi8 format against the S-VHS format currently supported by Alesis and Fostex.

• Also from Europe, **Fostex** is making news with the introduction of a low-cost version of the Foundation 2000 digital audio workstation. The 2000LS is a full-featured, 8-track digital recorder/editor that is targeted at the project studio and broadcast markets. The 2000LS can be offered at a lower price than the 2000 because a number of features that are standard on the 2000 — such as synchronization, machine control, digital mixing, and digital signal processing — are available as options on the 2000LS, allowing the user to purchase only those options necessary for their particular application. The 2000LS is designed to be priced competitively with Digidesign's Session 8, and can be upgraded to a full Foundation 2000 at any time.

• Japanese ears reveal that **Pioneer Electronics** has announced the D-9601, a DAT recorder/player utilizing a sample rate of 96 kHz. The unit was designed to satisfy professional users and audiophiles who want a wider frequency range than available in digital recorders that sample at lower rates. The frequency range of the D-9601 extends from 2 Hz up to 44 kHz, and the machine uses high-speed, one-bit digital-to-analog conversion. Pioneer maintains that the unit's increased sample rate reproduces the harmonic components originally contained in music, and provides a transparent, dynamic, and more natural sound quality.

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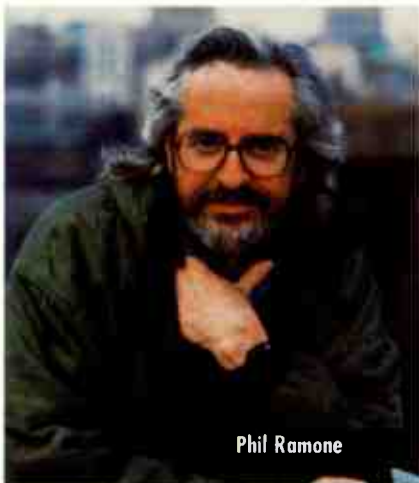


1995 PREVIEW EQ PEOPLE

EQ 2nd Annual People of the Year

Once again you ask, "What's our criteria for the following list?" Once again we reply, "We don't have any." We asked our contributors for some help, but when you get right down to it, any list of the project recording and sound power brokers is going to be subjective, right? So why pretend otherwise. Here's our list. Go ahead and write your letters.

PHIL RAMONE He's been up and he's been down, but he's back on top of the record production business in a very big way, thanks to a large part to his pioneering *Duets* recordings with Frank Sinatra, utilizing ISDN technology. Add to this his work with Stephen Sondheim's *Passion* and Gloria Estefan and the Tascam DA-88.



Phil Ramone



Bruce Jackson

BRUCE JACKSON He gets our kudos for two reasons: (a) because his 20-bit processor has changed the mastering world; (b) because his sound reinforcement chops brought Barbra Streisand back on stage. We call that a one-two punch that can't be beat. Even *TV Guide* spilled ink writing about how much Bruce made a difference.

HARRY SUZUKI & the Yamaha ProMix 01 Design Team. Everybody knew that Yamaha had the smarts. But what have they been doing since the DX-7 took the world by storm? Obviously they've been dreaming up the world of affordable digital

mixing, which premiered this year and promises to change the way mixes are made from the project to the commercial studio. Bravo.

BOB CLEARMOUNTAIN

Shhhhh. The word has been ever so silently spreading (especially since *Billboard* broke the story) that this megamixer has built his own basement project studio in the L.A. area. It's not so hush-hush anymore, even though Bob hasn't yet showcased his space to the world at large. FedEx can haul the masters and Bob can have some peace and quiet. So listen HARP — leave this guy alone.

SCOTT SILFVAST, president of Euphonix and designer of its console. The board has created a new level of project studio for the likes of Herbie Hancock, Hans Zimmer, and Ice T. And with an installation at the Record Plant in L.A., we're starting to see a pattern for coexistence between project studios and project-studio-compatible commercial studios that may be the wave of the future. Sure it's pricey. But then again, who said a project studio couldn't be pricey?



Scott Silfvast

Our second annual, subjective, unscientific, and biased choice of those audio pros who defined the burgeoning project studio marketplace circa AES 1994 (in no particular order)

HONORABLE MENTIONS

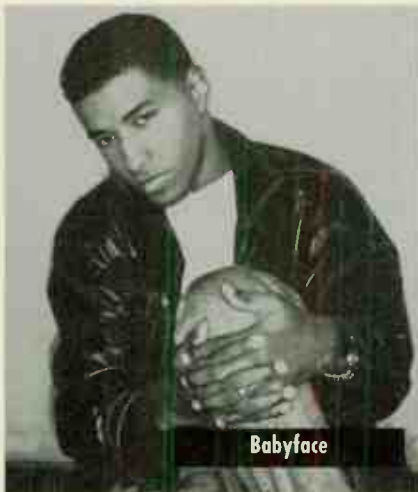
We promised to keep the list to only ten people, but we can't help mentioning a few more names... **Don Plunkett**, executive director of the AES, has built the association and the trade shows to positions of worldwide prominence...

Thomas Dolby's soundtrack to the Miramar video "The Gate to The Mind's

Eye" sets a new standard for audio-for-multimedia, and his visits to Washington to discuss copyrights will benefit multimedia artists everywhere... And we can't ignore **Russell Palmer and Keith Barr** whose introduction of the X2 console and Monitor One monitors complete the Dream Studio that has built upon the continuing success of the ADAT... While we're at it, let's not forget **Peter Gotcher** at Digidesign which continues to pave the way the pro audio and computer businesses will interact. And now, with the Avid Technology merger, Digidesign will become an important part of digital video as well.



FROM LEFT TO RIGHT: Peter Gotcher, Thomas Dolby, and Don Plunkett.



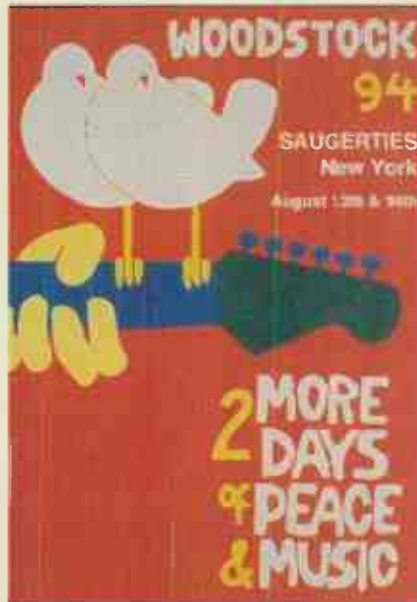
Babyface

BABYFACE He's now building a major project studio in L.A. and the Boyz II Men album he produced is adding to his reputation for musical success. Any producer who commits his money to multitrack deserves our recognition and congratulations.

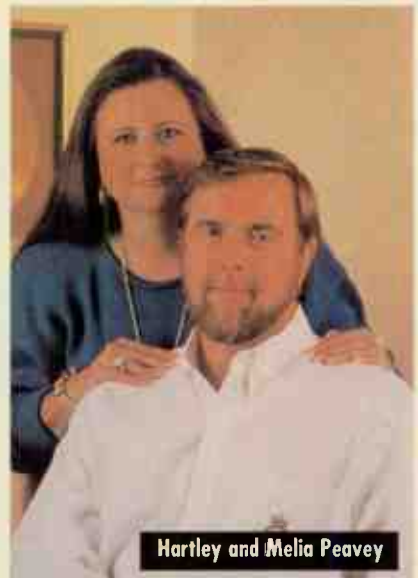


Mike Frondelli

WOODSTOCK '94 The people who really deserved all the credit were the team of sound professionals that pulled off one of the great sound-reinforcement feats of all time. More people. More mud. More bands. More media. More headaches than 25 years earlier. Great sound.



MIKE FRONDELLI Frondelli, the director of creative services at Capitol Records, has issued a blueprint for how a major record label can achieve maximum creativity and efficiency by building project rooms to complement the studios in the famed Tower. The Mackie/ADAT rooms he's designed should set his boss, Charlie Koppelman, to thinking about ways to change the international EMI recording infrastructure.



Hartley and Melia Peavey

THE PEAVEYS Hartley and Melia Peavey, the mom and pop shop of American music manufacturing, has taken the pro business by storm. Their MediaMatrix is one of the most ambitious projects to be announced in years. And the company they have created in under 30 years still sets a standard for American pro audio manufacturing.

FRANK ZAPPA A true recording and musical pioneer who will be forever remembered for having changed the rules for project recording and for defending our artistic rights. He had one of the first artist-owned creative studios; he was a leader in digital technology, and was one of the world's foremost composers. One thing is for sure: He will never be forgotten. May he rest in peace. **EQ**

The first random
access Q&A, as
engineered and
automated by
Roger Nichols

Walter _ Be
Artificial



cker: \>

Interview

In preparation for the fall '94 release of *11 Tracks of Whack*, Walter Becker's long-awaited solo album, a punishing interview schedule was laid out for the months of August and September, during which time newspaper music editors from all over this great land of ours would each have their turn to ask the artist 20 to 30 minutes worth of questions

about his new career, his new album, this summer's Steely Dan tour, Donald Fagen, or whatever. For the most part, these interviews were scheduled to coincide with the tour; thus they had to be squeezed in between shows and airplane flights and days off, making them doubly irritating to the hapless Becker. Plus, as the first week of interviews clearly showed, most of the writers will ask a completely predictable series of questions that could easily be anticipated, but that had to be answered completely and honestly every single time. After a couple of sour sessions during which Becker consistently taunted and lied to his unfortunate interlocutor, he conceived of a brilliant alternative format that would provide consistently high-quality interviews, no two quite the same, and

that would free him from participating in these grueling sessions. After describing his scheme to longtime pal and engineer Roger Nichols, the digital maven agreed to build Becker the interview system of his dreams based on a Mac PowerBook and a cellular phone. Here's how it works:

A Journalist dials the supplied cellular phone number at the appointed hour. The line picks up and he hears: **Robovoice:** Welcome to the Walter Becker *11 Tracks of Whack* interview. Answers to the most commonly asked questions have been prerecorded for your journalistic convenience. If you would like to know why Walter Becker waited so long to record his first solo album, press 1 on your touch-tone phone now.

Journalist: Presses 1.

Voice of Walter Becker: Well, I guess that through the '70s, when Donald and I were making Steely Dan records, I felt that Steely Dan was an utterly sufficient outlet for my creative talents, such as they were. Later on, when we finished *Gaucho*, Donald and I decided to go our separate ways for any number of valid reasons, and I myself felt that I was the victim of a typical career burnout and that I needed to do something different for a while. So I moved to Hawaii and didn't work in the music business for a couple of years. When I decided to go back to work, I wanted to keep my time commitment to working limited to a couple of months at a time, and I wanted to function in a role where I could forget about work completely when I came home, so I started producing records. I picked projects where I knew the length of the project would run no more than two or three months. I was successful in this way for a number of years. But after a while I found that I wasn't satisfied with the producer's role, and I decided to write some music and make my own record.

Voice of Roger Nichols: This is Roger Nichols, chief engineer for Fagen's albums and also designer and builder of this automated interactive interview, and I will be making comments or clarifications from time to time, as a supplement to Walter's prerecorded answers. As far as I can tell, the real reason Walter decided to make a record was so he could drag me and a bunch of great musicians over to Hawaii and make us admire and use all of his gear, of which he's got a hell of a lot, most of which he doesn't even know how it works or, in some cases, what it's for. That's why he got a record deal and made this record.

Robovoice: If you would like to know why *11 Tracks of Whack* has 12 songs, press 2 now.

Journalist: Presses 2.

WB: Just a joke, really...think of it as a clerical error in your favor.

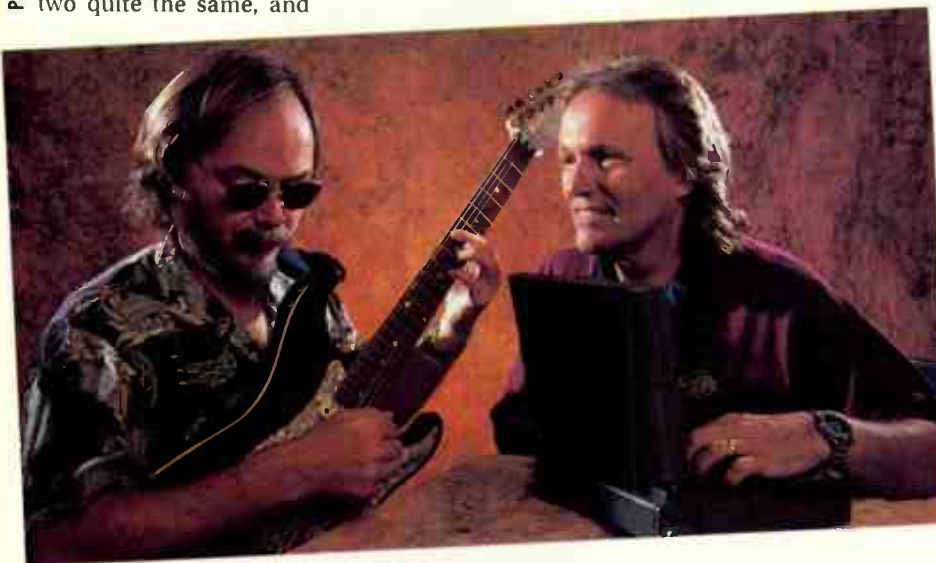
Robo: If you would like to ask Walter what it was like writing songs by himself, without Donald, press 3 now.

Journalist: Presses 3.

WB: Well, it was lonely. But it got a little better as I went along, especially after I started calling the computer "Donald."

RN: He made me go into ResEdit and change the name of "Vision 1.4" to

Photos by Deborah Gray Mitchell



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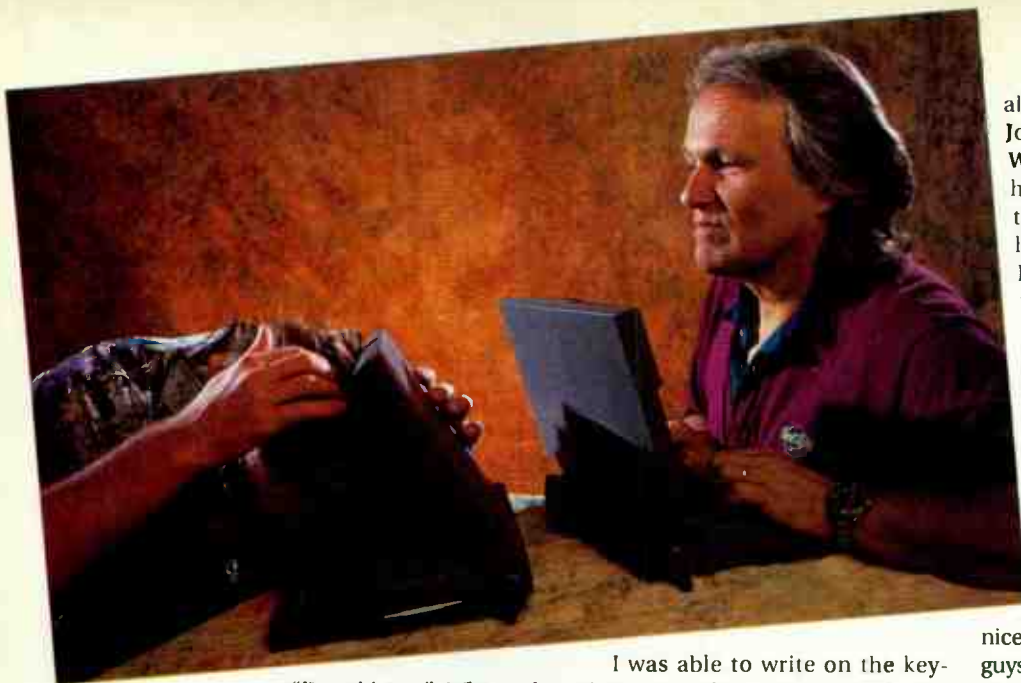
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World Radio History
Suggested list price for Topaz 24-channel, \$3,995; Topaz 32-channel, \$4,995. Soundtracs is exclusively distributed in the U.S. by Samson Technologies Corp.



“Donald 1.4.” What a jerk. He made me change the icon too. By the way, Walter doesn’t know that I put these comments into the computer, so if you quote me in the piece it’ll be a wonderful surprise for him when it comes out.

Robo: If you want to know how long it took to make the album, press 4 now.

Journalist: Presses 4.

WB: I guess it took about 18 months, with a couple of breaks for Steely Dan tours. I had originally hoped it would go much quicker, but you know what? It didn’t.

RN: How could it? We’d work on a track for maybe a couple of weeks, then Walter would decide he didn’t like the song anyway. He’d make me time shift hundreds of high-hat notes in SoundTools, he’d get bored way before I was finished and go home, then he’d never listen to that track again. Every time he had to add anything with his synths, he’d have to look it up in the manual, which as often as not he had left at his house — 45 minutes away from the studio.

Robo: If you want to ask Walter if any of the new technology changed the way he worked on his album, as compared to the Steely Dan days, press 5 now.

Journalist: Presses 5.

WB: I would have to say that the most important difference had to do with writing on the computer. Because of the possibilities for manipulating the MIDI data on the sequencer program,

I was able to write on the keyboard in a much more sophisticated way than would have been possible without it. I was able to maximize the effectiveness of my decidedly meager skills as a keyboard player and thus develop harmonic ideas that I would not have come up with on the guitar.

RN: And which is why Walter, when he was asked by musicians what the chords to his songs were, had to go to the sequence and look at the MIDI notes on the tracks to figure out what was going on. Which is why nobody could agree what the correct names and chord functions of these bizarre clusters were, or even what key they were in, or in some cases where “1” was.

WB: Another big difference was that, back in the ‘70s, our big problem was trying to get the tracks with live musicians to be steadier and more mechanically perfect and so on — whereas now, the big problem is trying to get the machine tracks to be more natural sounding and have more of the feel and variation of tracks played by real musicians.

RN: Some people can’t be helped by technology — or by anything else for that matter. They just like to complain.

Robo: If you would like to find out why Walter’s considerable talents as a vocalist have remained hidden until now, press 6 now.

Journalist: Pause...

Robo: If you want to ask Walter if there is ever going to be another Steely Dan

album, press 7 now.

Journalist: Presses 7, enthusiastically.

WB: Well you know, Donald and I have been working together a lot in these last couple of years and we’ve been thinking that we...

RN: This is sys op Roger Nichols, and I would like to interrupt Walter’s answer here for a moment to take a short and scientific survey. The question is this: Let’s say you have a couple of guys who have been working together off and on for 20-plus years, and these guys have been pretty successful with their recordings, both artistically and, well, financially — I mean they’ve got plenty of dough and nice houses and cars and nice vacation houses that also have cars,

nice cars that is, and let’s say these two guys owe their artistic and, uh, financial success in no small measure to their brilliant and loyal recording engineer, who through the years has devoted most of his time and energy to their albums, has built all kinds of cool stuff for them — computers and whatnot — without which they could not have done a lot of what they did...and let’s say that this guy has been paid right along for his time and so on, but when you look at what’s involved and how much these records have earned over the years, his salary, which he already spent years ago, looks like peanuts compared to the big picture. So the question is this: What would be an appropriate bonus for these two songwriter guys to give their loyal tech guy, as an acknowledgment of his 20-plus years of loyal brilliance? This is, mind you, coming on the heels of an extremely lucrative summer tour and all. If you think the appropriate bonus would be a nice Lexus ES 300, just like the one Walter’s got in Hawaii, press 1. If you think this guy should get a poke in the eye with a sharp stick, press 2. If you think he deserves all of the above, press 3.

Journalist: Presses 2.

RN: I hope you’re not expecting to hear any more of Walter’s answers...

Journalist: Presses 1.

RN: Good. Now let’s see what Walter was saying about that new Steely Dan album.

WB: [in mid sentence] ...so I guess that’s what we’re gonna do. Maybe. Or, you know, maybe not.

Journalist: Hangs up.



Walter made me go into ResEdit and change the name of “Vision 1.4” to “Donald 1.4.” What a jerk.



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YAMAHA PROMIX 01



THE RO

What the hell

is the dang deal here? Every magazine I pick up has a review of the Yamaha ProMix 01. Every review says basically that the new Yamaha board is the best thing since sliced bread. Every reviewer says that if you don't buy one of these for your studio, your projects will sound inferior. They all say that having one or more of these boards will increase your productivity by about a billion percent. Has Yamaha paid all these reviewers off? Has payola surfaced in the equipment review business? Are they all crazy?

Well, they are not crazy, and Yamaha didn't have to pay them because Yamaha has done it again, just as it did in the early '80s with the DX-7 keyboard. It has created a cool piece of gear that does more, does it better, and costs less. It has built a product that can be used in the project studio or in the high-ticket studio without sacrificing quality.

The world's first affordable digital mixer put to the test

GER NICHOLS REVIEW

THE YAMAHA PROMIX 01 REVIEW

The ProMix 01 is a 16-input (18 if you count the stereo input usually used for cascading multiple mixers), two-output, digital mixing console with two built-in stereo digital effects processors, three stereo dynamics processors, and fully parametric 3-band EQ. The A/D converters are 20-bit with 64 times oversampling. There are four aux sends for effects (two dedicated to the internal effects and two for external effects). Just to make it easier to use, the motorized faders can be grouped together (four groups are available) or linked in stereo pairs. Besides the 2-channel, main analog 20-bit 8 times oversampling output, there is a consumer format digital output that can be connected directly to a DAT machine or through the proper converter to an Alesis ADAT or Tascam DA-88. Phantom power is available on the first eight inputs, which are XLR connectors. Because of space limitations, the next eight inputs are on 1/4-inch balanced phone jacks.

Well, that about covers it. Go out and get one and I will see you next month. (Those of you who know I'm just kidding can continue reading.)

A lot of people have complained that the ProMix 01 should have been equipped with digital inputs for connection to ADAT and DA-88 digital machines. I discussed this matter with Yamaha and they said that the addition of digital inputs could have raised the price significantly. And which input format should Yamaha have used: ADAT, DA-88, SDIF-II, or WHAT'S-THE-DIF? I think it made the right decision to keep the price down and get millions of the units out there, and maybe come out with a more expensive digital input version later.

If you were keeping notes during

my reviews of the ADAT and Tascam digital machines, you know that I bounced tracks *analogly* (is that a word?) until my brains fell out, without any real degradation in the audio quality. As far as I am concerned, you won't be losing enough to make any difference in your audio quality by going analog between your 8-track digital machine and your ProMix 01. At least this is my official position until the digital input version shows up. Then, of course, I will try to convince you that the analog input version isn't worth copying answering machine messages with, and that you should get the new one. But for now, pretend that I'm not going to do that.

Above all, the ProMix 01 sounds good, even when four of them are cascaded together using analog connections. I know, because this is the configuration I used on the Steely Dan tour this last summer. I had twelve inputs from a Sony 3348 48-track digital machine connected analog to each of four ProMix 01's. The stereo output of the first mixer was routed to a pair of inputs on the next mixer. This stereo signal was then mixed with 12 additional inputs and routed to the next mixer. By the end of the chain, the first 12 inputs have been back and forth between digital and analog four times. It sounded absolutely fine. I have tested this routing path with my trusty Meyer SIM machine and have included the trace in fig. 1. Notice that the frequency response is down 0.8 dB at 22,226 Hz and that the Signal/Noise ratio has deteriorated to only 100 dB. So what's the big deal? I guess project studios don't always "have to stay digital" to sound good.

INTERNAL EFFECTS

The two internal effects units remind me of the new Yamaha SPX-990. The

effects programs are useful and also sound very good. For the Steely Dan tour, I wanted to add a little bit of ambiance just to soften the close-miking side effects. Usually when you find the right effect to use and then turn it down, it just seems to add noise or graininess to the original sound. Good-sounding effects processors that sound good when turned down low are usually very expensive. The SPX-990 and the effects processors in the ProMix 01 are exceptions to that rule.

Parameter settings and effect selection are performed by use of the parameter wheel and the LCD display. Effects and parameters may also be changed via MIDI from an external control source. There are 30 different factory presets and room to store 10 user programs.

DYNAMICS PROCESSORS

The three stereo dynamics processors can be assigned to any of the input channels, the stereo output, or the aux sends. They can be used for gating, ducking, limiting, and compressing. I used two of the processors for gating the kick and snare. I used the third one for limiting peaks on the lead vocal, but don't tell anybody. There are 10 preset programs and space for 10 user programs.

EQ

The digital domain EQ sounds good, and it does exactly what it says it is going to do. I like digital EQ the most when I have to brighten a vocal. If you have a vocal that tends to be sibilant, then analog EQ only tends to exacerbate the situation. Digital EQ has less phase shift and therefore allows you to crank the high end (notice I said you,



WELL CONNECTED: The ProMix 01 has lots of inputs, but no digital ones.

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92 DECEMBER EQ

THE YAMAHA PROMIX 01 REVIEW

not me) without making the esses tear your tweeters out by the roots.

There is a library of preset EQs for those of you who would rather just select "Kick Drum" or "Toms" than try things from scratch. As with other settings, there are 30 preset EQ programs and space for 20 user programs.

MOVING FADERS

How about that? Nineteen moving faders and a digital console with built-in effects for less than the price of two moving faders on an SSL or Neve. Pretty good deal. Remember, since audio does not pass through the faders, you don't have to have the same quality of fader as you do with a Neve or SSL. The faders just supply data to the digital audio DSP telling it how much to turn up the gain.

The moving faders are used to set multiple parameters. When SEND 1 is selected, all of the faders move to the proper position to display the values stored for SEND 1 levels. The same applies for SEND 2, SEND 3, and SEND 4.

METERS

There is output metering in the form of a 12-segment LED just to the right of the LCD display. Input channel metering is displayed on the main LCD panel. Peak hold can be selected for the input channel metering. Clipping of the input signal is shown on this display. The input trim and input pad are used to set the input levels.

SCENE MEMORIES

Automation of the ProMix 01 comes in the form of scene snapshots. All of the

parameters, effects presets, EQ settings, dynamics, fader levels, aux sends, pans, returns — everything except the input trims and input pads — are stored as snapshots of the entire console. There are 50 memory locations for storing this snapshot information.

If you want to use scene memories to mix a song, you can set all the knobs and parameters for the first verse, store it in a memory location and name it "Verse 1." Do the same thing for the first chorus and name the memory location "Chorus 1." Continue with this method through the balance of the song. When you have stored all the snapshots, rewind the tape and play it from the beginning. When you get to the first verse, set the cursor on memory location "Verse 1," and press Recall. All the parameters jump to what they were for the verse. Do the same thing when you get to each part of the song — and bingo! You have automated your mixing process.

You can make moves that are recorded in real time by connecting the MIDI output of the ProMix 01 to a MIDI sequencer that is chasing SMPTE from your multitrack tape. Whenever you move a knob, the MIDI information pertaining to that move is sent out. If you then play back the MIDI sequence synced to tape, the faders will move exactly as they did during recording of the MIDI information. The MIDI information is output as controller data, so the recording of controller data must be enabled in the sequencer. Most of the computer-based sequencer manufacturers are supporting the ProMix 01 automation data.



EQUAL TIME: The ProMix 01 has 30 preset EQ programs and space for 20 user programs.

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94 DECEMBER EQ

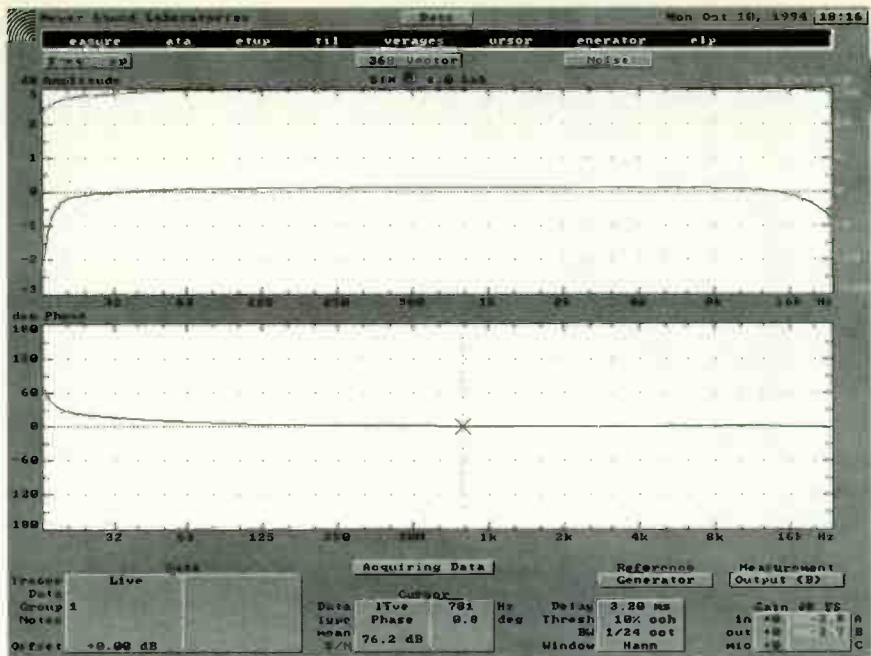


FIGURE 1: Sim-ply said, this is the SIM's view of the ProMix 01.

CONCLUSION

Conclusion? A conclusion signifies an ending. So far, everybody I have talked to who has purchased a ProMix 01 can't stop talking about how good it is and how inexpensive it was. I bought four of them to use on the Steely Dan tour, and I haven't shut up about the 01 yet. And as long as you keep cranking out good-sounding products, your clients won't be able to shut up about it either.

Donald Fagen is using one of them in his studio right alongside his Flying Faders automation to further automate effects returns. Walter Becker is using one to automate vocal rides in his Hawaii studio. (Walter's studio doesn't have any other automation yet. He says that just being able to ride a vocal or solo instrument may be all he needs.)

So check it out. It may be just the 16 x 2 console you've been looking for. **EQ**



ROGER AT THE RACK: Nichols backstage with four ProMix 01's at a Steely Dan concert.

Photo by Deborah Gray Mitchell

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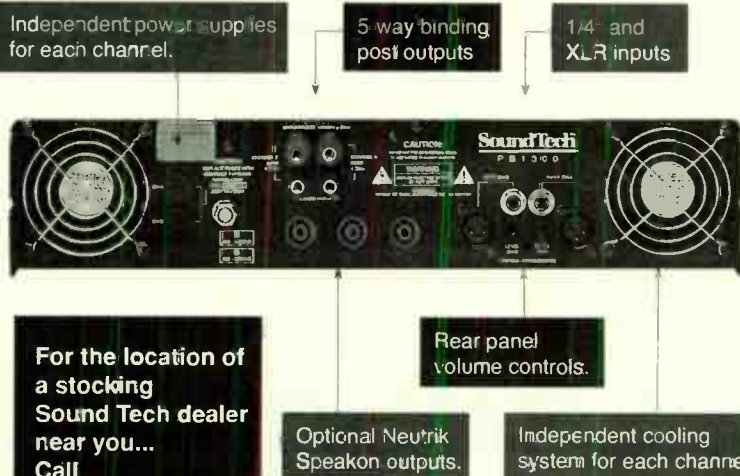
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Christopher Hoag—Composer

Personally, I believe the Fostex RD-8 is intelligently laid out, easy to use and, more importantly, it sounds good.



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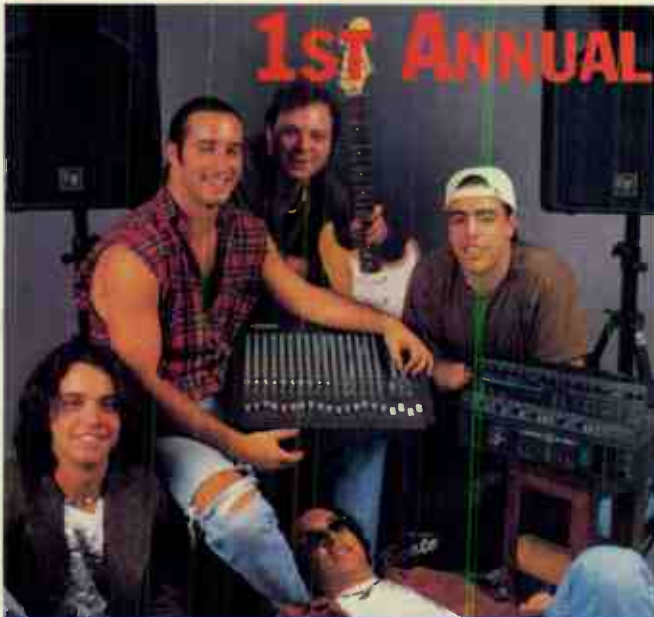


AES LIVE SOUND GEAR — PAGE 106

LIVE SOUND FOR THE GIGGING MUSICIAN

1ST ANNUAL

EQ BAND-IN-A-VAN



BEING IN A CLUB band these days is no easy job. To fully appreciate the trials and tribulations facing today's gigging musicians, *EQ* and several cooperating manufacturers sent a local band out on the road this summer. The manufacturers supplied the gear and *EQ*'s job was to put the system together. Here's how it went:

THE WHO'S...

The band chosen is named Tiajuana Caravan, and they consist of five members:

Josh Fagin (bass, guitar and vocals); Alex Klein (guitar and vocals); Craig Bruck (drums), Darren Bruck (guitar and vocals); and Matt Chervin (keyboards). While the instrumentation is traditional, Tiajuana Caravan's sound is complicated by the fact that lead vocal duties are shared by Josh, Alex, and Darren. As a result, having a high-quality front-of-house mix is crucial to the band's ability to effectively deliver a song — much more so than if there were a single lead singer. After carefully

EQ AND COOPERATING MANUFACTURERS SEND A TYPICAL BAND ON THE ROAD IN THE FIRST ANNUAL EQ BAND-IN-A-VAN SUMMER TOUR

BY STEVE LA CERRA

Photo by Peter Monroe

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World Radio History
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considering the options, the Caravan decided that if it meant being able to sound good from venue to venue, then they would bear the burden of carrying their own PA system.

WHAT THEY WANT, WHAT THEY GOT

The band wanted a system that was capable of easily filling 200- to 300-seat clubs with a healthy sound pressure level, but would not require a semi to move (sorry — no

Meyer MSL-3's). It had to be easy to set up and operate since there might be times when the band would be performing without the assistance of a soundman. Finally, band members wanted a modular system so that if they were playing a smaller venue, there would be no need for them to drag in huge speaker cabinets and racks of power amps.

The following gear was supplied to the band: Samson MPL 2242 mixing board; Crest CA-6 and CA-9 power amplifiers; Electro-Voice System 200, consisting of the Sx200 full-range loudspeaker, Sb120 bass module, and Xp200 controller; Alesis 3630 compressor/limiter; Alesis QuadraVerb effect processor; and Shure SM58, SM57, SM81, and Beta 58 microphones.

THE WHY'S...

The whole system would ultimately be contained in a road rack, so the mixing console had to be compact, but it also had to have enough mic inputs to handle extra microphones that might be placed on the drum kit and guitar amps



THE STRENGTH OF SAMSON: Samson's MPL 2242 mixer was the brain of the band's PA.

(for larger venues). The Samson MPL 2242 is a quiet, clean-sounding, cost-effective design offering 22 channels configured as 10 mono mic or line inputs and 6 stereo line inputs (having a stereo input channel would allow single-fader control of the left and right outputs of Matt's Roland D-70). The board has six sends: one prefader mono, one postfader mono, and two postfader stereo. One of the stereo postfader sends would be connected to the left and right stereo inputs of the QuadraVerb. The QuadraVerb output would be connected to one of the four stereo returns. One feature unique to the Samson unit is a volume knob for the main mix. This allows the gain structure of the console to remain set the same, even when the band needs to drive the output a little harder (in situations where a bit more volume is needed).

The MPL 2242 has other features that make it appropriate for this application, including quad discrete mic preamps, four-band equalization, and (quite importantly) sealed potentiometers. The sealed

pots are a necessity for a mixer that will often be used in a hostile environment; the tar and nicotine from cigarette smoke can adhere to the moving parts in a potentiometer, eventually causing the device to fail. Finally, the chassis of the MPL 2242 has a rotating jackfield that would facilitate its installation into a road rack.

Compression on the main system outputs was considered a necessity, both for keeping the sound level smooth and for protection of the power amps and speakers. Alesis supplied its 3630, which provides two channels of compressor/limiter/gate in a single rack space. Since the unit has controls for attack and release times, it could be adjusted to prevent the system from "pumping," while still maintaining safe and consistent levels to the power amps. The only drawback is that the unit has a wall wart power supply (ugh!), which we would deal with later.

For effects, we used the Alesis QuadraVerb, which requires little introduction. We wrote several new delay/reverb programs

that satisfied the band's needs, and in the event that the show was to be performed without a soundperson, the band could use one of these programs as a "set it and forget it" patch. This unit has a "line lump" outboard power supply, which we would also mount into the back of the rack.

The Crest power amps powered the full-range and subwoofer cabinets. The CA-6 drove the full-

range cabinets and delivered 350 watts into 8 ohms (with both channels driven). The CA-9 is rated at 550 watts per channel (again with both channels driven) and was chosen to power the subwoofers. Both amps are capable of delivering considerably more power into 4 or 2 ohms and can be bridged for even more output if necessary (CA-6: 1000 watts @ 8 ohms; CA-9: 1800 watts @ 8 ohms).

The front-of-house speaker system was the Electro-Voice System 200. This is a four-enclosure system consisting of two Sx200 full-range cabinets and two Sb120 subwoofers. Included with the system is the Xp200 processor that really does more than just route the high and low frequencies to their respective drivers. The unit also performs some time-domain processing to the audio signal, which ultimately time aligns the low frequencies with the high frequencies.

Since the full-range and subwoofer cabinets are identical in size, they can be stacked easily. The cabinets lock together when

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QUAD SQUAD: Alesis's QuadraVerb provided the effects for the band.

stacked, eliminating the possibility of the top cabinet's vibrating off the bottom cabinet. In rooms where space is really tight, the omnidirectional nature

of the subwoofers allows them to be placed far from the full range cabinets. (For more information on the Electro-Voice System 200, see *EQ* August 1994,

page 79.)

At most of the clubs, the PA system was used to reinforce only the vocals and Matt Chervin's Roland D-70. Shure Beta SM58's

were the choice for vocals. The D-70 fed a stereo input channel directly via two 1/4-inch cables. For some of the larger venues, an SM-58 was placed in the kick drum, an SM57 on the snare and an SM81 condenser mic overhead. SM57's were also used occasionally to mic the guitar amps, and at one particular club, the bass was run into the PA using a Countryman Type 85 FET direct box.

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RACK AND ROLL

To make the system easy to move and quick to set up, it was decided that all the electronics would be rack mounted into a single, heavy-duty road rack with wheels. The power amps were mounted in the bottom of the rack, with a one-space vent panel occupying the space directly above them. The Crest amps are fan-cooled, with the chassis vented in the front; this helped avoid any heat problems.

All the AC cables for the rack units were plugged into a Furman PB-8 power controller mounted in the top space of the rack. The AC cables from the various audio units were neatly dressed up the right side of the rack using wire ties and stick-on wire tie holders to hold them in place — away from any audio cables. While we were dealing with AC, we strapped the power supply for the QuadraVerb to the inside right panel of the rack, again using wire ties and wire tie holders. The wall wart for the Alesis 3630 was plugged into the PB-8 and then duct tape was used to strap the wall wart onto the back of the PB-8.

As previously mentioned, the MPL 2242 has a rotating jackfield. Normally, the connectors are located along the top edge of the mixer, but we rotated



the jackfields so that it would be visible when the back of the rack was opened. Having the jackfield facing the inside of the rack made for easy connection of the unit to (and from) the QuadraVerb and to the 3630 compressor. It also made for easy setup and breakdown of the mic cables and the cables from the D-70. The audio cables from the electronic components were neatly dressed along the *left* side of the rack, using still more wire ties and wire tie holders. Finally, a household night light was plugged into an open AC receptacle in the Furman unit so that the inside of the rack could be illuminated when necessary.

Once the band arrived at the gig, the only wires to connect were the speaker cables (usually four — two each for the subwoofers and full-range speakers) and the mic cables. If the room was large enough to warrant miking the instruments, the appropriate extra mics and cables were connected. Since the rack units were preconnected, setup took about 15 minutes. The night light in the rear of the rack was constantly in service, saving us from the darkness of the typical club. On the occasions where the club had their own PA system, a monitor send was ran from the house console into the MPL 2242 and the Electro-Voice speakers were turned toward the band for a great side fill monitor system.

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GET A GRIP WEED



BAND NAME: The Grip Weeds
MEMBERS: Rick Reil, guitars; Kristin Pinell, guitars; Mick Hargrave, bass guitar; Kurt Reil, drums; and, occasionally, Andy Burton, keyboards
LATEST RELEASE: *House of Vibes* 12-song CD/LP [Ground Up Records, New Brunswick, NJ and Twang! Records, Berlin, Germany]
WHERE THEY'VE BEEN: Court Tavern, New Brunswick, NJ;

Maxwell's, Hoboken, NJ; Continental, New York, NY; Khyber Pass, Philadelphia, PA; two week tour of Germany
WHERE THEY'RE GOING: More dates in the Northeast
HOW THEY GET AROUND: In America: red Chevy van (a.k.a. "The Can" or "The Red Roof Inn"); in Germany: supplied Ford Sierra diesel station wagon
MIXER: Mackie 1202
SYNTHESIZERS: Kurzweil K2000; Voce Micro B and Electric Piano; Wurlitzer Electric Piano; Dynacord CLS222 Leslie Simulator
EFFECTS: Real Tube distortion pedal; Marshall Guv'nor; Vox Wah; Boss EQ; Fox Rox Pro-Vibe

SPEAKERS: Trace Elliot 4 x 10; Fender 1 x 15; Electro-Voice 18 (in Traynor Cabinet) and EV100S
AMPLIFIERS: Fender Twin with Fender 2 x 12 speaker cabinet; Peavey Classic 50/12; Marshall amp head and 4x12 speaker cabinet; Ampeg SVT-II amp head (in rack with Korg tuner); Crest 4801 power amp
GUITARS: Fender Telecaster; Rickenbacker 12-string; Gibson Les Paul [2]; Fender P-Bass [2]
OTHER GEAR: Slingerland drumkit; Ludwig snare drums; Zildjian cymbals; D'Addario strings; Rotosound bass strings; Remo heads; Finger Ease; Boss Tuners
BEST LIVE EXPERIENCE: Mick

Hargrave states: Playing in front of huge German crowds full of incredibly friendly people who were musically hungry.
WORST LIVE EXPERIENCE: Hargrave continues: The entire tour entourage catching nasty colds all at once.
TOUR TECH TIPS: Hargrave comments: On our German tour, we only brought guitars, effects, cabling, power adapters, snare drums, bass pedals, and sticks over from the U.S. Amplifiers and drums were supplied according to our specifications by the promoter and the band we toured with, The Lemonbabies. We worked with house PAs for the most part.

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Sony PRMD-74

SONY IS MAD ABOUT MD

Sony is introducing the PRMD-74 professional quality MiniDisc media. The PRMD-74 has been engineered to ensure optimum reliability and consistent quality for professional applications, such as live sound and sound effects. The PRMD-74 offers up to 74 minutes of digital recording. The system employs state-of-the-art MiniDisc technology,

According to the manufacturer, the PRMD-74 has a dramatically reduced block-error rate over consumer versions of MD, and maintains a quality performance level of one million erase/read/write cycles. Another advantage of the medium is quick random access on rewritable media. Sound sources can be recorded on up to 255 tracks,

in both stereo and mono. The PRMD-74 comes in a CD-type jewel case, which includes an index sheet and APRS style label system. For further information, call 800-635-SONY. Circle EQ free lit. #139.

THE REAL THING

Sabine is premiering the REAL-Q, a real-time adaptive digital equalizer that monitors program material during a performance and maintains any specified equalization curve. Engineers can choose exactly what portion of the frequency spectrum is controlled by the REAL-Q and what portion is manually controlled. The unit offers a full-featured real-time analyzer; pink and white noise generators; memory; and a 31-band digital Master EQ and 31-band digital Correction EQ that can be superimposed on the ultra-bright LCD display. The REAL-Q offers digital audio interface for input and output of all digital formats, and the unit is capable of processing an analog and digital input

simultaneously. For more information, contact Sabine, 4637 N.W. 6th St., Gainesville, FL 32609. Tel: 904-371-3819. Circle EQ free lit. #140.

NEXO IN LINE

NEXO, a sound reinforcement speaker manufacturer located outside Paris, has enjoyed tremendous response to its line in Europe, and even more since it began offering its products to the U.S. and other markets this past year. This is its first showing at AES. On display will be both the PS10 and PS15 systems. Both systems are versatile and suitable for applications where space is at a premium. With their high-power handling and their sound clarity, coupled with their compact design,



NEXO PS15

THE 1995 SOUND-REINFORCEMENT EQUIPMENT PREVIEW

WARNING: these devices produce some very serious side effects.

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And for all those times you thought to yourself, "If only they'd make a 'rotary speaker cabinet' that could fit in my rack", say hello to

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ARS-10 24-bit signal

processing ensures perfect simulations with real room acoustics, in stereo. Every parameter is fully editable and programmable via MIDI. And like the DRP 10 and DRP 15, it's backed by a rock-solid, three-year warranty. What more could you ask for? How about a hands-on demonstration at your EV/Dynacord dealer! 📞 Call 800/234-6831 for detailed specs, a slick brochure and as much helpful information as you need.



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Allen & Heath's GL4 console

they are ideal for touring acts. The PS15, which features a 15-inch driver plus an asymmetrical dispersion horn, can be set in arrays or used as a stage monitor. For further information, contact QMI, 25 South St., Hopkinton, MA 01748. Tel: 508-435-3666. Circle EQ free lit. #141.

HOUSE SPECIAL

Allen & Heath's new GL4 is a front-of-house desk that also operates as a full-function monitor desk offering 10 mixes plus wedge/cue mix.

Available in 24-, 32-, and 40-channel standard models, the GL4 features eight sub-groups and eight programmable mute groups that also offer MIDI control. All inputs feature a tunable, continuously variable high-pass filter and four bands of full-sweep EQ, as well as 10 auxiliary sends per channel with 10 separate level controls. Each channel may also be assigned to a separate mono out bus. Expansion is possible via Sys-Link, and a meter bridge is available as an option. For complete details, contact Allen & Heath, 8760 S. Sandy Pkwy., Sandy, UT 84070. Tel: 801-268-8400. Circle EQ free lit. #142.



POWER TO THE MAX

ARX has released an updated version of its PowerMAX 2 full-range loudspeaker system. The PowerMAX 2 features a sculptured radial front mesh/baffle design and trapezoid angled sides for easy arraying and placement. Low frequencies are reproduced by an upgraded 15-inch bass driver with increased low-frequency output and power handling. High frequencies are reproduced via a 1-inch throat aluminum diaphragm compression driver loaded onto a new 90- by 40-degree constant directivity horn. This enclosure has been designed to be used as a system with ARX's Power-PRO Loudspeaker Processor, a dual-channel unit

that supplies EQ trim, crossover functions, phase correction, and I.S.C. speaker protection. For more details, contact ARX at 310-837-1380. Circle EQ free lit. #143.



The ARX PowerMAX 2



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Acoustic Performer Pro is more than just a guitar amp. It's the beginning of a new category in performance amplification.

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This concludes the written portion of the exam.



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World Radio History

LAISSEZ-FAIRE ROCK

PAVEMENT'S sound exhibits a few obvious antecedents — including The Fall, Sonic Youth, and Velvet Underground — yet remains somehow slippery to define. With their new record, *Crooked Rain*, Pavement reminds the MTV generation that the music they've been sold on is continually digesting itself — rock is rehash. The band's plaintive ballads and angry anthems poke fun at the rise of stadium-quality "alternative" music. While some indie rock bands wonder exactly what Pavement is so independent from and alternative to, Pavement doesn't bother. Instead they choose to wear

their influences with no apparent shame.

This "let it be" attitude appears in Pavement's live sound as well — sometimes to the band's detriment. During their Spring 1994 40-date U.S. tour in support of *Crooked Rain*, the band traveled in a '94 Chevy van filled with decaying (although functional) amps and essentially no sound reinforcement gear other than one Audix OM-7 vocal mic.

Bob Nastanovich, Pavement's percussionist, Moog Prodigy tweaker, and incidental screamer *does* take live shows seriously; he even documents each one in a journal. "For me, a live show is what you see

on stage and in the crowd, what you smell, what you drink, what happens when you go to the bathroom — every part of it." But regarding their equipment, Nastanovich admits that "there's nowhere to go other than up. Our stage-left guitarist, Scott Kannberg, has a completely trashed Fender Twin; our bass player, Mark Ibold, has a speaker cabinet that's just pathetic; and singer/guitarist Steve Malkmus has another Fender Twin that's just as bad. It's not as though the budget isn't there for buying new equipment; those guys just haven't settled on something they want."

Even with such forth-

right confessions about gear, Pavement managed to pull off two sonically accurate shows at the Great American Music Hall in San Francisco, where an excellent (although mono) house PA is installed. Besides, what the group might temporarily lack in hardware, they more than make up through their playing and their ability to engage a packed house. And, possibly most important, they commission Dutch freelance live-sound man Renko Schouten. "Renko's our best critic," says Nastanovich. "He's the one who's seen us about 150 times — he knows how we like to sound. On some nights the crowd is real passive, which makes us feel that we played badly, but he'll reassure us that we played fine. On other nights, he'll tell us, 'God, what a great crowd, but you guys were terrible.'"

Schouten, who's also toured with Cop Shoot Cop and The Palace Brothers, regrets the risks of touring without a dedicated PA — especially when Pavement goes through a small club's atrocious house PA. "The show in Tulsa was one of the worst," remembers Schouten. "They had these tiny little transistor-radio main speakers for about 500 people. Their disco setup was sounding better than the PA they had the band use!" If Pavement only played large concert halls, an unlikely event, then their dependency on a dedicated PA would be nil. "The Forum in London was great — they have a huge PA with



PAVEMENT HITS THE ROAD WITH NO SOUND REINFORCEMENT GEAR (AND NO, THEY'RE NOT MIMES)

BY CAMRAN AFSARI

Photo by Chris Toliver/Retna

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a lot of headroom," says Schouten. "I had no trouble distinguishing the sounds. It's the kind of place where you can really work with the sounds because when you turn a knob you can hear the difference."

One standard precaution Pavement takes is fronting the club with a contract that includes input and monitor needs, and also power requirements, which are based on crowd capacity. Outboard gear such as Drawmer noise gates and compressors also are requested. But sometimes, even after the contracts have been signed and returned, some smaller venues have a little difficulty in keeping their promises. "A couple of days before the gig I have to call the club people and make sure that everything is there," draws

Schouten in his Teutonic accent. "Most of the time they say: 'Well, we were not planning to supply all this, but if you *really* want it, we can do it.'" Nastanovich adds, "It's dishonest on their part, but we understand that renting additional gear is an expense that cuts into what they make."

Pavement complete their obligatory soundcheck at each venue, but Schouten also adjusts for acoustical differences between a reflective, empty space devoid of bodies, and an absorptive space full of them. "After the crowd comes in, they suck up a lot of the sound, they make it dryer," explains Schouten. "But sometimes that's good because some halls are so lively and reverby that you're happy a few people come to deaden it. I usually ask the promoter how many people

are expected, and then I can judge from experience how different the room will sound during the show." Although Nastanovich mentioned his band's indifference to their gear, he drew the line where an all-out smash-fest (along with crowd participation) might occur. "It's very advantageous for us to be close to our audience — we get a rise off that. We do like some interaction with the crowd, we don't really mind it too much if they get on stage — but they can't smash stuff up."

Rowdy audiences are less common on the continent of Europe. Most U.S. (and U.K.) bands are treated with greater awe abroad than back in their own relatively music-saturated countries. "From the standpoint of sound, we're usually in a much better position in

Europe," says Nastanovich. "We rent the entire back line (drums, amps) in Europe. It's all pretty new equipment that works better than what we have here." Lighter gear such as guitars and drummer Steve West's snare drum and cymbals are affordable enough to take on the plane.

Since their first LP, *Slanted and Enchanted*, Pavement has motivated (or tricked) scores of reviewers into psychoanalyzing their songs. Just how much of this is conscious or random on Pavement's part, we may never know. "I've never really wanted to pin down a definition for what we are," claims Nastanovich. "We've always wanted to be creepy, not in a sleazy way, but in a way that makes your skin crawl, or gives you goose bumps."



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Claus Wiedemann
Chief Engineer

1995 VANS FOR YOUR BAND

WHETHER you're hauling across the country or across town, you need to be sure you're going to get to the gig safely and on time. You need good reliable wheels, and once again, as a special service to our road-warring readers, *EQ* has done some research into a few of the latest van models from the Big Three and here shares some of what's new for 1995:

DODGE

For 1995, Dodge has extended its full-size Ram line of vans and pick-ups by adding more functionality and power. Engine sizes range from a 3.0-liter V6, through two V8's, up to the massive 300-hp, 8.0 liter Magnum V10 (that's right), which generates 450 foot-pounds of torque. You could carry the Philharmon-

ic with that much power. The Ram one-ton 3500 series equipped with the Magnum V10 can carry a gross combined vehicle weight of 19,000 pounds. Six transmissions are available — three manual and three automatic units.

Dodge Ram vans can be had with or without windows and rear side doors. A host of interior touches make life on the road easier. The center of the front seat in the Club Cab models folds down to double as an arm rest and console. The console contains compartments that can hold a laptop computer, CDs, cassettes, or a cellular phone. And you can keep a few extra pairs of drumsticks in there for you-know-who.

The midsize Dakota range of vans provides ade-

quate power and space for most bands and their gear. The smaller front-wheel-drive Caravans will generally accommodate the medium-size act comfortably and safely in the most economical way.

All Dodge trucks and vans have a driver's-side air bag as standard. Antilock brakes are standard on many models. And be sure to check out the six-speaker AM/FM stereo cassette audio system that's available from Dodge.

CHEVROLET

Chevy's line of heavy-duty vehicles also comes in various sizes. The full-size Chevy Van offers cargo space of up to 306 cubic feet and towing capacity of up to 10,000 pounds — enough to handle those arrays, racks, and stacks.

The Sportvan version of the model has all the credentials of a serious work truck, but is outfitted with up-level Beauville trim.

The Sportvan is a spacious, comfortable touring car, as well as a workhorse. New features included with the Beauville package include power door locks, power windows, a tilt wheel adjustable steering column, electronic speed control, and electric below-eyeline-type outside electric mirrors.

A wide variety of power plants are available, including an economical V6, three V8's and two diesels. The standard V6 has been improved for '95 to make it quieter, as has the 230-hp, 385-foot-pound, 7.4-liter V8. New Dextron III automatic transmission fluid that never needs replacement under normal operating conditions (I guess that rules most of us out) is part of the standard 4-speed

electronically controlled transmission.

Safety is a concern to Chevrolet, as evidenced by its provision of a standard driver-side air bag and four-wheel antilock brakes. Conveniences such as Scotch fabric protector and AM/FM stereo add to the enjoyment. Three models are available: the G20 (5-8 passengers, 125-inch wheelbase), G30 (8-12 passengers, 125-inch wheelbase), and G30 Extended (12-15 passengers, 146-inch wheelbase).

The economical Astro is a midsize people-mover and cargo-holder that has been completely restyled for '95. All Astro models have an extended-body design with 10 inches of extra interior room behind the rear wheels and nearly 19 cubic feet of additional cargo carrying capacity.



**A LOOK AT WHAT THE TRAVELING BAND
USES TO GET TO WHERE THEY'RE GOING**

By DAVID JACOBS





VAN GO: Ford's Aerostar (above) and Club Wagon (left, top) and Chevrolet's Astro (left, bottom) can get you where you're going in style.

Astro is available with rear-wheel drive or all-wheel-drive. It also offers an innovative rear Dutch door option for 1995, which provides the versatility of a double door with the visibility advantage of a full rear window.

Standard equipment includes Solar-Ray glass, Scotchgard, and air conditioning with CFC-free refrigerant. A 4.3 liter, 190-hp CPI V6 engine is standard.

The ever-popular Suburban "Superwagon" can play many roles: full-size people mover, rugged cargo hauler, or cross-country grand touring machine. It will hold up to 49.5 cubic feet of cargo.

New standard features include a driver-side airbag and a brake/transmission shift interlock. A four-wheel

antilock brake system is also standard and is controlled by a dual master cylinder. An all-new instrument panel, attractive new door trim panels and new contoured seats make the spacious interior a comfortable, as well as safe, environment.

And, just as important, a whole new family of entertainment systems is being offered, from a standard AM/FM stereo radio on up to a multispeaker, fully automated system with CD and tape capabilities.

FORD

For 1995, Ford is continuing to build on its strength as a sales and quality leader in full-size vans. On the Econoline Super Van, a sliding side cargo door is available as a no-charge option. Five new clearcoat metallic


paints are available on the full range of Econolines: Champagne, Dark Red Berry, Medium Willow Green, Eclipse Blue, and Portofino Blue.

A 7.3-liter direct injection "Power Stroke" turbodiesel replaces the 7.3-liter naturally aspirated version. The new power plant is available with an electronically controlled four-speed automatic transmission. Other engines include a 4.9-liter V6; a 5.0-liter V8; a 5.8-liter V8, and a 7.5-liter V8. Horsepower ranges from 150 to 245 hp and payload ratings from 1370 pounds to 4185 pounds. There are 8-passenger, 12-passenger, and 15-passenger versions.

For the act that prefers a sportier, more carlike mode of transport, Ford offers its popular Aerostar

line. There are two versions: a 7-passenger wagon and a cargo van. Side-door beams join the driver-side airbag, brake/shift interlock, and rear antilock brakes as standard equipment, so you travel with that more secure feeling. A 3.0-liter V6 is standard and 4.0-liter V6 is available as an option.

The wagons are available in extended lengths; the cargo vans, however, are not. Standard payload capacity is 1860 pounds. And for your comfort, a new comfort option is available for '95: captain's chairs.

So, if you and your bandmates are in the market for a new mode of transportation, see a dealer soon, take one of these vehicles out for a test drive, and see how much better life on the road can be. 

SABINE FEEDBACK ELIMINATOR



FEEDBACK is so loathed by audiences and system operators alike that a company, Sabine, actually named its feedback-fighting device "exterminator" — a word usually reserved for combating disease, vermin, and insects. This comes as no surprise to anyone who has experienced a powerful sound system run into clipping by a microphone feeding back. The result can be harmful to hearing and to sound system components.

In spite of amazing advances in the technology, feedback is often the limiting factor in the vol-

ume capability of a sound reinforcement system. Feedback is best overcome through good system design and realistic performance expectations. However, a filter that can significantly increase gain-before-feedback may sometimes be needed in order to provide the user with the full potential of the system. Typically, achieving this requires an experienced sound system operator well-versed in the specialized skill of "ringing out" the system.

Sabine offers its patented Feedback Exterminators to those who lack

the time, hands, personnel, or experience to manually adjust a filter for this purpose. With this handy tool a band can have louder and perhaps better sounding onstage monitors; a pastor can finally be heard in the back row of the church; and a rental company can send out a system that is more likely to work — even if the users are not experienced with sound reinforcement. From the rodeo in the local arena to the Gritting Teeth world tour, a tool to automatically filter out feedback can be very useful.

HOW SABINE DOES IT

Sabine began years ago as a manufacturer of flutes, eventually expanding into electronic instrument tuners and then their line of automatic feedback filters. The FBX-1802 builds on Sabine's long experience in electronic tuners to determine the pitch (frequency) of the feedback. In a feedback exterminator, that information is then applied to the tuning of a notch filter. DSP techniques allow the FBX-1802 to more closely determine what sounds actually are feedback (and not just sustained notes) while also increasing the flexibility of filter design parameters.

The Sabine FBX-1802 uses the same DSP technol-

ogy as the company's high-end ADF 2400 Workstation, minus the user-definable parametric filters. The two-channel FBX-1802 automatically sets up to nine filters per channel into a feedback prone system. The DSP technology borrowed from the ADF Workstations includes improved feedback determination and bandwidth-selectable filters.

Basic operation of the FBX-1802 is kept very simple. Plug the unit in line with the system and turn up the microphone gain until feedback starts. The FBX-1802 then senses the pitch of the feedback and inserts a notch filter tuned to that frequency. By turning up the system and waiting for the FBX-1802 to notch out each ring, up to nine filters can be tuned.

The user can select the number of filters that remain static after the initial feedback tuning session is complete, leaving the remaining filters to chase after the unexpected feedback ringing that can occur while the sound system is in use. It is also possible to lock the depth of the static filters even if the system rings at that frequency again. The final option is that of bandwidth: 1/10 octave for music or other critical listening situations and 1/5 octave for more

ROAD TEST

MANUFACTURER: Sabine, Inc. 4637 N.W. 6th Street, Gainesville, FL 32609. Tel: 904-371-3829.

APPLICATIONS: Automatic reduction of feedback frequencies in sound reinforcement systems.

SUMMARY: A DSP-based filter bank for improving gain-before-feedback that is especially useful in unattended sound reinforcement systems.

STRENGTHS: Extremely easy to install and use; selectable bandwidth of notches; user-defined maximum number of filters for automatic feedback extermination both in system setup (static) and during system operation (dynamic).

WEAKNESSES: Unit may be fooled by some musical instruments; feedback will always be plainly audible before the FBX begins to look for it; may sound overly filtered when used to automatically fix really problematic systems.

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▶ Channel Features Include:

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- Each channel provides 2 equalised inputs



▶ Sub-group and MIDI command center includes the solo in place/solo safe switching controls along with the 4 mute buss assignments and security system.

▶ Each of the P7's 8-sub-groups are normalised to the direct tape outputs allowing for the permanent connection of tape lines. Changing the direct tape out status to a group out is as simple as flipping a switch. 4 fully assignable stereo aux returns with high and low equalisation provide for effects returns and/or additional instrument inputs. Group inserts allow for the connection of additional effects processors.

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- Dual 2 track returns to the console
- Main and near-field switching at the console

The P7's operating levels are switchable from -10dBV to +4dBm

▶ Is it any wonder that STUDIOMASTER mixing consoles have been the choice of major artists such as Phil Collins, Mike Rutherford, Chick Corea and many others... as the centerpiece of their home studios for years?



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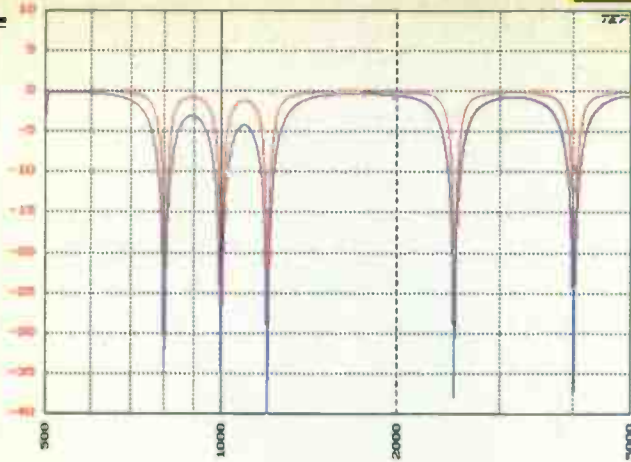


Figure 1: Comparison of 1/10-octave (red) and 1/5-octave (blue) filter bandwidths.

radical feedback elimination in speech applications (see fig. 1).

The FBX-1802 user interface is very basic. There are two rows of pushbuttons for reset and for setting filter bandwidth (1/5 or 1/10 octave); controls are included for the total number of filters, the number of fixed filters, and the locking of fixed fil-

ters. Programming the unit is a simple matter of holding the appropriate button and waiting for all the LEDs on that channel to flash four times. This enters the FBX-1802 into programming mode. During operation the Filter LEDs light up to display the number of filters in use. The last filter automatically set or reset will remain flashing.

The FBX-1802 does not limit the feedback levels, so if a squeal takes right off, system clipping and pained listeners can result. Even if the squeal only lasts half a second, at high volume even that short duration can seem like a very long time. I always recommend that when "ringing out" a sound system, a limiter be inline to prevent the feedback from taking off into the danger zone — and this is also a good idea when using the FBX-1802.

FEEDBACK TIME

The specified time for feedback elimination is 400 ms for mid band (1 kHz) frequencies; as the frequency range of feedback gets lower, the FBX-1802 takes progressively longer to eliminate it. The FBX-1802 is usually very quick in eliminating a feedback ring, but I found I could fool it into trying to eliminate notes played on a flute, synth, etc., that were sustained for a second or more. The unit is capable of ignoring notes from instruments that produce significant harmonics. [Even experienced sound techs have been fooled by instruments that momentarily sound like feedback.]

The automatic operation of the FBX-1802 may also be its major flaw. If, after "ringing out" the

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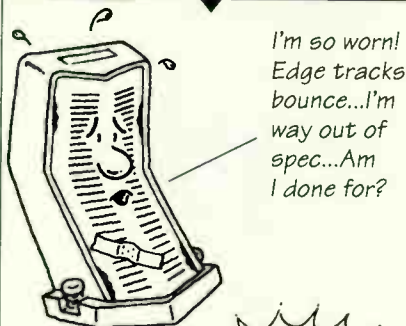
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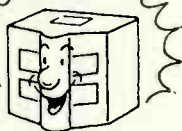
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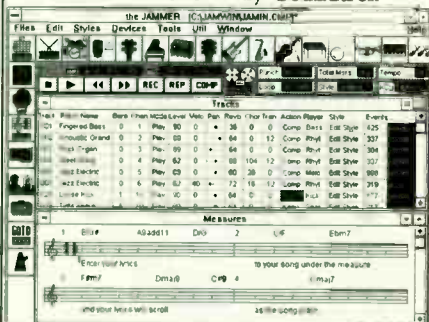
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sound system using the FBX-1802, the system seems too heavily filtered (i.e., the filters are detracting from the sound quality), then the only option is to reset the filters and go through the whole operation again. An experienced sound tech, on the other hand, can quickly reset or just reduce the amount of (graphic) EQ, if the system sounds too EQed.

There is a point where a specific frequency will just begin to "ring" after it is excited by a sound, taking slightly longer to decay and adding a hollow quality to the sound. An astute mixer will be able to notch the offending frequency out before anyone on stage or in the audience even realizes it was going to feedback. The FBX-1802 cannot work with such subtle cues, the feedback must be fully developed into a howl before it starts to look for it. However, the FBX-1802 does have the advantage of being able to quickly tune very tight notch filters faster than most monitor engineers I know, and could be a very useful addition to a monitor system where the tech is too busy or has performers who often make unexpected moves that cause instantaneous feedback.

If you are providing sound reinforcement for a band in which only certain microphones may be prone to feedback, it would be an improvement in the overall sound (and the accuracy of the FBX-1802's feedback determination) if the unit were patched into a channel (if there is only one such source) or group (if there are a number of sources, e.g., lead and backup vocals). This way the FBX-1802 can operate on just the sources of feedback and not on synths, guitars, or drums that do

not have any potential for making the sound reinforcement system feed back. This is the same approach as intelligent system voicing: you don't apply the tone shaping required for the lead singer's Shure SM58 to the whole band sound because then you would just have to undo that tonal shaping on each instrument's input strip EQ!

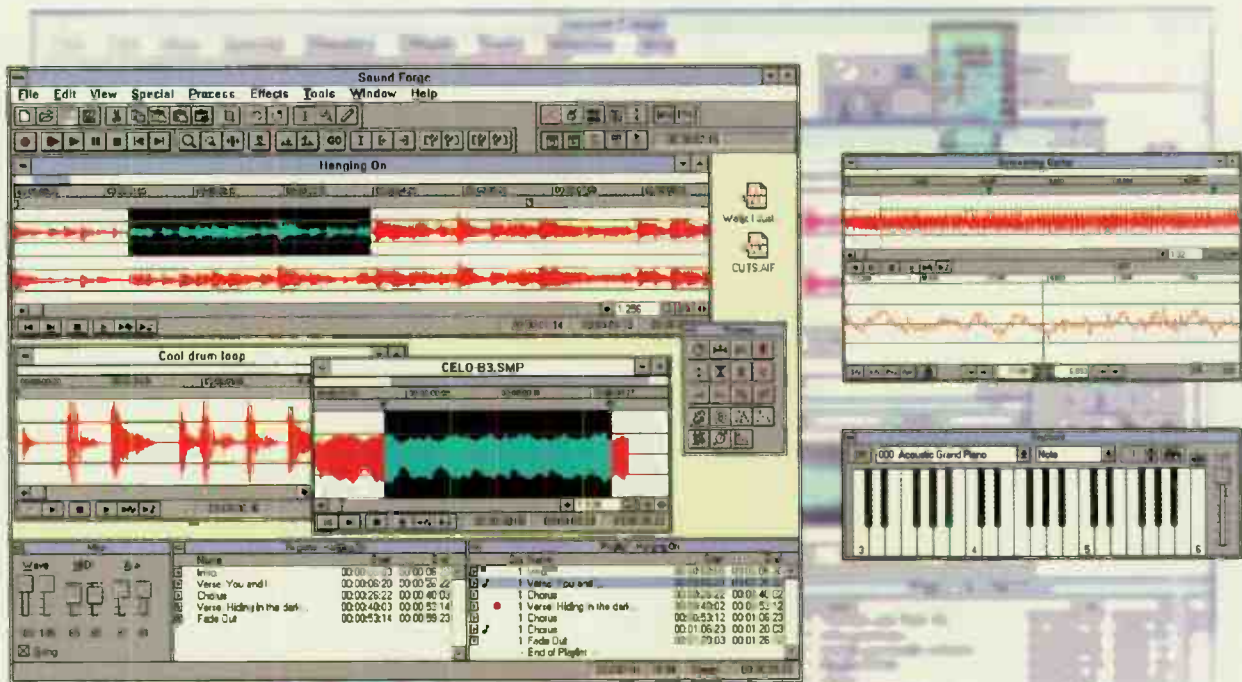
SOMETHING TO GAIN

Sabine has developed a very smart approach to setting the gain structure of the FBX-1802. Two rotary controls (channel A and B) adjust the level of internal clipping relative to the input signal. Two 5-segment LED meters display dB below clipping for each channel. Adjusting the clip level maintains unity gain through the unit while optimizing the dynamic range of the unit within the sound system (i.e., compensating for -10 dBV or +4 dBm nominal levels). The clipping level of the unit can be adjusted during use without causing any audible changes in the sound from the system.

The FBX-1802 is compact (1U), well constructed, and clearly labeled (with the exception of the power on/off rocker switch which lacks any indication of the on position). The manufacturer is planning to add a bicolor LED to future units to indicate when power is ON. An external power supply with latching DIN plug connector also features the "lump-in-the-line" format of transformer that includes screw-mounting tabs. A choice of audio connectors (XLR or 1/4-inch phone) with ground-lift switches and balanced or unbalanced operation is offered. The bypass switches for each channel provide hardwire connection of

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input to output and include power-off bypass for fail-safe operation.

The unit's audio performance features a dynamic range of over 100 dB (18-bit D/A and A/D conversion) and peak headroom of +25 dBV. The FBX-1802 also includes a noise gate on the output of the unit, with a threshold of -60 dB below the clip level. This is a use-

ful feature in some situations where the system includes a noisy mixer or signal delay, although I would prefer that a defeat switch (even if internal) were offered. No provision is made for linking the filters between channels for true stereo operation, because the unit is intended to work as two very compact but independent filter sets.

Installed sound systems are one of the most obvious applications for the FBX-1802. In locations ranging from hotel conference rooms to bingo halls, there are many sound reinforcement systems that are run without an operator. An FBX-1802 hidden in the equipment rack would ensure that these systems remain stable while increas-

ing the gain-before-feedback.

In more complex systems that have experienced operators, the FBX-1802 can be applied in conjunction with the traditional 1/3-octave graphic EQ. The graphic is used to voice the system (and provide access to filters during the show) and the FBX-1802 is used to filter out the worst of the feedback frequencies during sound check. The units would operate during the show with only one filter in dynamic mode while the other bands are set to fixed/locked. This prevents the problem of feedback occurring in the vocal monitor and filters being automatically assigned in every mix (drum monitor, guitar monitor, etc.) of the system that includes that vocal mic. This could also be the case in situations where the FBX-1802 is used in both the FOH and monitor systems.

If you or your clients have been unable to control feedback, then the FBX-1802 will be a welcome addition. The SR system will still feed back, but only briefly at any one frequency, and the gain-before-feedback should definitely be improved over having no feedback filtering. If you find your graphic EQ has 12 or 15 dB cuts selected to reduce feedback, then it is very likely the FBX-1802 will be able to improve your gain-before-feedback and the quality of sound from the system. In systems that must be run very near the threshold of feedback, this unit may be able to limit the duration of feedback and salvage an otherwise unacceptable situation. For those that require control over the filter settings and have a larger budget, the more expensive Sabine devices are also worth investigating.



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Audio-Technica AT4050/CM5

A completely subjective look at the new microphone from Audio-Technica that has everybody talking

BY STEVE LA CERRA



Audio-Technica introduced the AT4033 cardioid condenser studio microphone to fill a need within the audio community. The need was for a large-diaphragm microphone that was capable of high-quality studio recordings of vocals and instruments, and sold at a price that would leave money left over to pay the rent. Response to the AT4033 was so enthusiastic that Audio-Technica set out to design another large-diaphragm studio condenser mic, this time with variable pickup patterns. The result is the AT4050/CM5 multi-pattern capacitor microphone (\$995, including shock mount). The AT4050/CM5 contains two identical hand-built capsules with diaphragms that are about a third larger than that in the AT4033, allowing for increased low-frequency response and SPL handling capability. The mic is finished in a handsome matte black and is intended for use with the AT8441 shock mount. It is 7.40 inches long, has a maximum diameter of 2.10 inches, and weighs 16.9 ounces.

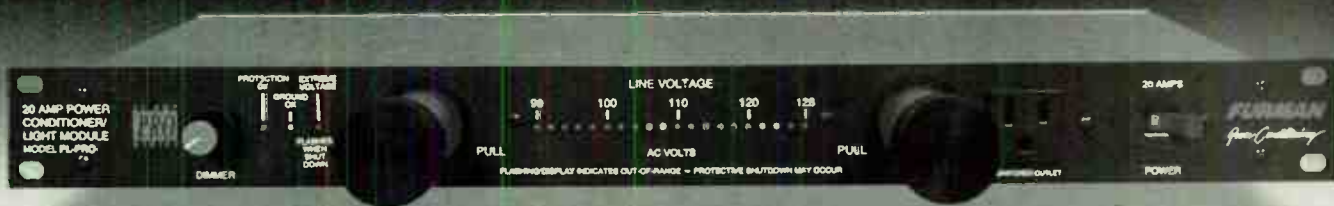
The AT4050/CM5 is a side address, transformerless capacitor microphone with three switchable pickup patterns: cardioid, bidirectional (or "figure eight"), and omnidirectional. The A-weighted noise level, according to Audio-Technica, is 17 dB, and the unit can accept a sound pressure level of up to 149 dB *without* the pad. Switching the pad in circuit will allow the microphone to accept sound pressure levels of up to 159 dB(!). If you have plans to record sounds with a higher SPL than that, you might want to be more concerned with the hazard to your hearing than with which mic you are using.

A low-frequency roll-off switch kicks in at 80 Hz with a rate of 12 dB per octave and can be used to reduce the microphone's sensitivity to low-frequency rumbling and vocal "popping." An open-cell windshield is permanently attached to the inside of the grill to further reduce the chances of popping.

The AT4050/CM5 actually uses two separate microphone elements, each with a 2-micron-thick vapor-deposited

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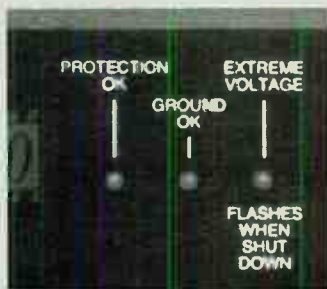


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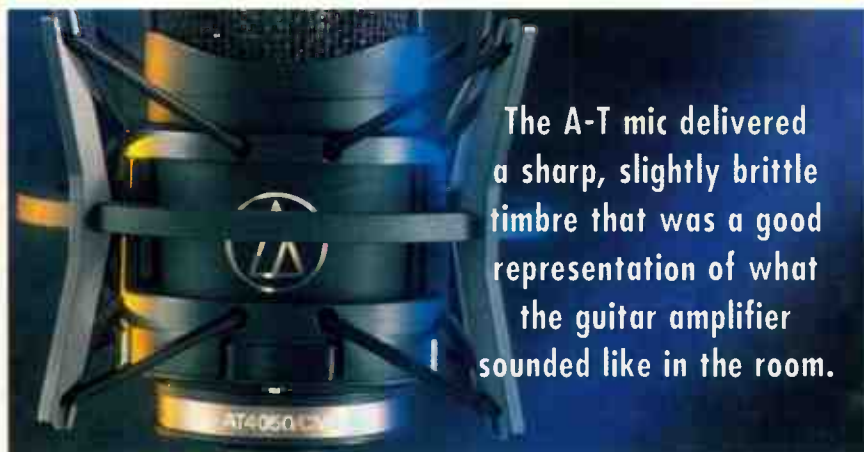
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gold diaphragm. Audio-Technica maintains that the design of these diaphragms allows the mic to reproduce subtle high-frequency sounds that a typical large diaphragm mic might not be able to capture (our in-studio tests verified this claim). The electronics within the body of the mic combine the two elements to produce the three different polar pattern responses. As with most capacitor or condenser microphones, the AT4050/CM5 requires phantom power (+48 VDC, ±4 volts) for operation.

I used the AT4050 with the AT8441 shock mount over a period of several weeks, starting with a session where I recorded a Martin steel string acoustic guitar. The mic was connected to a Demeter VTMP-2 mic preamp and then to a Valley Commander (for a touch of compression), and the output of the compressor was connected straight into an Otari MTR-90II tape machine. The mic was used with the pickup pattern set to cardioid and both the pad and the roll-off switches set to "off." The capsule of the mic was placed roughly 40 inches in front of the guitar, with the diaphragm pointing directly at the area where the neck and body meet. It was this placement that seemed to be the "sweet spot" for this mic/instrument combination. I needed a transparent, percussive timbre that would not be "lost in the sauce" with the other instruments. The AT4050 delivered this with a bright, slightly "jangly" tone that needed no equalization to stand up in the mix. There was enough presence to distinguish the acoustic guitar, but it was not *so* bright that the tone was harsh (this presence peak is confirmed by the AT4050's frequency response chart). The mic's cardioid pattern was

tight enough to yield a focused image, yet wide enough to include some of the room reflections without sounding blurred. Moving it toward the sound hole area resulted in a boomy timbre that overemphasized the low-frequency overtones — a typical result for this type of placement.

Next I miked an electric guitar through a stereo Marshall 4-12 cabinet driven by a Mesa/Boogie power amp. Though many people use dynamic microphones on guitar amps, I have found that sometimes the transient response of a condenser mic can supply a more interesting tone. The mic was run straight to tape (again through the Demeter mic pre), and the pad and low-frequency roll-off were switched off. The first thing I noticed in this application was that the output of the AT4050 is indeed *hot*. When miking the same amplifier with an AKG C414, the Demeter VTMP-2 would typically be set to the "40 dB" gain setting. The AT4050 overloaded the input stage of the Demeter unit at this setting, so the "30 dB" setting was used. The mic was placed about 12 inches in front of one of the speaker cones and pointed about 30 degrees off axis and slightly downward. At the same time another of the 12-inch speakers was miked with a Shure SM57 dynamic mic at about the same distance, pointing almost straight down the throat of the speaker. A baffle was placed between the two mics to maintain separation. In this context, the A-T mic delivered a sharp, slightly brittle timbre that was a good representation of what the guitar amplifier sounded like in the room. There was a bit of harshness to the tone, which was appropriate to the rude vibe of the song being recorded. While the SM57 pro-



The A-T mic delivered a sharp, slightly brittle timbre that was a good representation of what the guitar amplifier sounded like in the room.

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vided the lower midrange "thunk," the A-T provided the "air" and articulation of the guitarist's picking technique.

The AT4050 was also used on vocals, first in a session where two background vocalists were recorded in a control room that also contained a (rather noisy) 2-inch 24-track machine. The mic was set to the bidirectional pattern with one vocalist at 0 degrees and the other at 180 degrees (thus both on axis). The mic was placed in the room so that the tape machine was at 90 degrees (directly off axis). The bottom line here was that the off-axis rejection of the mic was good, with minimum leakage of mechanical noise from the tape deck, yet there was consistent tone from the vocalists in front and back of the mic. There was a very slight presence-peak in the sound, and the low-frequency roll-off switch did a good job of keeping "p's" from popping. Very little rumble was transmitted via the mic stand during this recording.

When used in the cardioid pattern on a male lead vocal, the AT4050/CM5 exhibited a definite proximity effect at

distances within roughly 10 inches (whether this is desirable or not is a production decision). The A-T's wide dynamic range and high SPL capability became quite apparent during this application — the vocalist sang loudly and close to the mic, but never overloaded it (even without use of the pad). When the vocalist brought his voice to a whisper, the mic tracked his dynamics, capturing the warm and breathy quality he projected. An external pop screen was necessary to filter out popping "p's" and "b's," but the LF roll-off combined with the shock mount kept foot noise transmission via the mic stand to a minimum.

The AT4050's switches were easy to reach and use (no tools required) and never accidentally switched to a different position when the mic was placed into or removed from the shock mount. I wish that the shock mount had a more secure means of holding the mic in position: the mic simply slips into the elastic suspension bands and although the mic never came loose, it was difficult to tell whether or not it had been fully inserted into the mount.

The Audio-Technica AT4050/CM5's clarity and transparency make it a valuable tool for studio recording, and its high SPL capability make it useful in a variety of situations. The switchable pickup patterns will be welcomed by engineers who like to experiment with mic placement techniques. One thing that was *not* noticeable when using the AT4050 was the microphone's self-noise — it simply never became an issue. Good studio microphones never come cheap, but the AT4050 is realistically priced within the reach of the project studio owner and would make a welcome addition to any studio's mic locker.

Audio-Technica U.S. Inc., 1221 Commerce Drive, Stow, OH 44224. Tel: 216-686-2600. Circle EQ free lit. #145.

Steve La Cerra is a senior editor at EQ and an independent recording engineer/producer who has just finished work on Dagger's upcoming release Fate Of A Violent World for North America Music.

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IN REVIEW

BSS DPR901 Equalizer



MANUFACTURER: BSS, 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-909-4500.

APPLICATION: Top-end single-channel dynamic equalizer for project studios, commercial studios, post sweetening, mastering, and live sound.

SUMMARY: Four bands of sophisticated frequency-selective and threshold-dependant compression and expansion.

STRENGTHS: Superb degree of dynamic control; very flexible; easy to operate; informative metering; very unobtrusive and transparent; a 1U solution to vocal and other exacting source processing.

WEAKNESSES: Effect might be too subtle for some; concept of dynamic equalization mind-warping at first.

PRICE: \$1599

EQ FREE LIT. #: 146

THE DPR901 dynamic equalizer is yet another fresh approach to a topic from an innovative British company. It has presented frequency-selective dynamics in a fashion that will be familiar to anyone who has ever used a parametric equalizer.

Rather than operate as a normal parametric EQ that can boost or cut a band of a predetermined width by a selectable amount, the DPR901 still deals with frequencies and bandwidths, but instead compresses or expands them. The "dynamic" aspect of the unit is dictated by a threshold control that sets the point above which the selected amount of compression or expansion at a given frequency and bandwidth, or Q, kicks in. The ballistics of the compressor/

expander are soft-knee to begin with graduating to near-limiting.

A word of warning: don't think that you'll be able to use the DPR901 like an ordinary EQ. Although it may look a bit like one, it doesn't behave like one even though it can create near-EQ-type effects. The fact that the device is dynamic means that unlike a standard EQ, it doesn't work on the signal all the time. It only works on the parts of the signal that exceed threshold settings.

So why should you want one? Look at what it's got — four sections (which can be regarded for operational ease as EQ bands) and each of the unit's single channels can be bypassed so you only have to use what you want. These sections equate to

overlapping LF, Low Mid, High Mid, and HF, and the signal chain is cumulative just like an ordinary equalizer.

Now take a bass guitar track that booms on the low F# and think how you'd fix it now that the bass player has gone back to his mother's. You could drive the whole lot hard through a compressor to flatten it off and EQ the offending frequencies out. Both methods, however, alter the nature of the remaining sound substantially unless you're prepared to poke the processing in on the fly. You could have plugged the DPR901 in on the insert, tuned one band in to the F#, tightened up the Q, applied a wallop of compression and adjusted the threshold so that only the offending note pokes through. Problem solved.

And it's not just corrective processing that is available; you can use the DPR901 creatively. Say the female singer has a wonderful wispey quality to her voice, but it's not cutting through the mix; so add a little broadband expansion in the upper midrange to accentuate it. Rather than alter the spectral content of a signal wholesale like an EQ does, the DPR901 adjusts the dynamics of what is already there. Consequently, the effect is generally not nearly as dramatic as an EQ can be, but it is certainly dramatically different to what you could achieve with EQ alone.

Presentation is straightforward once you get your head around what it



is that this unit does. Each of the four bands has a bandwidth pot variable from 0.5 to 3, an expansion/compression pot where an EQ's boost/cut pot would be, and a sweepable frequency control. The bands cover 40–320 Hz, 150–1600 Hz, 800 Hz–9 kHz, and 1.6–18 kHz, and are individually selectable on an illuminated In switch and overridden by a master In button.

Each section also has the all-important Threshold pot that sets the level above which processing will occur. (This is helped by the inclusion of typically excellent BSS-style metering.) A vertical bar displays the incoming signal in relation to the selected threshold level and glows green below, orange at the point, and red above. Two-part horizontal meters to either side of the threshold meter glow green and to the left when compression is occurring and red and to the right when expansion is happening. Not only do these meters make the device truly psychedelic when in full flight, but they also make it easy to use as you get clear indication about the nature of the incoming signal in each band and what you are doing to it no matter how subtly. Each section also has a Fast Release button that is quicker than the default automatic program-dependent setting. However, the auto release ballistics are so good that this button is almost superfluous.

Continuing with the EQ analogies, the LF and HF sections have shelving buttons that bypass the bandwidth bell pots and yield shelving compression or expansion sliding

on the frequency pots at either end of the signal chain. Thus, it is as easy to compress a notch in the bottom end as it is to expand the lot. Identically positioned buttons in the two mid bands disable their filter circuitry and they become frequency-independent compressor/expanders, so you can mix traditional dynamics with more elaborate frequency-sensitive processing in the one unit.

Sounds can be tightened up or changed dramatically by adjusting the perceived ratio of frequencies and the results are quite unlike anything else.

There is a further twist. Each section has a switch marked Below that effectively flips the selected processing to apply only to signals below the threshold. Thus, expansion or compression of frequencies can be applied to the quiet bits as well as the loud bits.

The potential of combining the different processing of sections should not be overlooked — the

DPR901 can easily supply a touch of de-essing, some plain compression, some bottom-end expansion, and a notch-like lift simultaneously, for example. It is not for nothing that the unit has already gained a reputation as an exemplary vocal processor.

The threshold meters can show what the frequency constituents of a signal are in a given band by putting the threshold at its most sensitive and twiddling the frequency around. You might think that you'd like to do something creative at 10 kHz, but the threshold meter might barely light, indicating that very little is happening up there in the program. If you're stubborn, you could turn the equation on its head by going to below-threshold processing and expanding, but the result would be comparable to a gas leak from the speakers. As with any device that fiddles with dynamic range, you have to respect program noise because this can be expanded and compressed with equal ease.

Generally speaking, the better the signal, the better the results, and the DR901 is at its finest when dedicated to a single high-quality source. Stereo mixes can be processed by locking two units together via 5-pin DIN sockets on the back panel with front-panel settings being averaged so imaging does not shift.

Corrective surgery to dodgy programming is best started with frequency-selective compression, which has a profound effect on improving clarity. A bit of expansion in the voice band increases intelligibility beautifully.



Corrective surgery to dodgy programming is best started with frequency-selective compression, which has a profound effect on improving clarity.



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The unit's performance on isolated bass, guitar and keyboards is best described as exemplary. If you want to go ultra-deep or ultra-skinny or make a pad sound more efficient by restraining some of the more overpowering notes so the track has more air in it, then the bottom two bands on this unit will help you do it. Sounds can be tightened up or changed dramatically by adjusting the perceived ratio of frequencies and the results are quite unlike anything else. It can give a sound a character that others will ask about and because you're only processing part of the signal more of the liveness is retained. Things don't actually sound processed like they do with blanket EQ or compression, they just sound well-recorded and in your face.

The subtlety of the DPR901 is unlikely to cause many impulse sales because you have to live with it for a while and really understand what it's doing before you get hooked. But the sweetness of this realization is satisfying and highly addictive. In fact, it changes the way you listen, and you'll find yourself thinking in terms of the device's four bands as a starting point for a sound that is close but still needs a little something extra. Reaching for this unit first in such circumstances is a safer bet than using EQ simply because it's more transparent.

Many top sound engineers in studios and on the road have quietly been getting in to the DPR901. If you are looking for something a little different or for a more sophisticated means of dynamic control, then you owe it to yourself to hear it. Now here's something that really is new.

—Zenon Schoepe

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IN REVIEW

OSC Deck II Version 2.1



MANUFACTURER: OSC, 480 Potrero, San Francisco, CA 94110. Tel: 415-252-0460.

APPLICATIONS: Hard-disk recording, whether for recording, broadcasting, postproduction, composition, and so on.

SUMMARY: Turns a compatible Mac system into a 4-track digital multi-track recorder; the companion Metro sequencer adds full-blown MIDI sequencing options.

STRENGTHS: Cost-effective and easy to use; pro-level functionality; didn't crash once during the review; integrates superbly with Metro and OMS (Open MIDI System).

WEAKNESSES: Limited DSP functions; no master volume fader; pitch shift doesn't shift up, only down.

PRICE: \$399

EQ FREE LIT. #: 147

THE ORIGINAL DECK software was the harbinger of hard-disk recording for the masses. After loading the program into a

NuBus-equipped Mac with an Audio-Media card, you had a 4-track, computer-based "Portastudio" for digital audio.

A lot has happened since then, and Deck II has evolved into a far more sophisticated program. Improvements over the original include nondestructive editing, QuickTime movie display and synchronization, snapshot and on-screen moving fader automation (with optional data thinning), unlimited virtual tracks, standard MIDI file importing, and transparent "hooks" for the companion Metro sequencer (see sidebar) so you can simultaneously run MIDI sequencing and digital audio.

Although Deck II is light-years beyond Deck, it fortunately hasn't forgotten its roots of being easy to use or cost-effective. Deck II's motto could easily be "Performance Without Pain."

Deck II runs on the Mac 840AV and 660AV, providing 8 and 6 tracks, respectively, with no external hardware. Other eligible Mac systems (IIX, cx, ci, fx, vx, LCII, LCIII, Quadra, Performa 400/600, and Centris 650) require a digital audio card (Digidesign AudioMedia I or II, Sound Tools II, Pro Tools, RasterOps Media-Time, or Spectral Innovations' NuMedia card). The program also wants at least 4 MB of RAM, a fast hard drive (27 ms or better access time) suitable for digital audio, System 7.1, and QuickTime (included).

Installing the software simply means dragging a few files to the right folders. Copy protection involves "authorizing" your hard disk from the master copy; you can optimize hard-drive data without deinstalling the program.

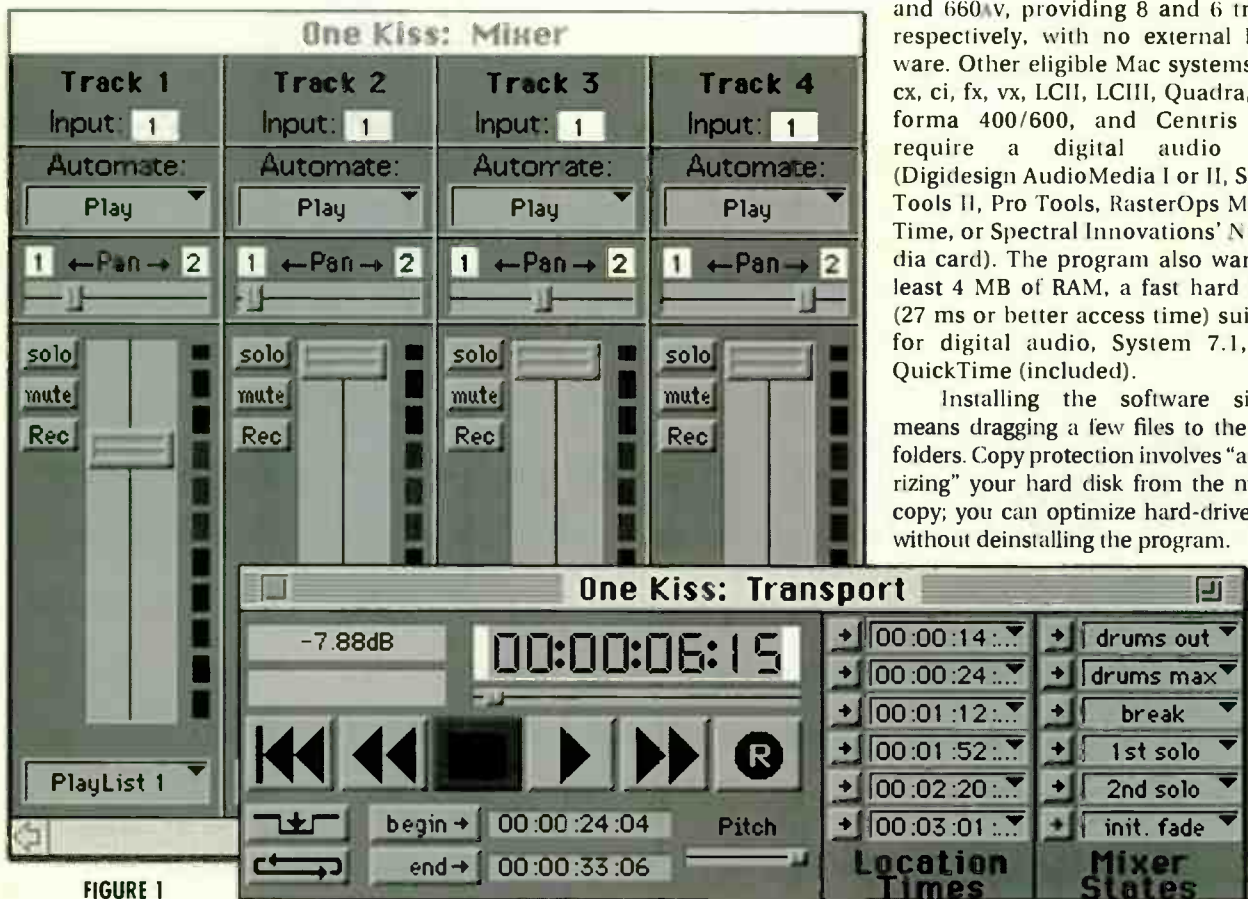


FIGURE 1

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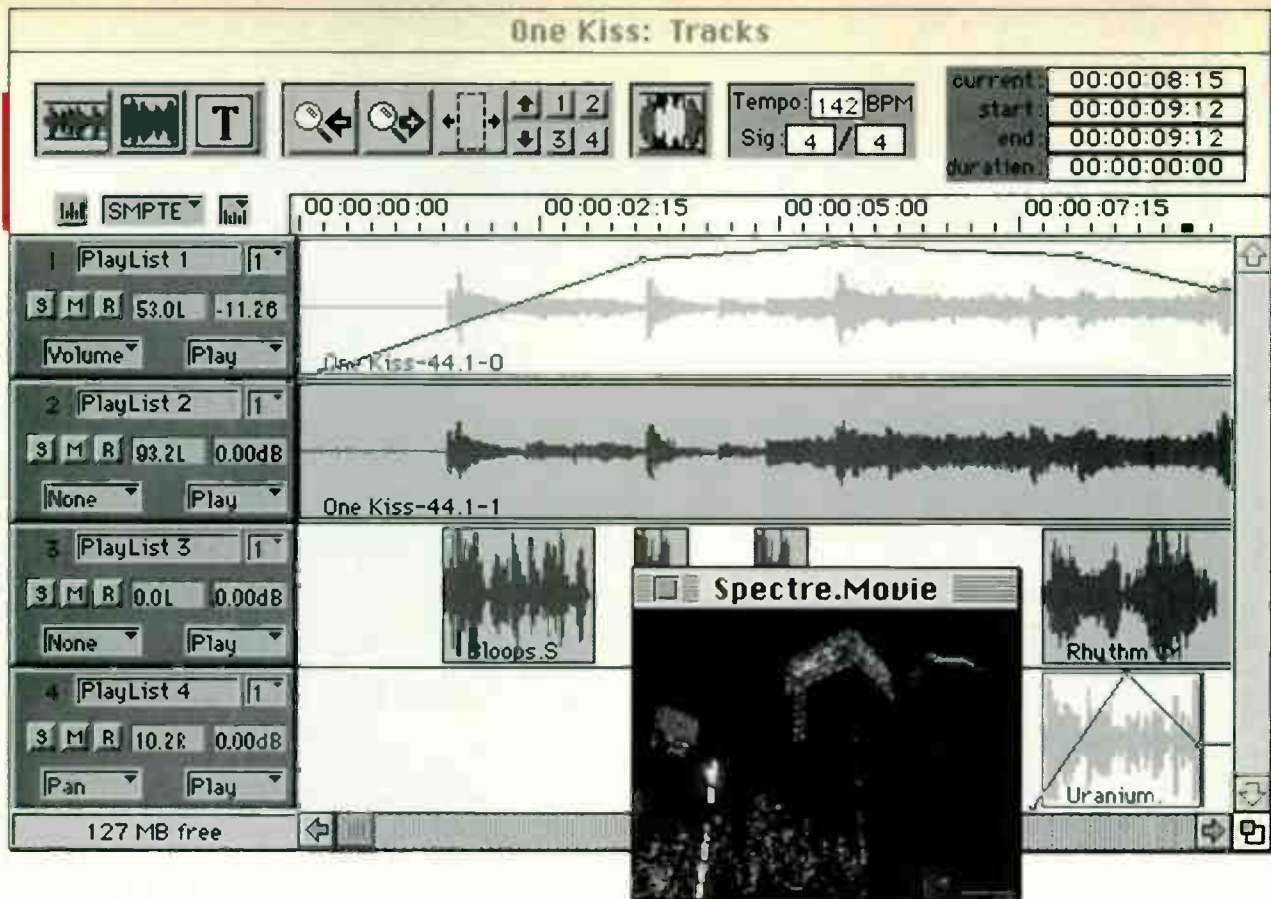


FIGURE 2

DIGITAL ARCHITECTURE

As in other hard-disk recording systems, audio is treated as a collection of *regions* recorded on hard disk. A region can be an entire track or a single note. A *playlist* describes which regions of audio to play at what time. This makes it easy to shuffle different song elements around, and is great for remix applications. A library window shows all available regions.

Deck II can record as many tracks as you want, but can only play back 4, 6, or 8 tracks simultaneously, depending on the hardware. These can be any of the recorded tracks. For example, you

could record 12 tracks of guitar solos and use pieces from each track to create a single composite track. This would use up only one of Deck's available tracks.

The audio files and playlists are stored in a Session folder that holds all the elements needed for a specific recording project, including Metro files if applicable.

WINDOWS ON YOUR MUSIC

Deck II has three main windows. Figure 1 shows the four-channel mixer (basically the signal routing module) and transport. Each mixer input strip has selectable input, level fader,

automation control (playback, record volume and pan, erase volume and pan), and three buttons — solo, mute, and record. There's also a 10-step LED meters with peak hold.

Level and panning are quantized to 1024 steps, but these are interpolated in DSP for greater resolution. As a result, changes are very smooth.

The transport window is straightforward: time counter, stop/play/fast-forward/rewind/return-to-start/record buttons, six autolocation points, six mixer snapshots, punch enable, looping with easily set loop points, and pitch control (downward transposition only). Clicking on a button takes effect even if the transport window is not the top window, which definitely speeds up operation. Deck II allows for a type of scrubbing, and, while rewinding, plays back small sections of audio so you know where you are in the piece.

Setting an autolocation, loop begin, loop end, or punch point takes no more than two mouse clicks and a mouse drag or keypress. Or you can just hit the Enter key to register an autolocation point on the fly. Each point normally shows a time, but can also be named. Although only six autolocation points are simultaneously visible, these are chosen from a pop-up menu of up to 200 nameable points.

TAKING THE METRO

OSC's Metro sequencer (\$225) is a rewrite of Dr. T's Beyond. When run simultaneously with Deck II, Metro adds synchronized MIDI sequencing. Getting this to happen is a real no-brainer, since the two work together smoothly and simply. Although any OMS-compatible sequencer will work with Deck II, Metro offers more options due to its close integration with Deck II.

Metro has a simple, obvious "feel." However, like Deck II, there are a lot of goodies that you appreciate only after using the program a while. For example, the cycle record mode is excellent, most editing operations are real time, and the programmable faders are easy to set up.

Nesting "subsequences" within sequences is not new, but Metro simplifies the process. Graphic controller editing is very good, and the program is fast. All in all, Metro is an excellent adjunct to Deck II, but it's a respectable OMS-compatible sequencer program in its own right that provides the bonus of both Galaxy and Unisyn support.

The six mixer snapshots work similarly to autolocation points. In fig. 1, they all have new names. You can also set a global transition time between snapshots, and record snapshots into the mix automation data. (By the way, the "-7.88 dB" to the left of the counter reflects fader 1's attenuated setting.)

The tracks window (fig. 2) shows the digital audio in all its wavy glory, along with a QuickTime movie imported from Spectre VR (a great game, by the way). This window is where you get out the virtual razor blade and do the cut-and-paste boogie. There are three main view-options (one track, 2-4 tracks, or 8-track overview), with zoom-in all the way to the sample level. Each track can also record and show pan and volume information — just click to create a volume breakpoint, then drag it around as desired (note the volume curve on track 1). Track 4 shows panning information; the track pans across the stereo field, then hits center.

This window has all the expected features: zoom in and out, marquee a selected piece of audio, option-click and drag to create duplicate regions, change start and end points, and the like. When you have the track view set up just the way you like, you can save it and up to three or more as a "view memory." Whenever you want to return to a view, select the button.

GETTING AROUND

Within five minutes of installing the software, I was importing audio files, recording, processing, and editing. I didn't run into any real head scratchers except that of figuring out how to enable the mic input on the AudioMedia board, and even that only took a couple of minutes. This is a program that makes life easy for you.

Furthermore, Deck II has a rich set of keyboard equivalents so that once you learn your way around the program, you can really fly. One tip: Make sure you re-read the manual periodically to pick up on all the zillions of nonobvious shortcuts built into the program. Because Deck II is so easy to use, it's tempting to think that you know the program after working with it for a while; but really, there's a lot

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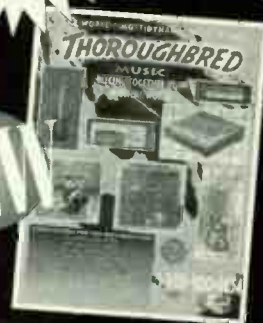
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beneath the surface, such as extensive synchronization options that make Deck II suited to video and postpro applications as well as to music.

Deck II is also big on calibration, which really helps. You can see waveforms in seconds, samples, SMPTE times, or bars and beats. This last is handy when you want to "snap" audio regions to a grid (bar, half note, eighth note, etc., down to 1 tick). This is like quantization on a sequencer.

MIDI AND SYNC TOOLS

The track volume and pan faders can be controlled with MIDI continuous controllers, such as those generated by the JLCooper FaderMaster or Peavey PC1600, and record this data as part of the session. On the transmit end, Deck II generates MIDI timecode.

For simple MIDI applications, Deck II can import standard MIDI files, split each channel off onto its own track, and set that to an interface port and channel. With OMS (Open MIDI System), the program can address MOTU's MIDI Time Piece and Opcode's Studio 5. Tempo maps are retained, and Deck will change its calibrations to reflect the tempo.

To do simultaneous MIDI/audio recording or editing, or drive a MIDI Time Piece or Studio 5, the Deck II/Metro combination is the ticket. Switching between programs is seamless. Deck II and Metro are also well integrated with OMS. This means that synth names can show up in the MIDI port window, as well as all the other linkage and sync benefits that OMS offers.

Regarding SMPTE sync, Deck II can do "trigger sync" on record or playback (you tell it when to start, then it freewheels), but continuous resynchronization can occur only during playback. The implication is simple: sync Deck II to digital stuff while recording and you'll be okay. Striping an analog tape with SMPTE

and driving Deck II gives variable results, depending on speed variations within the analog deck.

DSP

The digital signal processing (DSP) capabilities are minimal: normalization, group normalization, inverse, reverse, and duplicate — no compression, limiting, or EQ. Then again, you can always skip over to Sound Designer, do bunches of editing, then send the modified files back to Deck II. Deck II makes this easy.

Space doesn't allow covering all the features, such as the extensive library of crossfade curves for creating nondestructive crossfades (that only takes up one of the four channels), ease of bouncing and how you can bounce to a destination track without erasing it, spotting regions to timecode, the mix-to-disk option that takes your session down to two tracks (zap it to DAT directly though AES/EBU, if your card supports this)...you get the idea. There's a whole lot going on here for the price.

One of Deck II's most interesting attributes is that whether you're just getting started in hard-disk recording or doing big-bucks postproduction editing, Deck II is the right fit. It's not intimidating, yet the more you get into the program, the more you realize just how much it can do. The software is stable, comparatively fast, and a breeze to learn and use.

Although the Deck II/Metro combination has competition from products such as Opcode's StudioVision AV, Deck II holds its own; as usual, your specific requirements will dictate the best option. But if you want to get into high-level hard-disk recording and MIDI without breaking the bank or compromising your sound, the Deck II/Metro combination is ideal — and has enough horsepower to grow with you. This is a clever, cost-effective piece of software. —Craig Anderton

ADD EIGHT

OSC recently introduced the 8-Track Tool (\$129), which provides 8 tracks of digital audio when running Deck II on a single Pro Tools system and adds four faders to the mixer window. You need a Quadra family computer and hard disk with maximum 15 ms access time and minimum 1 MB/second throughput.

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.

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!

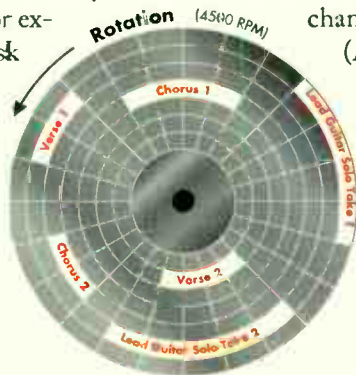
Of course, how the DR4d sounds is as important as how it works. Advanced 18-bit oversampling A/D and D/A converters insure crystal clear sound, and with a full 96dB dynamic range, the DR4d offers no-compromise specs. The four balanced 1/4" input and output jacks are switchable between -10 and +4 operation, 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

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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.

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!

DR4d

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Lead Solo
Verse 2
Chorus 1
Verse 1
Chorus 2
Lead/Solo/Talk 2

Penny & Giles MIDI Management



MANUFACTURER: Penny & Giles Inc., 2716 Ocean Park Blvd., Suite 1005, Santa Monica, CA 90405. Tel: 310-452-4995.

APPLICATIONS: MIDI control signal generator (continuous controllers, program change, pitch bend, etc.) for studio or stage.

SUMMARY: Clearly geared toward high-end studios, the MM16 is a sturdy useful box that is the most advanced MIDI control generator available — but you pay for the privilege.

STRENGTHS: Solves the usual fader box update problem; well-built with high-quality components; extensive feature set, including MMC and sequencer control capabilities; dual MIDI Ins and Outs.

WEAKNESSES: Expensive; no sys ex dump or template presets available in the unit under review; sending a snapshot doesn't change LED meters, so you can't get a sense of the snapshot values.

PRICE: \$2500

EQ FREE LIT. #: 148

has a sloping front panel but can be rack mounted. There are 16 controller "belts" (more on this later) that serve as faders; 16 general-purpose switches (for triggering notes, program changes, etc.); sequencer-oriented Start/Stop/Continue buttons and a tempo control for when the MM16 serves as a master clock; a five-button "transport" that generates MMC commands for FF, rew, play, stop, and record; eight bank/program select switches that select one of 64 programs, eight function switches; and a data wheel and four buttons (inc/dec, cursor left/cursor right) for parameter editing. A backlit LCD provides your window to the MM16's world.

GETTING HOOKED

Two independent MIDI outputs (main and aux, each with six paralleled thru jacks) provide a total of 32 channels. There are two MIDI inputs, each with an associated thru jack. One input merges incoming data with data pro-

MORE AND MORE engineers use MIDI for real-time signal processor and sequencer control, yet few hardware devices are optimized for this application. P&G's MM16 is the high end of MIDI control generators, but do the benefits outweigh the price —

especially given the competition from devices such as the JI.Cooper FaderMaster and Peavey PC1600?

FIRST TAKE

The MM16 is a quality piece of gear. It



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A totally new, radically faster editing paradigm, with:

- Track Layering—Each track is four layers deep. You just visually “peel back” the layers to reveal the sections you want from each one.
- Object Oriented Editing—gives audio “objects” (say, a guitar solo) handles you can grab to slip, position, nudge, stretch, or trim the objects on-screen.
- Free Form Editing—works in regions of time, with edit operations applying to the marked segment only.
—Each track can be viewed and edited in either OOE or FFE mode at any time, regardless of the edit mode of the other tracks around it.
- Spline-fit algorithms—automatically fit amplitude edits to Bezier curves, eliminating impossible dynamic shifts between samples.

- Literally hundreds of other interface and feature optimizations to let you do more work and do it faster.

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World Radio History

duced by the MM16 (the merged data appears at the Main out), while the nonmerged "control" input can vary MM16 settings and call up programs from an external source.

Power comes via a locking connector from a wall-wart transformer. There is no power switch. A slot accommo-

dates PCMCIA 2.0 RAM cards; one can store up to an extra 128 snapshots and 64 programs. This can either add to the internal programs or back them up. (The review unit could back up only to cards; however, Penny & Giles claims sys ex backup will be available in a software revision due out this fall.)

ON THE BELTWAY

Most automation systems need to deal with updates. For example, if an automation system changes levels, the faders aren't going to change (except for moving fader systems). This is a problem if (for example) a physical fader is up all the way, and the system then changes that fader value to the minimum value. You can't increase the value manually because the fader physically can't move any further. A typical solution is "nulling" LEDs, which indicate when the fader position matches that of the current value. You can then "punch in" fader changes.

The MM16 takes an entirely different approach by using a continuous belt to vary the "fader" value. Manipulating the belt is very much like using a track ball that goes forward and backward, but not sideways. The belts are made out of translucent plastic, and the top part moves over a 20-step LED meter. Thus, as you move the belt away from you, the output data value increments and the LED meter underneath your finger lights up more segments. Pull the belt toward you, and the reverse happens. If you move the belt slowly, it can pass through every controller value, but when you slam it down, the belt responds fast. (I was able to go from 0 to 127 in four steps.)

The LED meters can respond to external MIDI control messages entering the MM16. Making changes is very easy: simply pushing the belt away from you increments the existing value, so you don't have to worry about matching levels.

Each belt can be assigned its own function, MIDI channel, range of values covered, and MIDI output (main or aux). Belts can also be master controls for groups of belts and "link" to other programs.

OTHER CONTROLS

The 16 switches (which can respond in a momentary or toggle manner) located above each belt can transmit note, program change, and controller messages (push for a value of 127, release for a value of 0), as well as turn the belt off. Note velocity can be set to a single value or varied with the associated

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An open letter from Morris Ballen, Disc Makers Chairman

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Morris Ballen, Chairman

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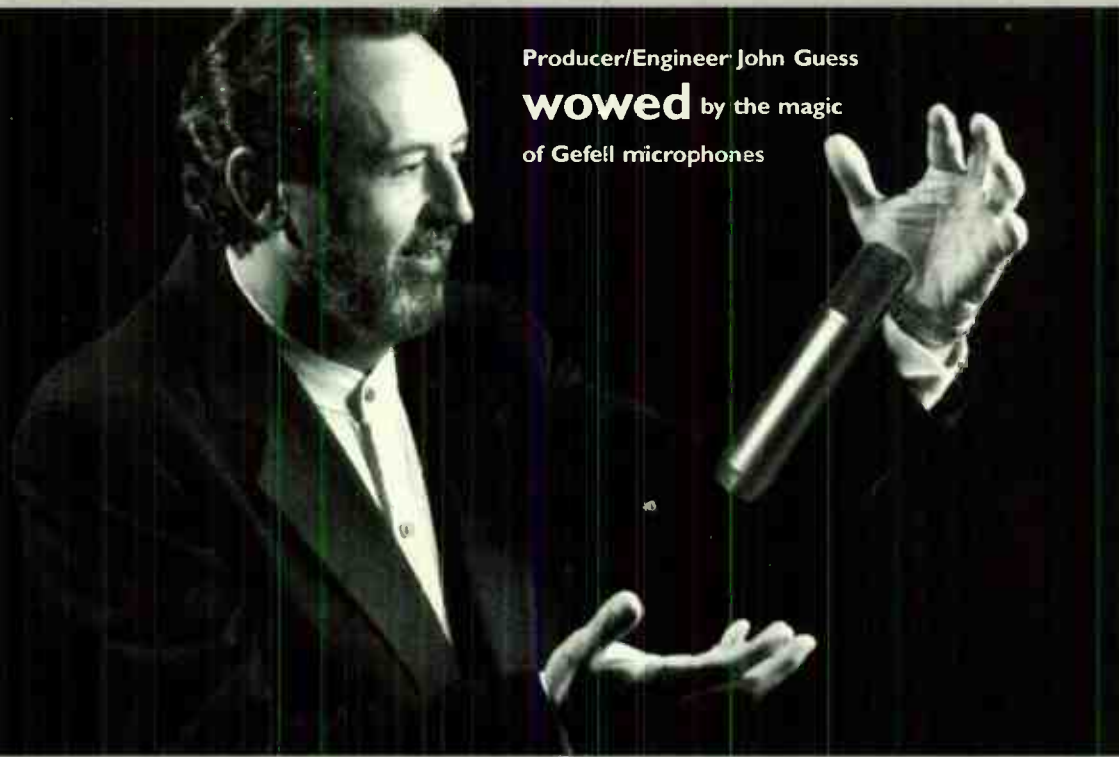


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belt; moving this cancels the belt's previous function. The switches can also send a 64-byte string when pressed and a second string when released (or when pressed a second time in toggle mode).

The footswitches can step up and down through programs and snapshots, duplicate some of the sequencer and tape transport controls, provide a "tap tempo" function, and perform MMC punch in/out. Finally, the MM16 can transmit a setup string of MIDI data.

There are plenty of other functions, such as the ability to choose which belts and buttons respond to update messages; memory protect; internal to card copy; and more than we have space to get into here. Oddly enough, though, there are no "template" presets to show all this off (not even Controller 7 on each of the 16 MIDI channels). Penny & Giles is considering including libraries of templates on floppy disk (for Mac or PC) with a sys ex loader program.

The MM16 can also store 128 snapshots of the belt and switch positions. Sending or storing automatically increments to the next snapshot. This makes it easy to set up a variety of mixes as you run a tape (or sequencer) over various sections, then spit out the snapshots as the tune plays continuously in real time. However, when you send a snapshot, the LED meters don't reflect the change.

IS IT WORTH IT?

The MM16 is a no-holds-barred, high-quality MIDI control generator that fits right in with high-end studio environments. If it cost \$1000 it would probably be a runaway success; the \$2500 price tag will make many people balk. Whether it is worth the extra money is something that will be dictated mostly by your working style, clientele, and use of MIDI.

If you use a control generator mostly for sending data, then less expensive models will probably do the job. But if you do a lot of MIDI mixing to a sequencer that is constantly updating values, or simply need an "industrial strength" controller, the MM16 is the one to beat.

—Craig Anderton

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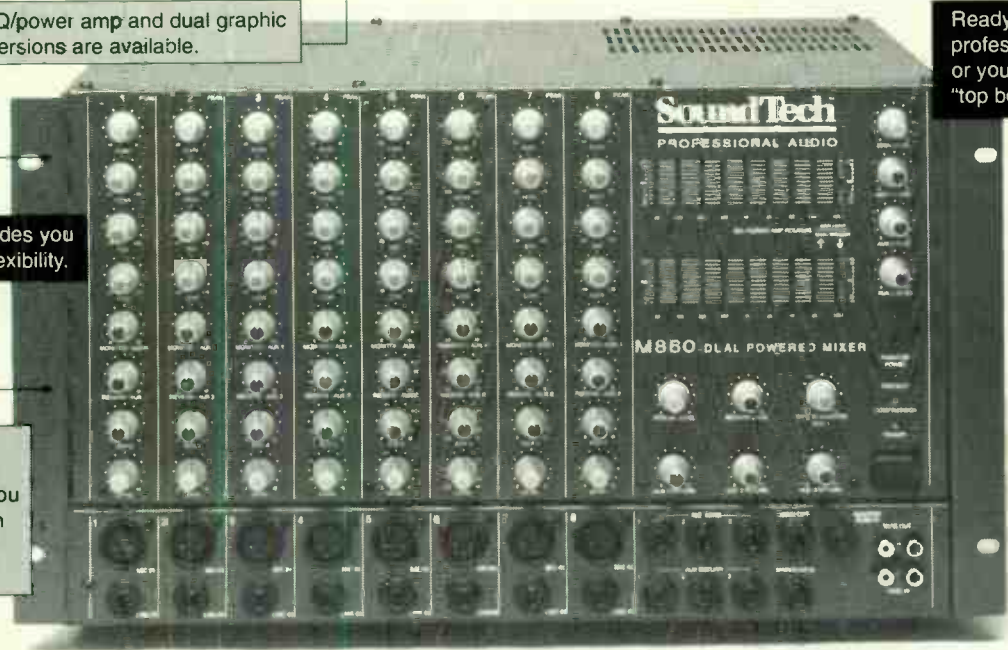
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REVIEW SHORT

The Windows Configuration Handbook

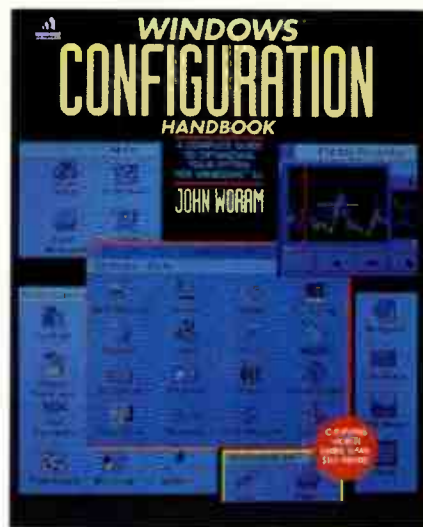
John Woram, the author of the *Sound Recording Handbook*, is back with a tome for PC users

As most computer owners know, there's nothing quite as complex as software that claims to make things simpler, and Microsoft's Windows undoubtedly takes some kind of prize for head-scratchers, mind-bogglers, cryptic files, "do it my way or else" syntax, and other ticking time bombs in the name of "user friendliness."

Since the newest versions of Windows come with instruction manuals not much bigger than the average garage-sale flyer, it falls to the writers self-help books to explain to the befuddled or bewildered consumer what's really going on.

John Woram's *Windows Configuration Handbook* (Random House Electronic Publishing, 1993 ISBN 0-679-79113-2, \$34) is a standout on the shelf. As anyone who has read his *Sound Recording Handbook* or his best-selling *PC Configuration Handbook* knows, Woram has a well-deserved reputation for clear, concise writing and for his ability to make even the most complex subjects easily understandable. And in a time when computer books are increasingly being written either for self-proclaimed idiots (and thus long on forced humor and short on useful information) or for techno-freaks (densely packed with obscure technical detail so as to obscure the fact that the authors don't have a clue), Woram provides a rare blend of perfect clarity and subtle wit.

Beginning with Chapter Zero (he explains this) and ending with a wonderful final section that details some of the "Easter Eggs" hidden in popular programs, Woram takes the reader on a grand tour of Windows by way of some of the most comprehensive "Here's how you do this, and here's



what you do if it doesn't" chapters around, which, as any Windows user knows, is the most important part. If something goes blooie at midnight, a book like this can be worth its weight in gold.

There are two detailed chapters on Control Panel, the second of which deals with drivers, audio, and MIDI and includes its own troubleshooting section. *EQ* readers will find much of this material familiar after reading Woram's articles in the March and April issues. The "Control Panel: Part II" chapter also deals specifically with some of the more popular multimedia and CD-ROM systems and what the user might encounter in setting those systems up, plus instructions on what to do if things don't go quite as smoothly as the equipment manufacturers always cheerfully assure one they will.

Windows Configuration Handbook is an essential reference for anyone who uses Windows. How can one go wrong with a book that not only explains everything, but comes with comprehensive instructions for its use:

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3. Open it.
4. Read.
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That says it all. —Marte Brengle

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Behringer Combinator MDX 8000



MANUFACTURER: Behringer, distributed in the U.S. by Samson Technologies, PO Box 9068, Hicksville, NY 11802-9068. Tel: 516-932-3810.

APPLICATIONS: Stereo, multiband compressor to control dynamic range for broadcast, mastering, and live sound.

SUMMARY. Does what it claims to do with very little audible compression effects at reasonable settings..

STRENGTHS: Lots of variable parameters for creating different effects; clean sound; solid construction; Straightforward, uncramped front panel.

WEAKNESSES: Nonprogrammable; doesn't give "vintage" compressor sounds; weak dollar against the German mark raises price.

PRICE: \$1900

EQ FREE LIT. #: 150

IF YOU WANT to fool around with squeezing dynamic range, there are lots of options, each with particular characteristics. Tube compressors give one type of sound, solid-state another. Some compressors, like the Dolby 740 spectral processor, are more like an effect; other devices take great pains to be transparent. And if you have a computer and DSP card, you can buy "plug-in" compression software (although some people will always prefer a hardware box with real knobs).

Into the fray steps the Behringer Combinator, a 2-channel, multiband compressor/limiter/leveler aimed at

the broadcast, live-sound, and mastering markets. In a nutshell, the Combinator splits the input signal into four bands (10 Hz–180 Hz, 180 Hz–750 Hz, 750 Hz–3.5 kHz, 3 kHz–20 kHz), each with its own compressor. The multiband approach reduces intermodulation problems found with single-band limiters where, for example, a loud signal can limit signals at other frequencies that don't need limiting, which produces the infamous "pumping" effect. Embellishing on this basic ideal, Behringer has bundled a "leveler" option (a "soft" automatic gain control to even out average levels) into the compressor, and a

peak limiter to handle peaks and transients. Furthermore, each of the four bands has its own in/out switch and level control so you can compress some bands and not others, as well as alter timbre.

THE INS AND OUTS

The Combinator's rear panel features balanced inputs (60 k input Z) and outputs (40 Ohms) that also work with unbalanced lines. In fact, the manual devotes three pages on how to patch to the inputs and outputs, with examples of how to make your own cables, and tips on how to eliminate hum problems. There are also three switches: +4/-10 dB operation, and two switches that select one of four different pre-emphasis/de-emphasis curves (off, 25, 50, and 75 µsecs) for broadcast application.

CONTROLS

The bypass switch is a true bypass; it will bypass even if the power is off. As with most compressors, there's a stereo/dual mono switch. Two pairs of 30-step LED meters (1 dB per step) dominate the right side of the panel. One shows the amount of gain reduction (either overall, or for one of the four bands). The other pair monitors input levels when the effect is



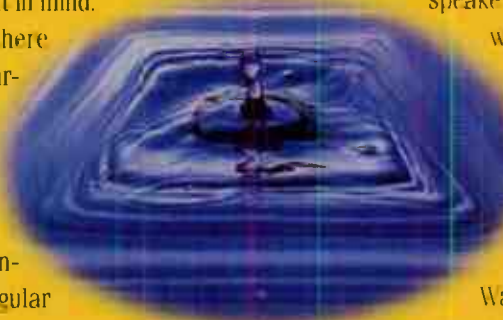
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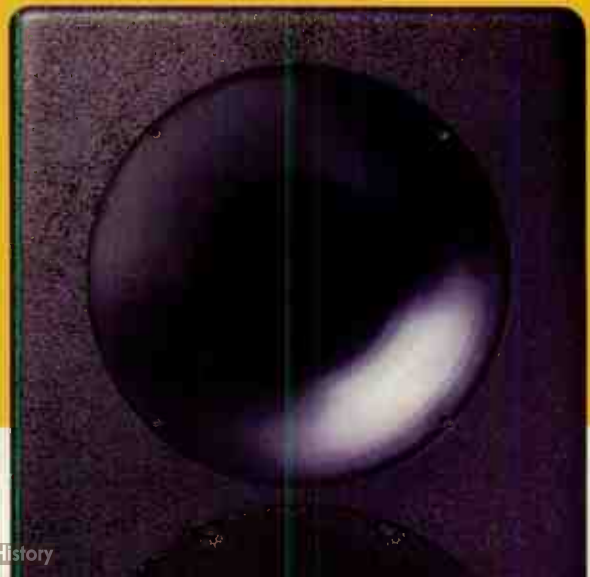
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bypassed and output levels when the effect is active.

The main compressor controls, which are "master" controls for all four stages, are the usual threshold, ratio, and output. However, there's also a Process Balance control that is continuously variable between compression and leveling. Each of the four bands has an in/out switch, \pm dB boost/cut control, and "set" switch. The latter switch routes the selected band to the gain reduction meter. If several set buttons are pushed, the meter reads the leftmost one. LEDs indicate the onset of compression and the onset of "clipping." By clipping, Behringer does not mean the stack-'o-Marshalls kind of clipping, but more of a very hard limiting process. This can result in short periods of clipping; however, if the clipping extends longer than about 20 ms, then the gain gets cut back until the distortion goes away.

The final section, the peak limiter (limiter), has a "peak ceiling" control to set the maximum output level, in/out switch, and "density" switch to adapt the decay time to different types of program material. The manual suggests that a little bit of clipping can actually improve the sound. This is a rather unorthodox concept, but I must confess that I often use light clipping on extremely short transients with Sound Tools to good effect. The Behringer works similarly. If you don't like this effect, just don't drive the unit into the clipping.

There are also LEDs by the in/out switches that glow different colors to show whether circuits are active or not.

USING IT

This is a box that you have to use on a trial-and-error basis, with a few readings of the manual behind you, to

make work. The Combinator is not programmable, and since different types of program material require different settings (I could see making adjustments between songs when using the Combinator for mastering), you need to know the unit well enough to make it perform properly. The suggested settings in the manual are a start, but it takes practice to get the sounds you want.

Because you have a lot of ways to alter dynamic range and timbre, it's very easy at first to dial in grotesque caricatures of what music should sound like. However, once you figure out how the controls interact, then you're ready to do some very tasty audio enhancements.

The sound is definitely not tube-like or vintage; there's a "sparkly" kind of ambiance that seems most at home with nonsynthesized music. With music involving lots of electronic

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sound sources, it helps to scale the settings back somewhat, and also, it was more difficult to hear much of a difference with the effect in — even though the meters showed a lot of compression.

BEND ME, SHAPE ME, SQUEEZE ME

The Combinator excels at squeezing dynamic range and retaining an open, nonclaustrophobic sound. There are a lot of times when you switch between bypass and effect and don't hear much of a difference — yet the meters indicate an obvious narrowing of the dynamic range. Preserving a decent degree of dynamics despite a much narrower dynamic range suggests uses with TV, public address systems, and other applications apart from the traditional recording studio. In a way, the Combinator is a one-trick pony, but it's a trick with a lot of variations.



The competition for the compressor market is intense, but Behringer has staked out a particular turf — and you might find that it's exactly what you need to give more punch and dynamic consistency to your recordings.

—Craig Anderton

Note: Starting in January, you can hear a recorded sample of switching the Behringer bypass and altered sounds on America OnLine. Go to "Craig Anderton's Sound, Studio, and Stage" area, then key into "FQ On Line."

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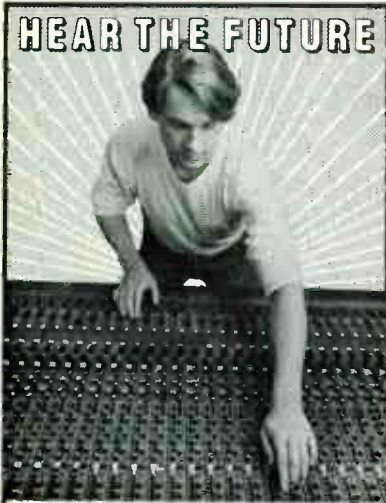
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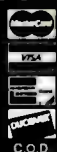
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The Big Squeeze, Part 2

A look at the tools of the compression trade

BY MARTIN POLON



Let us briefly consider the paradigm of companding and low bit-rate coding to accomplish physical data reduction of the recorded or transmitted digital audio signal. The methodology is to remove portions of the audio signal that will not be needed in the recording, storage, or transmission of the audio signal and that will, in theory, not be noticeably missing to approximately 90 percent of the music consumers. Here are some of the tools in the toolkit of the digital audio reductionist:

1. Masking — The removal from a single channel of audio information bits that are unneeded because they would be inaudible due to the masking effect of other audio information at a higher level. In other words, you are not going to hear sounds that are at a significantly lower level than other elements of the audio program information.

2. Signal Redundancy Removal — The removal of unneeded audio information bits that are surplus due to the redundancy effects of other audio information present in the data flow. In other words, if there is any redundancy of information in the audio program material, as there frequently is in

speech or music, then the unneeded bits are identified through signal analysis and removed.

3. Threshold Effect — The removal from single channels of audio information bits that are unneeded owing to human-hearing threshold minimums for the recognition of sounds. If the human ear and the human brain cannot detect the presence of audio information below the level of recognition, the information corresponding to these low level sounds is removed below that threshold of recognition.

4. Use of a Single Common Bit Pool For All Channels — The use of a common bit pool in a multichannel system minimizes the amount of extraneous information necessary to the maintenance of each channel. In plain text, in a multichannel system, it is not necessary to have the complete bit rate of X number of single-channel systems. It is only necessary to support those bits necessary for a complex matrix of the recorded multichannel signal in playback.

5. Interchannel Masking — If audio information in one channel of a multichannel system is competing for the listener's attention with one or more other channels of a multichannel system, and the difference in the listener-perceived level between channels is above the threshold of recognition, then the greater the difference in level between channels, the greater the potential for bit reduction in the lowest level channel. In plain English, the listener is distracted from the signal purity of the lowest level system channel by the program material present in the higher level channels.

6. Redundancy Coding — If audio information is common to and present in more than one channel of a multichannel system, the redundant data bits can be removed from all but the one priority channel. In other words, if program material with exactly the same content is present in more than one channel in a multichannel system, the redundant bits can be removed.

There is no question that the above tools of audio data reduction in

the digital domain represent real technological achievement. We now have a toolkit that has been developed to reduce recorded or transmitted digital signal density. Whether we can do this without "materially" or "audibly" changing the program material depends upon how judiciously we apply compression to our recorded signal and how greedy for storage and transmission space we become!

Certainly, the implementation of this technology for digital storage and transmission has already become commonplace. We also know that compression certainly can be acceptable when used for a single pass, when the quality of the entire digital electronics chain is the highest and no other similar or dissimilar implementation of coding/companding is used on the signal in question.

The need by some to make the use of reduction technology part and parcel of the future of audio in the digital/computer domain is what is questioned by many in the audio world. This is especially difficult to comprehend with the continuous gains made in recordable media and in-release media. Consider that memory systems of all kinds are dropping in price/performance ratios at the rate of 20 percent per year. By the end of 1994, we should see \$500 gigabyte drives and comparable pricing on still larger drives.

We still have digital and noise-reduced analog tape systems that have recorded literally hundreds of thousands, if not millions, of studio sessions — all without fail. The bottom line here is that we do not have to proceed with extreme haste in adopting technology that may not be appropriate for every audio application. There is no question that long-distance digital transmission has opened new studio vistas. There is also no question that multiple passes through dissimilar digital coding and companding systems have a questionable influence on the finished audio product. Let us just take our time and not "rush to judgment" for the future of digital audio.

EQ



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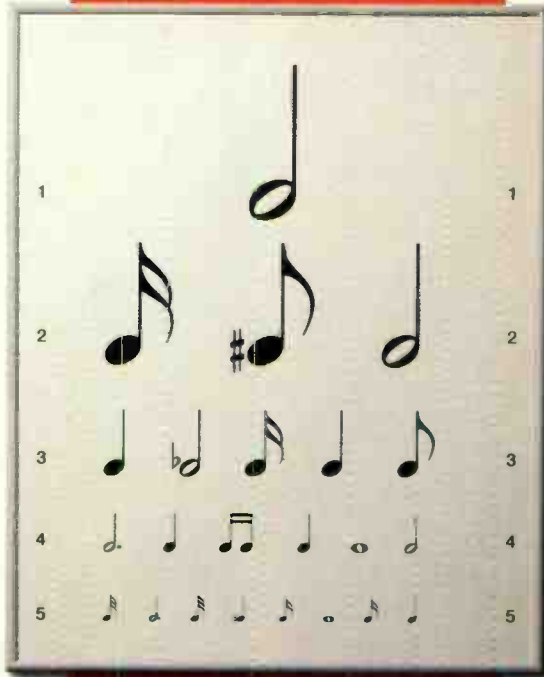
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Do your ears have a vision?



Control Room Built-In Furniture

What we see is not
always what we hear...

**BY JOHN STORYK AND
BETH WALTERS**



The state of the art in audio control room design and construction has advanced enormously during the past 20 years. There is no single set of rules for control room design; but general design-process guidelines might appear something like the following:

1. Analyze the ergonomic and programmatic requirements of the room, including staff and client work locations; equipment placement and wire management; egress (doors, access panels, etc.); vision and lighting needs (glass, etc.); and "built-ins."

2. Determine the bulk size and volume of the room. This is critical and has no easy rule-of-thumb procedure. Many factors will affect this process, including existing columns, heights, and other building constraints; budget; local construction techniques; and population requirements based on program analysis.

3. Use low-frequency axial modal analysis to determine the fundamental axial dimensions of the room — leading to the basic length, width, and height of the control room. This can be accomplished mathematically, although there are several "easy-to-use" look-up tables and picturegrams

that will simplify this process during the conceptual stages (see fig. 1).

4. Use ray trace techniques (fig. 2), energy time domain curves (ETC), and reverberation analysis (RT60) to finalize the mid- and high-frequency shapes and boundary treatments. Computer Aided Design (CAD) allows the acoustic ray tracing process to be performed quite quickly.

5. Complete the analysis of all other remaining architectural and engineering design issues that would normally be associated with any complex architectural installation.

BUILT-IN FURNITURE

There are literally hundreds of architectural and acoustical elements in a control room, yet I would submit that none is more important and discussed than the mixing console. Consoles have historically been pieces of equipment that are simply "placed" in the acoustic environment. In recent years, this has changed. Prepurchased consoles have now become built-in furniture elements. This furniture often surrounds a manufactured console or is itself the housing for an assembly of electronic components. The newer

family of digital audio workstations (DAWs) and multimedia production computers have inspired this approach to console built-in design.

Besides the traditional mixing position console, other built-ins are found in most audio control rooms.

1. These usually include numerous configurations of 19-inch-wide rack-mounted gear. Their locations will typically be to the sides and sometimes rear of the center mixing position — although they can be above tape machines and, for that matter, in even more exotic locations such as overhead surfaces.

2. Increasing numbers of video monitors are becoming standard components in the most recent audio control room configurations. Multimedia production will only increase this requirement. It is not uncommon to have up to six monitors in the audio control room, many of which will be integrated into the room's built-in furniture.

3. Client comfort and a more comfortable, ergonomically correct working environment are the design anthems of the new audio-production control rooms. Traditional recording equipment is becoming more integrat-

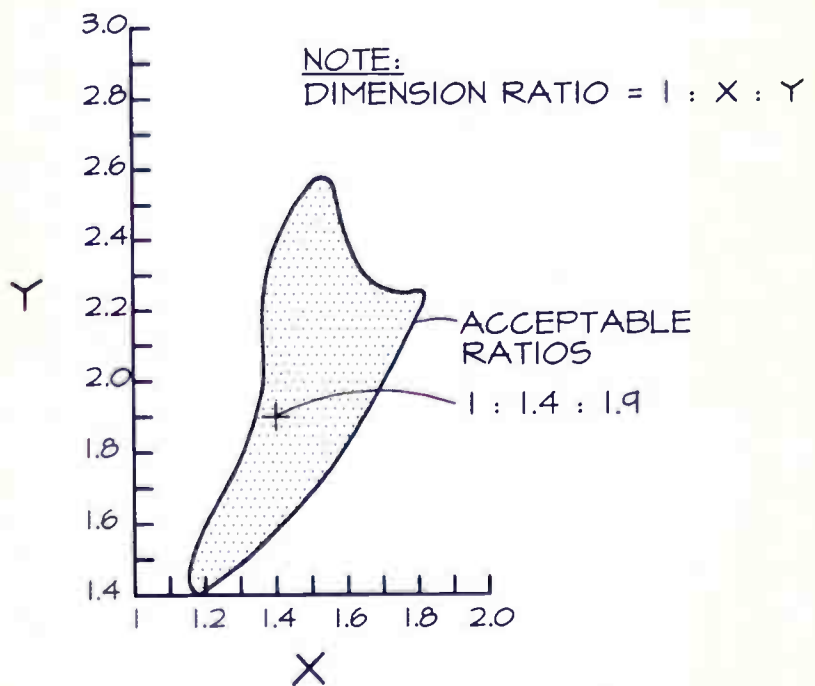


FIGURE 1: Acceptable dimension ratios diagram for good low frequency response.

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ACROSS THE BOARD

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to solve everything. I thought that was my job!

GLOBAL POSITIONING SYSTEM

How in hell is he going to work audio into a paragraph about the Global Positioning System (GPS), you ask? Well, I don't know yet, but I'll think of something.

I took a bicycle on the Steely Dan tour so that I could ride around the venues during the time between soundcheck and the show. Some of the shows were a long way from nowhere and I would ride 20 to 25 miles to places where I had no business being. The first couple of times I got lost and had to ask someone how to get back to the venue. The guy I asked for directions didn't even know what music was, let alone where Steely Dan was playing.

A bunch of companies make hand-held GPS receivers with built-in moving map displays. They make models for boating and models for flying. The boating versions contain a database of all the navigable (I like that word) waterways, with lighthouses,


buoys, channels, obstacles, marinas, and Jack in the Box restaurants. The flying version contains all airports with runways over 1000 ft., VORs (very-high frequency omnidirectional radio ranges), NDBs, airways, intersections, and special-use airspaces. Because I fly, I bought the flying version of the Garmin 95 XL. It comes with a mount that connects to the yoke (steering wheel) of an airplane. It also works fine as a bicycle mount. At the next venue, which was Irvine Meadows (south of Los Angeles), I programmed in the location of the venue (you push one button that says "start here") and then pedaled off into the sunset. As you move away from your starting point, the GPS unit tells you how far you have gone, how fast you are going, and which way to turn to get back. On the way back, the GPS receiver tells you when you are within ten minutes of your destination and when you have arrived. If you get really lost, the press of a button will instantly show the location of the nearest airport (remember, I said this was meant for flying).

Sony makes a GPS unit called the Pyxis 760 that allows you to plug in different database cards. You can change the flying version to a boating version

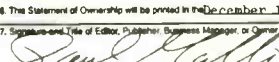
just by changing database cards. In Japan last Spring, I saw database cards for the Sony that contained street information for Tokyo. I imagine that they will be available for other cities soon.

Where does the audio reference come in? Right here. I want to volunteer to put together the database card for audio-related products. How about a moving map display that had all the pro audio dealers, all the venues, and all the clubs, plus recording studios listed by console type and fast food restaurants? If you were hurtling across the country in your tour bus and a hit song was right on the tip of your tongue, one quick press of a button and the nearest five studios with digital multitrack machines would pop into view with directions and distances.

WINDING DOWN

Well I have to run to catch my plane to China. If it were EQ Airlines, they might at least consider waiting for me, but United won't. Maybe I'll bring along my GPS unit just to make sure we don't stray over North Korean airspace on the way to Singapore. If you get one of those "Help, I am being held prisoner in a Chinese fortune cookie factory" messages, please come and get me. 

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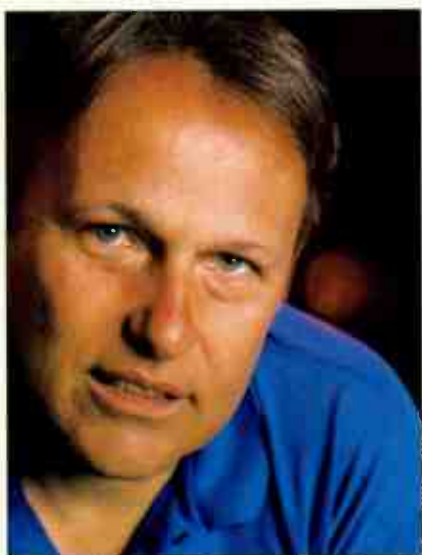
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Egg Too Young & Other Wisdoms



A funny thing
happened on the way
to China...

BY ROGER NICHOLS

Here we go again. I just got home from the Steely Dan tour and I am off to another part of the world. I am leaving in the morning on a 23-1/2-hour plane trip from Nashville to Singapore. I will spend two days in Singapore, two days in Hong Kong, and then fly 19 hours back to Nashville. At first I was going to tell you that I was having a craving for 1000-year-old eggs, but I don't have time to wait for them.

Actually, I am going to an audio

seminar called Musitechnic. I am on a panel that will be discussing techniques for recording digitally. I am not sure whether Musitechnic is like an AES show, with exhibits, or is just seminars. I guess I'll find out tomorrow.

NOISE REDUCTION HEADPHONES

I have told you in the past about the Bose ANR (Active Noise Reduction) headset. We used them last year to shut out the hall reverb from a drummer. The Bose headset was amazing, but cost around \$900. At Sharper Image, I picked up a pair of Noise Buster headphones that cost only \$150 and work almost as well. I bought them to use on long airline flights to shut out some of the jet roar that makes you want to open the door and get out after five or six hours of exposure. If you want listen to something besides quiet, they come with a cord that lets you plug into the airplane audio system or your Walkman. (I have heard some CDs that I wish the Noise Busters would cancel out.) Sony makes a version that is being passed out to passengers on Japan Air Lines for noise reduction.

DIGITAL LIMITERS

Symetrix has a digital domain stereo limiter/compressor/gate/de-esser/EQ/kitchen sink (model 602) that Masterfonics [Studios] has tried out and seems to like. I was told that Valley Audio has a similar unit available. t.c. electronic has a software upgrade for the M5000 that includes multiband limiting and compression. I have tried the M5000 and it works great. If you are transferring between two digital audio devices and don't care about a little delay, then you can get zero attack time. Pretty soon it'll be possible to decode Dolby tapes in the digital domain. Actually, I have heard that it has been done — it's just that Dolby won't license anyone to do it. I have had tapes transferred to digital without being Dolby decoded and then the original masters were discarded. The only way to unDolby them was to go back to analog, through the Dolby, and then redigitize them. Oh yeah, once I got a tape where Dolby had been encoded the DAT tape. It was done

because the record company demanded that *all* two-track mixes be Dolby encoded. I guess that will teach them.

CONSOLES

Masterfonics in Nashville just installed a Harrison Series Twelve console with 96 inputs. The Series Twelve is a digitally controlled analog console. The audio stays in the machine room while only the control surface is located in the control room. The clients who were using the console usually brought a rack full of esoteric outboard mic preamps to the tracking session, but after listening to the Series Twelve mic preamps they changed their minds.

Another feature that Masterfonics included was a completely automated patchbay. They figured that they usually have over 400 patch points available during a session, so they asked if Harrison could build a 512-by-512 patch matrix. Masterfonics stipulated that all 512 inputs must be routable to any of the 512 outputs. Harrison built it, and it pretty much fills up the entire machine room at Masterfonics. They said that it took over three miles of ribbon cable to interconnect all the cross-point modules. Talk about a cable bill at the end of the month.

On the other end of the spectrum, Tactile Technology in Orange County, California, will be showing the latest version of its digitally controlled analog console at this year's AES show. Its console is targeted toward the project studio owner who wants to buy a new high-tech console and still be able to afford rent and food.

UGLY RUMOR

I heard that Apple Computer announced that it will be discontinuing all computers with NuBus slots. This means that there will be no place to plug in your Pro Tools boards. This means there will be no more slots for Sample Cell. Tell me this is not true. Just when Mac computers were coming down to a reasonable price that put them in a better position against all the IBM compatibles, along comes some idiot who thinks he knows how

continued on page 168

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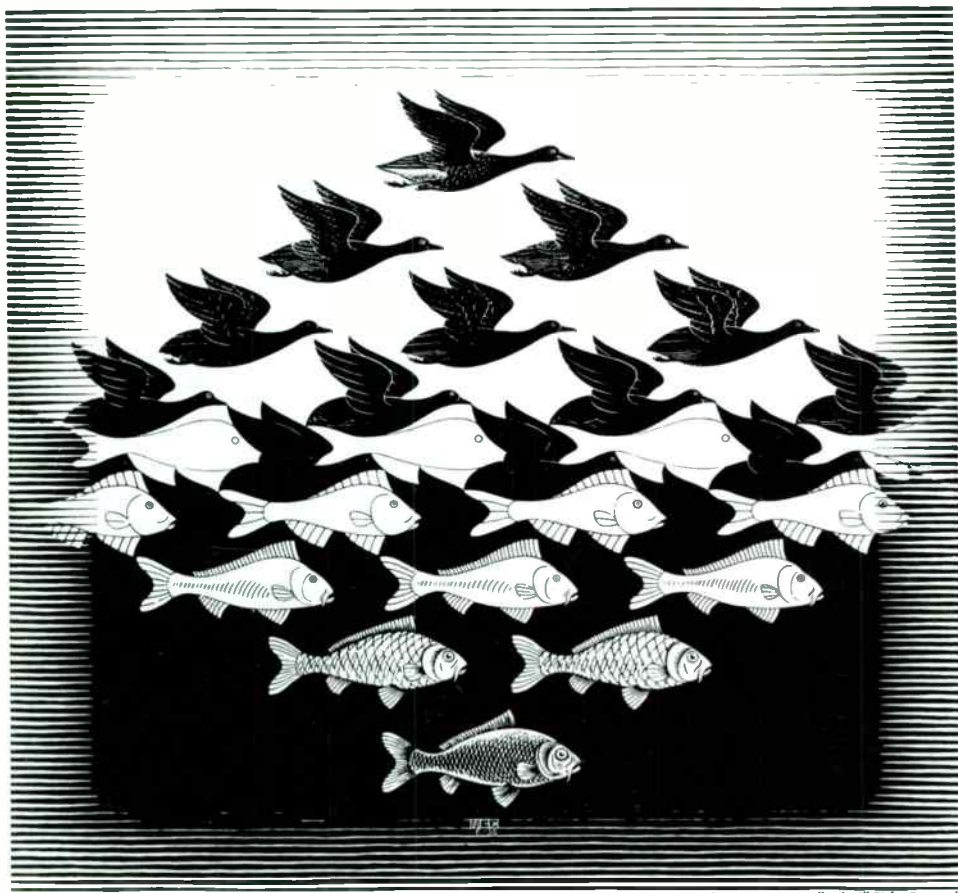
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CIRCLE 27 ON FREE INFO CARD

If you think only your eyes can play tricks on you...



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Study the illustration. Are the geese becoming fish, the fish becoming geese, or perhaps both? Seasoned recording engineers will agree that your eyes *and* your ears can play tricks on you. In the studio, sometimes what you think you hear isn't there. Other times, things you don't hear at all end up on tape. And the longer you spend listening, the more likely these aural illusions will occur.

The most critical listening devices in your studio are your own ears. They evaluate the sounds that are the basis of your work, your art. If your ears are deceived, your work may fall short of its full potential. You must hear everything, and often must listen for hours on end. If your studio monitors alter sound, even slightly, you won't get an accurate representation of your work and the potential for listener fatigue is greatly increased.

This is exactly why our engineers strive to produce studio monitors that deliver sound with unflinching accuracy. And, why they create components designed to work in perfect harmony

with each other. In the laboratory, they work with quantifiable parameters that do have a definite impact on what you may or may not hear.

Distortion, which effects clarity, articulation, imaging and, most importantly, listener fatigue.

Frequency Response, which measures a loudspeaker's ability to uniformly reproduce sound. *Power Handling*, the ability of a

loudspeaker system to handle the wide dynamic range typical of the digital domain. And, finally, *Dispersion*, which determines how the system's energy balance changes as your listening position moves off axis.

The original 4400 Series monitors have played a major role in recording and broadcast studios for years. Today, 4400 Series "A" models rely on low frequency transducers with Symmetrical Field Geometry (SFG™) magnet structures and large diameter edgewound ribbon voice coils. They incorporate new titanium dome tweeters, oriented to create "Left" and "Right" mirror-imaged pairs. Refined crossover networks use conjugate circuit topology and tight tolerance components to give 4400A Series monitors absolutely smooth transition between transducers for perfect imaging and unparalleled power response.

If you're looking for a new pair of studio monitors, look into the 4400A Series. We think you'll find them to be a sight for sore ears.



Models pictured (L-R)
3-Way 10" 4410A, 2-Way 8" 4408A and 3-Way 12" 4412A



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